Washington Center for Equitable Growth
Evidence for a stronger economy

equitablegrowth.org

Working paper series

Who Cares if Parents have Unpredictable Work Schedules?: The Association between Just-in-Time Work Schedules and Child Care Arrangements

Kristen Harknett
Daniel Schneider
Sigrid Luhr

October 2019

https://equitablegrowth.org/working-papers/who-cares-if-parents-have-unpredictable-work-schedules-the-association-between-just-in-time-work-schedules-and-child-care-arrangements/

facebook.com/equitablegrowth
@equitablegrowth
equitablegrowth.org/feed
info@equitablegrowth.org

1156 15th St NW Suite 700
Washington DC 20005
202-545-6002

Who Cares if Parents have Unpredictable Work Schedules?: The Association between Just-in-Time Work Schedules and Child Care Arrangements

Kristen Harknett, University of California, San Francisco*

Daniel Schneider, University of California, Berkeley

Sigrid Luhr, University of California, Berkeley

* Kristen Harknett (Corresponding author): University of California, San Francisco, Department of Social and Behavioral Sciences, 3333 California Street, San Francisco, 94118; kristen.harknett@ucsf.edu. We received excellent research assistance from Carmen Brick, Josh Choper, Paul Chung, Megan Collins, Veronique Irwin, and Adam Storer. We received helpful feedback from Elizabeth Ananat, Ryan Finnigan, Anna Gassman-Pines, Jennifer Glass, Taryn Morrissey, Natasha Pilkauskas, Pilar Gonalons-Pons, and at the 2019 annual meeting of the Population Association of America and Duke University's Center for Child and Family Policy seminar series. Support for this research was provided by the National Institutes of Child Health and Human Development (R21HD091578), the William T. Grant Foundation (Award 188043), the Russell Sage Foundation (Award 77-18-05), the Robert Wood Johnson Foundation Pioneering Ideas program (Award No. 74528), the Robert Wood Johnson Foundation's Policies for Action program (Award 75494), the U.S. Department of Labor (Award No. EO-30277-17-60-5-6), the Washington Center for Equitable Growth (Award No. 39092), the Ford Foundation (Award 0000000834), the Institute for Research on Labor and Employment, and the Berkeley Population Center. The views expressed here do not necessarily reflect the views of the funders.

Who Cares if Parents have Unpredictable Work Schedules?: The Association between Just-in-Time Work Schedules and Child Care Arrangements

Abstract

Working parents must arrange some type of care for their young children when they are away at work. For parents with unstable and unpredictable work schedules, the logistics of arranging care can be complex. In this paper, we use survey data from the Shift Project, collected in 2017 and 2018 from a sample of 3,653 parents who balance work in the retail and food service sector with parenting young children 0 to 9 years of age. Our results demonstrate that unstable and unpredictable work schedules have consequences for children's care arrangements. We find that parents' exposure to on-call work and last-minute shift changes are associated with more numerous care arrangements, with a reliance on informal care arrangements, with the use of siblings to provide care, and with young children being left alone without adult supervision. Given the well-established relationship between quality of care in the early years and child development, just-in-time scheduling practices are likely to have consequences for child development and safety and to contribute to the intergenerational transmission of disadvantage.

Introduction

The quality and stability of child care arrangements have important implications for child development and wellbeing (Bratsch-Hines, Mokrova, and Vernon-Feagans 2015; Shonkoff and Phillips 2000; Vandell et al. 2016). Stable and consistent child care arrangements such as those offered in high-quality school- or center-based care settings have been found to have a host of benefits for children's cognitive and socioemotional development (Camilli et al. 2010; Loeb et al. 2004; McCoy et al. 2017; NICHD Early Child Care Research Network 2002; Shonkoff and Phillips 2000). However, access to this type of stable and high-quality care is sharply stratified by socio-economic status, race and ethnicity, and geographic location (Crosnoe et al. 2016; Gould, Austin, and Whitebook 2017; Schmit and Walker 2016).

Many low-income parents face barriers to arranging stable, high-quality child care because of costs (Henly and Lyons 2000; Rachidi 2016; Sandstrom and Chaudry 2012), or because their work schedules are misaligned with the times that formal, high-quality child care is typically available (Chaudry et al. 2011; Henly and Lyons 2000; Rachidi 2016; Usdansky and Wolf 2008). Some working parents face another significant barrier to stable, high-quality child care arrangements: they experience routine uncertainty about the times that they will be required to work. In the service sector, which we take as our focus, the majority of workers contend with routine uncertainty in their schedules because of just-in-time scheduling practices that offer workers little notice of when they will be expected to work (Henly et al. 2015; Henly, Shaefer, and Waxman 2006; Schneider and Harknett 2019a). In this paper, we focus on two types of "just-in-time" scheduling: *on call* shifts, in which workers must be prepared to come to work if asked but usually not paid otherwise, and *last-minute changes* to work schedules such as earlier or later starting or stopping times (Schneider and Harknett 2019a). Parents contending with just-in-time

work schedules are likely to have to arrange just-in-time child care to match. This may raise children's risk of exposure to unstable and low-quality care.

However, our knowledge of the association between such just-in-time scheduling practices and child care arrangements is limited because few data sets capture detailed information on both work scheduling and care arrangements. To fill this gap, this paper takes advantage of survey data from the Shift Project to examine how uncertain work schedules influence child care complexity and type. We focus on the large retail and food service sector, which comprises 17% of jobs in the American economy and employs the parent of 1 in 10 American children (Author's Calculations from the American Community Survey). This focus is strategic because just-in-time scheduling practices are prevalent in this sector and low wages mean that working parents have few resources with which to cope with schedule uncertainty. Further, although just-in-time scheduling is prevalent in retail and food service jobs, it is not universal. This allows for comparisons between hourly service sector workers who face the added challenge of just-in-time scheduling when arranging for child care for their young children and their counterparts who have more predictable work schedules.

Our paper tests a set of interrelated hypotheses about work schedules and care arrangements. We hypothesize that working parents who are subject to just-in-time work schedules will need to rely on a larger set of child care arrangements to cover all schedule contingencies. We also expect that just-in-time work schedules will lead parents to rely more heavily on informal sources of child care including grandparents, friends, or babysitters. These unpredictable work schedules could increase parents' reliance on young children's siblings to provide care and perhaps increase the chance that young children are left unsupervised. Our research finds support for each of these hypotheses.

Prior Research

The stability and quality of child care arrangements is known to be important for young children's development (Guinosso et al. 2016; Loeb et al. 2004; Mortensen and Barnett 2015; Shonkoff and Phillips 2000), and work schedules play a central role in enabling or precluding particular types of care arrangements. Research shows that within the low-wage labor market, jobs schedules can be erratic, with some employers using "just-in-time" scheduling practices in which work shifts are assigned or altered with very little advance notice (Henly et al. 2006; Scott and Abelson 2016). These practices are designed to match the labor supply to consumer demand (Lambert 2008; Williams, Blair-Loy, and Berdahl 2013). Just-in-time schedules are common practice in the retail and food service sectors (Henly and Lambert 2014; Schneider and Harknett 2019a).

Young dependent children's time is closely intertwined with their parents' time, and unpredictability in a parents' work schedule has spillover effects for their young children's care schedule and conditions. Below, we review theory and research on how the timing of work may affect the number of care arrangements a child experiences, reliance on informal care arrangements, reliance on siblings for care, and leaving children alone without supervision.

Number of Care Arrangements. Stable and consistent child care arrangements are an important component of supporting healthy child development. Stable care arrangements allow children to form more stable attachments with caregivers (Shonkoff and Phillips 2000; Bratsch-Hines et al. 2015) and are positively related to social competence (NICHD Early Child Care Research Network 2005), behavioral outcomes (Huston, Chang, and Gennetian 2002), cognitive outcomes (Loeb et al. 2004), language development (Tran and Weinraub 2006), school adjustment (Bratsch-Hines et al. 2015), and overall child wellbeing (de Schipper et al. 2003).

Yet, roughly one-fifth of children under the age of 5 in the United States are regularly in more than two child care arrangements (Laughlin 2013). Among children with employed mothers, more than one-fourth are regularly in multiple arrangements (Laughlin 2013). Multiple arrangements have negative effects on children's social adjustment and school readiness (Bratsch-Hines et al. 2015; de Schipper et al. 2004; Sandstrom and Huerta 2013), can interrupt the formation of routines (Morrissey 2009), and impede the formation of secure attachments with caregivers (Sandstrom and Huerta 2013), all of which can contribute to increases in child stress and health problems (de Schipper et al. 2004; Morrissey 2009). Multiple care arrangements are particularly detrimental for very young children (Cryer et al. 2005; Morrissey 2009). Multiplicity in child care arrangements at the age of 3 is associated with both externalizing and internalizing behaviors (Pilarz and Hill 2014). While some shifts in child care arrangements can be positive for children (Howes 2011; Pilarz and Hill 2014), those that are unpredictable or abrupt can be particularly disruptive (Sandstrom and Huerta 2013).

Much of the research on the topic of work schedules and child care focuses on nonstandard work (Presser 1988; Prickett 2016; Rachidi 2016; Usdansky and Wolf 2008). In her work on the 24/7 economy, Presser (2003) finds that parents working rotating or variable shifts are more likely to rely on a complex patchwork of care arrangements. This finding is echoed in a number of other studies using a variety of data sources, including the 1987 National Survey of Families and Households (Folk and Yi 1994), the Survey of Income and Program Participation (Laughlin 2013), and the 2012 National Survey of Early Care and Education (Hepburn 2018). In qualitative research, Scott, London, and Hurst (2005) describe the "unstable patchwork" of care arrangements used by mothers moving from welfare to work, whose jobs involve odds hours that change from day to day.

The uncertainty introduced by just-in-time scheduling practices may also contribute to a more complex patchwork of care arrangements. However, few empirical studies specifically examine how just-in-time scheduling practices affect child care arrangements. Rare direct evidence of the connection between just-in-time scheduling practices and unstable and complex care arrangements comes from a qualitative study of 54 low-wage, working mothers employed in retail in Chicago from the Study of Work–Child Care Fit (Henly and Lambert 2005). This study describes the challenges that the working parents in the study faced in piecing together care at the last minute or just in case they were called in to work. Another qualitative study by Carrillo et al. (2017) similarly reports that parents working in jobs with unstable and unpredictable work schedules, and especially on-call shifts, are far more likely to "scramble" to arrange care than those with stable, even if nonstandard, shifts. To date no quantitative data has been available to empirically test this relationship at a national level.

Informal Child Care Arrangements. Children benefit cognitively and socioemotionally from the stability and quality of formal care arrangements (Shonkoff and Phillips 2000; Vandell et al. 2016). Formal, center-based care settings are more likely to follow developmentally appropriate care guidelines, whereas informal care settings are more variable in their quality and lower quality on average (Coley et al. 2016; Galinsky et al. 1994; Henly and Lyons 2000). Yet many children, especially infants and toddlers under the age of four, are cared for in informal settings (Loeb 2016). Formal care is particularly limited in low-income neighborhoods and inaccessible for low-income parents (Chaudry 2004; Henly and Lyons 2000; Queralt and Witte 1998; Rachidi 2016). As a result, low-income working parents frequently use grandparents, other relatives, friends, or other informal care providers (Carrillo et al. 2017; Henly and Lyons 2000; Hofferth and Collins 2000;

Liu 2015). These informal child care providers play a critical role in helping parents align their work schedules with their children's needs (Brady 2016; Loeb 2016). Although informal providers may provide greater flexibility (Usdansky and Wolf 2008), they can also be inconsistent and unreliable (Henly and Lyons 2000).

Many researchers point out that low-income families are more likely to have nonstandard work schedules that conflict with child care centers' hours of operation (Henly and Lyons 2000; Henly and Lambert 2005; Hsueh and Gennetian 2011; Lowe et al. 2005; Lowe and Weisner 2006; Rachidi 2016; Scott and Abelson 2016). These schedules can constrain child care options and increase the use of informal care (Henly and Lyons 2000). Many studies find a relationship between non-standard work schedules and informal child care (Morrissey 2017; Presser 1989). Using longitudinal data from the National Institute of Child Health and Human Development Early Child Care Research Network, Han (2004) finds that mothers with nonstandard schedules are more likely to rely on informal relative care. Using data from the Fragile Families and Child Wellbeing Study, Rachidi (2016) finds that unmarried mothers working nonstandard schedules are more likely to use relative care than mothers working standard schedules (47.7% v. 32%).

As with non-standard work schedules, just-in-time work schedules may also increase parents' reliance on informal care arrangements because formal, center-based care typically requires some advance notice of when care is needed, may be unable to provide last-minute care, and may charge penalties for cancelling care at the last minute.

Sibling care. Young children who are placed in the care of siblings may experience low quality care if older siblings lack the maturity, experience, and judgement to provide safe and stimulating care for an infant or young child. Recent census estimates suggest that 3% of children under the

age of 5 in the United States are regularly cared for by their siblings (Laughlin 2013). In a study using data from low-income, welfare recipient families, researchers find that 16% - 27% of parents asked an adolescent child to care for a younger sibling in the past month (Hsueh and Gennetian 2011). A 2018 study using nationally representative time diary data found that 30% of adolescents with a younger sibling provide some type of care on a given day, including care while a parent is at home (Wikle, Jensen, and Hoagland 2018).

Researchers have raised concerns about the consequences of sibling care for both the younger child who is being cared for and the older sibling caregiver. Morrongiello and colleagues (2010) find that sibling care is associated with an increase in risk-taking and accidents. Hafford (2010) cautions that, "Sibling caretakers often develop their own methods to coerce cooperation and to manage the behavior of children in their care, and may resort to harsher disciplinary modes than adult caregivers" (p. 393). Concerns about sibling care also emerge in the literature on adultification (Burton 2007; Hooper et al. 2015), which describes how low-income children are thrust into adult roles. Researchers argue that the responsibility of taking care of younger siblings can negatively affect older children, especially in school (East and Weisner 2009; East and Hamill 2013; Gennetian et al. 2002; Hafford 2010; Hsueh and Gennetian 2011). Prior research finds that girls forgo educational opportunities to take on adult responsibilities (Dodson and Dickert 2004), and that adolescents who often provide sibling care are 4 times as likely to miss school compared with adolescents who rarely provide sibling care (East and Hamill 2013).

Sibling care tends to be more common in households where parents – and especially mothers – are employed (Casper and Smith 2004; Crouter et al. 2001; Gennetian et al. 2002; Hsueh and Gennetian 2011; Vandivere et al. 2003; Wikle et al. 2018) and in low-income households (Blair 1992; Dodson and Dickert 2004; Ruiz-Casares et al. 2018; Vandivere et al. 2003).

Schedule type may affect the use of sibling care. According to census reports, sibling care is more common when parents work non-day shifts compared to day shifts (Laughlin 2013). While we are not aware of any prior research that examines the question directly, there are good reasons to suspect that the uncertainty introduced by just-in-time work schedules may push parents to rely on children to care for younger siblings. For a parent who is called in at the last-minute or asked to be on-call for work, children are likely to be a free and accessible source of child care for young siblings. Older children may also provide a convenient fall back option or last resort when other care providers are not available on short notice.

Young Children without Care. In the absence of other child care options, some children are left alone while their parents are at work. Eleven% of children between the ages of 5-14 are left in unsupervised self-care (Atherton et al. 2016; Laughlin 2013). While self-care is more common among older children (Laughlin 2013; Lopoo 2005), it is routinely used as a form of care for younger children as well (Laughlin 2013). About 5% of elementary school children between the ages of 5 and 11 are in self-care for some time during a typical week, including 2% of children aged 5 or 6 (Laughlin 2013). One study finds that 5% of 6 to 9 year olds use self-care as their primary child care arrangement while their parents are at work (Capizzano, Tout, and Adams 2000).

Leaving children in self-care raises a number of immediate and long-term concerns, ranging from risk of injury to poor social and intellectual development (Heymann 2006; Kerrebrock and Lewitt 1999; Vandivere et al. 2003.). Unintentional injuries are the leading cause of death among children (Morrongiello, Klemencic, and Corbett 2008; Ruiz-Casares et al. 2018) and, for children under 6, the greatest risk of injury is at home (Rivara 1995; World Health Organization 2008). When child injuries occur, lack of supervision is often cited as a primary

contributing factor (Saluja et al. 2004; Schnitzer et al. 2015; World Health Organization 2008). Beyond the immediate risk of injury, researchers find that self-care offers fewer developmental benefits than more structured after-school care (Boyd-Swan 2019; Granger 2009; Mahoney and Parente 2009; Park and Zhan 2017; Roche et al. 2007). Studies of first and third grade children find that self-care is related to lower levels of social competence and academic achievement (Vandell and Corasaniti 1998; Pettit et al. 1997). Other studies find that self-care is associated with behavioral problems (Atherton et al. 2016; Levesque 2016), higher levels of depression (Venter and Rambau 2011), and negative academic outcomes (Levesque 2016).

While some parents allow their children to spend time unsupervised by choice, especially as their children grow and mature, the use of self-care is also related to parents' labor force participation (Casper and Smith 2004; Lopoo 2005; Presser 1998). Among children aged 5 to 11 years, twice as many with employed mothers are regularly in self-care (14%) compared with children whose mothers are not employed (7%) (Laughlin 2013). While having a working mother doubles the use of self-care, the effect of work schedules on self-care is still not well understood. A small number of studies examine the role of nonstandard work hours on self-care and find self-care to be more common when mothers work during the day (Capizzano et al. 2000; Laughlin 2013), perhaps because of tag-team arrangements are possible for those who work stable nonstandard hours (such as night shifts) (Capizzano et al. 2000). Just-in-time scheduling practices, in contrast, are unpredictable by definition, making it difficult for parents to plan for care. This could result in increases in children's self-care.

Hypotheses. Prior research provides strong evidence that complex child care, informal child care, child care provided by siblings, and self-care have negative consequences for the wellbeing and

healthy development of young children. Yet, we know very little about how just-in-time scheduling practices affect child care arrangements, because until recently no national data has been available. To fill this gap in the literature, our paper examines a set of hypotheses about how just-in-time work scheduling affects child care arrangements.

We expect that working parents subject to just-in-time scheduling practices will need to rely on a larger set of child care arrangements for their young children to cover all schedule contingencies. The schedule uncertainty introduced both by on-call schedules and by last-minute scheduling changes can be expected to increase reliance on informal sources of child care including spouses, grandparents, and babysitters. We also predict that just-in-time work schedules will be associated with greater reliance on young children's siblings to provide care as well as young children being left alone. Because formal care arrangements tend to be more rigid in the requirements for notice and more limited in their hours of service, we do not expect just-in-time schedules to increase reliance on formal daycare or school-based care arrangements.

Data and Methods

Between 2016 and 2018, the Shift Project collected survey data from approximately 60,000 workers employed in the retail and food service sectors across the United States. The sample is composed of workers employed at 124 of the largest retail or food service employers in the United States and includes workers aged 18 years and older. This paper restricts the Shift sample to 3,653 working parents caring for dependent children between 0 and 9 years of age, who were surveyed in 2017 or 2018 when all relevant survey questions were included. Because this paper examines child care arrangements, we select the 0 to 9 year age range so as to focus on children who would typically require supervision from a parent or other caregiver. Working parents of young children

represent about 14% of the Shift Project survey sample, and the remainder of the Shift Project sample includes parents with children age 10 or older and non-parents. All of these working parents are employed in the retail or food service sector in jobs that are paid by the hour.

The Shift Project recruited this sample of retail and food service workers using Facebook targeted advertisements that led respondents to an online Qualtrics survey. Facebook serves as both the sampling frame, providing targeting information to identify workers employed at the 124 firms, and the recruitment mechanism, delivering targeted survey recruitment advertisements. This approach enables the construction of a large database of survey responses from workers employed in industries that often use just-in-time work scheduling practices.

While nearly 80% of Americans age 18-50 are active on Facebook (Greenwood, Perrin, and Duggan 2016; Pew 2018), there is likely selection into actually taking the survey. Indeed, in the full Shift sample of service sector workers, the Facebook ad appeared 5,024,362 times (including multiple times for some users), resulting in 337,098 clicks through to the survey and 60,409 individuals contributing survey data. In all, 1.2% of all ad displays yielded survey data. To address the research questions at hand, we narrow this resulting sample to the 3,653 parents in the sample caring for dependent children between the ages of 0 and 9.

This response rate is significantly lower than that achieved by leading non-governmental survey firms, such as Pew. However, it is important not to overstate the difference – Pew currently reports a 6% response rate to their telephone surveys (Kennedy and Hartig 2019). One way to gauge potential bias in the Shift data is to compare univariate statistics and associations between the Shift data with subsamples from gold standard probability samples (the Current Population Survey and the National Longitudinal Survey of Youth), selected to align with the Shift data on occupation and industry. Such analyses find that the Shift survey data yields estimates of wages,

tenure, and the wage/tenure relationship that are closer to each of the two probability samples than the probability samples are to one another (Schneider and Harknett 2019b). Additional Shift data checks are reported in Schneider and Harknett (2019b).

Dependent variables. We analyze eight dependent variables that capture the number of child care arrangements and the types of care providers. Each of these dependent variables is derived from a survey question that asks respondents to report on: "In a typical week, how often do you usually use each type of child care for your youngest child?" Possible response categories are: (1) My spouse or partner, or my child's other parent, (2) Child's grandparent or other relative, (3) Sibling, (4) Child cares for self, (5) Babysitter, or (6) Daycare center, school-based program, or Head Start. For each of these six types of care arrangements, respondents report whether they use the arrangement 5-7 days per week, 2-4 days per week, 1 day per week, or never in a typical week.

We measure the number of care arrangements by tallying parent reports of types of care arrangements. For this tally, we do not count resident parents who provide care, but we do count non-resident parents in the tally of care providers when the parent selected the category "My spouse or partner, or my child's other parent" and separately indicated that they were not living with a spouse or partner. Our measure of number of types of care is likely to underestimate care complexity, because some categories such as "grandparent or other relative care" may include more than one different care provider but only contribute 0 or 1 to the tally of types of care. This potential underestimation is a data limitation, and the average number of care arrangements should be interpreted with caution.

For each of the six care types, we create 0/1 dichotomous measures for any spouse care; grandparent or relative care; babysitter care; sibling care; child self-care; or formal daycare/school-based care. We also create a seventh composite measure that captures children being left without

supervision from someone who is at least 10 years of age. This seventh measure, which we label "Sibling less than 10 or self-care" is coded 1 if a parent reports using sibling care *and* the sibling caretaker is younger than 10 years of age, or if the parent reports that the child cares for himself or herself.

We also measure the amount of care of each type in a typical week as the average number of days of care provided by spouses, grandparents or other relatives, babysitters, siblings, children caring for themselves, sibling less than 10 years of age or self-care, or formal daycare or school-based care. We code response categories of "never" used type of care as 0, "1 day" as 1, "2-4 days" as 3, and 5-7 days as 6. We code midpoints of intervals to approximate days of care per week.

Key independent variables. The primary independent variables are two measures of just-in-time work scheduling: working on-call shifts and experiencing last-minute work scheduling changes. We refer to these two measures collectively as "just-in-time scheduling."

Our measure of on-call work schedules is based on responses to a question that asks, "In the past month or so, have you ever been asked to be "on-call" for work at [EMPLOYER NAME]? By "on-call", we mean you have to be available to work, and you find out if you are needed to work just a few hours before your shift." Parents who respond "yes" are coded 1 and those who respond "no" are coded 0.

Our measure of last-minute work scheduling changes is based on affirmative responses to a question that asks about last-minute changes to work shifts. Respondents are asked, "In the past month or so, did your employer ever change the timing or the length of your scheduled shift at [EMPLOYER NAME]? For example, your employer asked you to come in early or late, or asked you to leave early or to stay later than the hours you were originally scheduled for." Parents who report experiencing last-minute changes in the past month are coded 1 and parents who did not

experience such changes are coded 0. We note that in a separate follow-up question, 75% of respondents said this change occurred with less than 24 hours' notice.

Control variables. One set of control variables measures job characteristics, including hourly wages, usual weekly work hours, the amount of advance notice of work schedules, whether the parent works a variable schedule or a regular daytime, evening, or night shift, whether the employer or the worker control the start and end times of work, job tenure, and whether the parent identifies as a manager.

A second set of control variables measures parent and child characteristics including parents' age; whether parent lives with a spouse or partner; parents' race or ethnic self-identification, educational attainment, and school enrollment; whether parent has more than one child, and the age of the youngest (focal) and the oldest child. We also control for household resources including household income and perceived ability to cope with a $400 expense shock. Finally, we include a control for month of interview to account for seasonal variation in work schedules and child care needs.

Methods. We estimate the relationship between just-in-time scheduling practices and child care arrangements using OLS regression to model the number of care types and linear probability models to model the probability of using a particular type of care. To better isolate the relationship between just-in-time schedule exposure and child care outcomes, each of these models controls for worker, household, and job characteristics. We present regression coefficients in Table 2. We then estimate predicted values of number of types of care and predicted probabilities of using each type of child care for parents with and without exposure to on-call scheduling and last-minute scheduling changes.

The sample design as well as the extensive control variables account for some types of selection that could bias the estimated relationships between just-in-time work schedules and child care arrangements. We further address selection using a propensity score weighting approach known as inverse probability of treatment weights. In the first stage we regress an indicator of just-in-time scheduling exposure (defined as either working on-call or experiencing last-minute schedule changes) on a detailed set of child, parent, and job characteristics, then estimate predicted probabilities of just-in-time exposure given observed values of covariates. We then construct weights that are the inverse probability of "treatment" where treatment is exposure to just-in-time schedules. Those who are in the treated group receive a weight value that is the inverse of the probability of treatment (being exposed to just-in-time schedules). Their counterparts who are not in the treated group are assigned a weight value that is the inverse of the probability of not being treated (not being exposed to just-in-time schedules). When these weights are applied, the observed selection mechanisms are parceled out and the residual relationship between just-in-time schedules and child care arrangements is purged of the influence of selection on observables.

Finally, we examine the relationship between on-call shifts or last-minute schedule changes and the number of days of each type of child care working parents use in a typical week. Our measures of number of days per week of each care type take on values of 0, 1, 3, or 6 days. Although our measure of days of child care is not truly continuous, we present results from OLS regression models for ease of interpretation. The regression coefficients from these models approximate the change in the number of days of care per week associated with on-call work or last-minute schedule changes. To test the robustness of our findings, we estimate a parallel set of models using ordered logistic regression, which yield results that are consistent in their sign and

consistent (or stronger) in their statistical significance. The ordered logistic regression results are presented in Appendix Table 1.

For all our analyses, we use listwise deletion for item non-response. Item non-response affects fewer than 5% of observations for a given variable. In separate work, we construct and apply survey weights to adjust sample composition to align with the attributes of service sector workers in the American Community Survey. In this separate work, we find that our results are not sensitive to the application of survey weights. Although the survey weights shift the demographic composition of our survey sample, they have no effect on the results estimated in our regression models. Therefore, we present unweighted results.

Results

Table 1 presents descriptive statistics on our sample of 3,653 working parents with children 0 to 9 years of age. The average working parent uses 1.4 types of child care for their youngest child in a typical week (standard deviation of 1). As mentioned previously, this average number of care types is likely an underestimate, given that each type of care (e.g., grandparents or relatives) can only contribute 1 to the tally of care types even if that category may encompass multiple care providers (e.g., two or more grandparents or relative care providers).

[TABLE 1]

Spouses, grandparents, and relatives are the most commonly reported care providers. Almost three-quarters of parents reported that their spouse or partner is one source of child care for their young child. Most of these spouses or partners lived with the working parent and child. Almost 60% of working parents relied on grandparents or other relatives for care.

Sizeable minorities of working parents report using formal center-based care, babysitters, and children's older siblings for care. Almost one-quarter of working parents use some formal

daycare or school-based care. Nearly 20% report using a babysitter in a typical week. Overall, 18% of working parents rely on care from one of their other children. Among the two-thirds of working parents who report having more than one child, 25% report using the sibling for care.

Finally, 3% of parents reported that their 0 to 9 year old child was left alone without a care provider, and 6% reported either that the child was left alone or in the care of sibling younger than 10 years of age. These types of care arrangements are the least common, but pose special concerns related to lack of supervision and child safety.

As shown, a substantial portion of working parents in the service sector are exposed to on-call work and to last-minute schedule changes. Almost 28% of parents report being asked to work on-call, and almost 70% report a last-minute schedule change in the past month. We note that although a sizeable minority of parents experience on-call work and the majority experience last-minute schedule changes, there are also sizable portions of working parents who do not experience these types of schedule uncertainty. This variation is a key feature that enables our examination of the relationship between schedule uncertainty and child care arrangements. At the same time, our sample is unique in that we are comparing an otherwise fairly homogeneous sample of working parents, employed by 1 of 124 large retail or food service sector employers. Therefore, many potential confounding influences are held constant by definition.

In addition to the broad exposure to on-call and just-in-time scheduling, 37% of parents in the sample receive less than a weeks' notice of their work schedule, 57% work a variable work schedule, and a large majority (81%) have little or no control over their work schedule. The average worker works about 34 hours per week, earning about $11 or $12/hour.

The average working parent in the sample has two or more children, and her youngest child is less than 4 years old. Among parents with two or more children, the average age of the oldest

child is almost 11 years. About 75% of parents are either married or living with a partner. Most of the sample is white, non-Hispanic (73%), with 13% Hispanic and 6% African American. Eleven% of parents are combining school and work, and 43% had no more than a high school education.

Just-in-Time Scheduling and Child Care Arrangements. Table 2 presents results from regressions of just-in-time scheduling practices on number of type of child care arrangements. The model estimates for number of care arrangements shown in the first column are from an OLS regression model. The coefficients for the remaining columns in Table 2 are from linear probability models and thus represent the change in the probability of using the care arrangement associated with a one-unit change in the predictor variable. Table 2 also displays results from F-tests of the joint significance of on-call shifts and last-minute shift changes as predictors of child care arrangements. Significant F-tests are indicated by a cross symbol (†). Figure 1 displays the predicted value or predicted probabilities of each of the child dependent variables for parents who do not work on-call or experience last-minute shift changes compared with parents who do work on-call and experience last-minute changes.

[TABLE 2]

Both on-call scheduling and last-minute changes to work schedules are positively associated with the number of types of care arrangements. Parents who work on-call use 0.11 more types of care arrangements in a usual week compared with those who do not work on-call. Parents who experience last minute shift changes use 0.10 more types of care arrangements in a typical week. These model results suggest that parents who work on-call and experience last-

minute changes use about 0.21 more types of child care in a given week, 1.46 types compared with 1.25 types, or about one-fifth of a standard deviation difference (see Figure 1).

[FIGURE 1]

When work schedules are unpredictable, parents may have to rely more heavily on informal care arrangements from family, friends, or babysitters. We find some support for this prediction but that the particular types of informal child care vary between on-call shifts and last-minute shifts. Parents who experience last-minute shift changes are more likely to report using spousal and grandparent or relative care, and parents who work on-call are more likely to report using babysitter and sibling care.

When we test the joint significance of on-call shifts and last-minute shift changes, we find that just-in-time schedules are associated with more babysitter care (17% versus 23%, Figure 1), and more sibling care (16% versus 21%, Figure 1), but are not associated with spousal or grandparental care.

On-call shifts and last-minute shift changes are each positively associated with children being unsupervised by someone 10 years of age or older, but these relationships are not statistically significant. However, when we test the joint significance of on-call shifts and last-minute shift changes together, we find that just-in-time scheduling significantly increases the likelihood that children 0 to 9 years old will be left alone to care for themselves (from 2% to 4%, Figure 1). We also find that these two measures of just-in-time schedules, collectively, are significant predictors of a child being left without supervision from someone at least 10 years of age (from 5% to 8%, Figure 1).

As predicted, on-call shifts and last-minute shift changes are not associated with increased use of formal daycare or school-based care. These formal care arrangements are likely to be less

flexible in terms of last-minute scheduling, and therefore less likely to fill needs that arise from on-call and changing shifts.

The Table 2 and Figure 1 results provide evidence that exposure to just-in-time schedules has consequences for young children's care arrangements after controlling for a wide range of potential confounders. To test the robustness of these relationships, we further address selectivity into just-in-time schedules by constructing and applying propensity score weights that purge estimates of selection on observables.

The propensity score weighted results are presented in Table 3. As shown, weighting to purge selection on observables makes little difference in the estimated relationships between just-in-time schedules and child care arrangements compared with the results presented in Table 2. Most of the coefficients are similar in magnitude and significance. The joint tests of the statistical significance of on-call and last-minute schedule changes find that these are significant predictors of numbers of types of care, babysitter care, sibling care, and self-care. In contrast with the Table 2 results, after applying inverse probability of treatment weights, children being cared for by themselves or a sibling younger than 10 falls just shy of statistical significance (p=.052).

[TABLE 3]

Next, we consider whether on-call shifts and last-minute schedule changes are associated with the amount of care of each type in a typical week. Table 4 presents results from regressions in which the number of days of care type per week is regressed on on-call shifts and last-minute schedule changes.

[TABLE 4]

Table 4 shows that last-minute schedule changes are associated with about 0.3 more days of grandparent or relative care per week. Extrapolating this result suggests that last-minute

schedule changes are associated with 15 more days of care per year provided by grandparents, among the 68% of workers subject to these last-minute changes. On-call shifts are associated with 0.14 more days of babysitter care per week (or 7 days per year) and 0.20 more days of sibling care per week (or 10 days per year) among the 28% of parents who work these on-call shifts.

Although we do not have a measure of cost of care, we expect that the extra days of babysitter care come at an expense to working parents. The extra days of grandparent or relative care impose some opportunity cost for the care providers and may also mean that working parents are indebted to kin care providers and incur reciprocal obligations.

Table 4 shows that on-call shifts and last-minute schedule changes are collectively associated with an increase in the number of days a child spends alone or with a young sibling in a typical week. Summing the coefficients for on-call and last-minute changes suggests that just-in-time schedules are associated with an increase of 0.11 days per week in which a young child is left alone or in the care of a young sibling. Our model estimates that young children spend 15 days per year, for some period of time, left on their own or in the care of a sibling younger than 10 years of age when their parent has a job with an on-call schedule or that involves last-minute schedule changes. Children whose parents do not work on-call and do not experience such changes are less often left alone or in the care of young sibling (9 days annually, for some period of time).

Discussion

In recent decades, young children have come to spend an increasing portion of their early years being cared for by someone other than a parent. A large body of research establishes that the quality

and consistency of child care arrangements has a substantial influence on healthy child development. Over the same period of time, women's labor force participation has not only increased, but the jobs that less-educated Americans work have become more and more precarious (Kalleberg 2009). This precarity is manifest in low wages, nonstandard work schedules, but also unstable and unpredictable work schedules characterized by just-in-time scheduling practices like on-call shifts and last-minute schedule changes (Schneider and Harknett 2019a).

Against this backdrop, our paper examines how routine uncertainty in parents' work schedules influences the number and types of care arrangements for children 0 to 9 years of age. We extend prior research, which has examined how maternal employment and nonstandard work hours outside of Monday to Friday 9 to 5 schedule affect children's care arrangements by focusing on just-in-time scheduling practices that introduce routine uncertainty into the lives of parents and their children.

Our study focuses on parents working in the service sector while also raising young children, 0 to 9 years of age. The service sector is a setting where routine uncertainty in work schedules is prevalent. In our sample, almost 30% of parents report being asked to work "on-call," and almost 70% report last-minute changes to their work schedule. This routine uncertainty about when they would be needed for work has repercussions for children's child care arrangements. Routine uncertainty is largely incompatible with formal, center-based care, and increases the likelihood of needing a complex patchwork of care arrangements.

Our study documents, for a national sample of low-wage working parents, that on-call work and last-minute shift changes are associated with more numerous care arrangements, reliance on informal care arrangements, and relying on children to provide care for themselves and for their siblings. Collectively, the just-in-time scheduling conditions of on-call shifts and last-minute shift

changes together lead to increases in the use of babysitter and sibling care, as well as self-care and being left without care from someone at least 10 years of age.

We note a few limitations and cautions when interpreting our results. First, we are likely to have underestimated the complexity of child care arrangements for the young children in our sample, because the number of types of arrangements was not collected with precision in the Shift survey. In particular, the Shift survey asked about several different types of care (non-resident other parent, relative care, sibling care, babysitter, school or center-based care) but did not collect the number of care arrangements *within* each type (e.g., we do not know whether a parent used more than one relative for care, or more than one babysitter for care). The categories also do not distinguish between friends and babysitters and do not capture any information about child care costs. Second, before 2018, the Shift survey did not measure the number of different settings in which care was provided, and we cannot distinguish young children cared for in their familiar home environment from children cared for outside the home. Third, the local supply and affordability of child care providers enable or constrain the use of particular care arrangements, but are beyond the scope of our study.

We also acknowledge some methodological limitations inherent to our sample and research design. Our sample is not a probability sample, and our analysis is cross-sectional. In separate research, the Shift survey data has been validated through a series of tests that include benchmarking to probability samples (Schneider and Harknett 2019b). To address selectivity into just-in-time schedules, this paper includes a wide range of parent and job characteristics as covariates. We also find that our results are robust to the application of inverse probability of treatment weights. Although our results are not sensitive to selection on observed characteristics, we cannot rule out the possibility that unobserved omitted variables bias the results.

Our study is novel in providing a lens into the work scheduling conditions and care arrangements of a vulnerable and policy-relevant population: working parents who are combining low-wage work in the service sector with parenting young children. We capitalize on recent data from Shift Project, collected in 2017 and 2018, which include 3,653 such working parents. Our sample of parents employed at large retail and food service firms represents a particularly policy-relevant population – employees of large "big box" and chain firms that are the subject of recent city and state-level legislation to regulate work scheduling. These laws, passed in San Francisco, Seattle, New York City, Philadelphia, Chicago, and Oregon State, regulate or restrict the use of on-call work shifts and last-minute schedule changes (Wolfe, Jones, and Cooper 2018). While such laws are often motivated by a concern for how working parents exposed to just-in-time scheduling can secure quality child care, previously data on the association has been notably lacking. The associations that we document between just-in-time work schedules and child care arrangements have long been suspected and have been documented in localized qualitative studies, but to our knowledge this is the first time that the connection between routine uncertainty in work schedules and young children's care arrangements has been established for a national sample. We now have evidence from national data that just-in-time work schedules are associated with child care complexity, the use of informal care arrangements, and children's exposure to times without supervision from a mature caregiver.

References

Atherton, Olivia E., Thomas J. Schofield, Angela Sitka, Rand D. Conger, and Richard W. Robins. 2016. “Unsupervised Self-care Predicts Conduct Problems: The Moderating Roles of Hostile Aggression and Gender.” *Journal of Adolescence* 48: 1-10.

Blair, Sampson L. 1992. “The Sex-Typing of Children's Household Labor: Parental Influence on Daughters' and Sons' Housework.” *Youth & Society* 24: 178-2

Boyd-Swan, Casey H. 2019. “Nonparental Child Care During Nonstandard Hours: Does Participation Influence Child Well-being?” *Labour Economics* 57: 85-101.

Brady, Michelle. 2016. “Gluing, Catching and Connecting: How Informal Childcare Strengthens Single Mothers’ Employment Trajectories.” *Work, Employment and Society* 30: 821-837.

Bratsch-Hines, Mary E., Irina Mokrova, Lynne Vernon-Feagans, and Family Life Project Key Investigators. 2015. “Child Care Instability from 6 to 36 Months and the Social Adjustment of Children in Prekindergarten." *Early Childhood Research Quarterly* 30: 106-116.

Burton, Linda. 2007. “Childhood Adultification in Economically Disadvantaged Families: A Conceptual Model.” *Family Relations* 56: 329-345.

Camilli, Gregory, Sadako Vargas, Sharon Ryan, and W. Steven Barnett. 2010. “Meta-analysis of the Effects of Early Education Interventions on Cognitive and Social Development.” *Teachers College Record* 112(3): 579-620.

Capizzano, Jeffrey, Kathryn Tout, and Gina Adams. 2000. *Patterns of School-Age Children with Employed Mothers.* Washington D.C.: The Urban Institute.

Carrillo, Dani, Kristen Harknett, Allison Logan, Sigrid Luhr, and Daniel Schneider. 2017. “Instability of Work and Care: How Work Schedules Shape Child-Care Arrangements for Parents Working in the Service Sector.” *Social Service Review* 91: 422-455.

Casper, Lynn and Kristin E. Smith. 2004. “Self-Care: Why do Parents Leave their Children Unsupervised?” *Demography* 41: 285-301.

Chaudry, Ajay. 2004. *Putting Children First: How Low-Wage Working Mothers Manage Child Care*. New York, NY: Russell Sage Foundation.

Chaudry, Ajay, Juan Manuel Pedroza, Heather Sandstrom, Anna Danziger, Michel Grosz, Molly Scott, and Sarah Ting. 2011. *Child Care Choices of Low-Income Working Families*. Washington D.C.: The Urban Institute.

Coley, Rebekah Levine, Elizabeth Votruba-Drzal, Melissa Collins, and Kyle DeMeo Cook. 2016. “Comparing Public, Private, and Informal Preschool Programs in a National Sample of Low-Income Children.” *Early Childhood Research Quarterly* 36: 91-105.

Crosnoe, Robert, Kelly M. Purtell, Pamela Davis-Kean, Arya Ansari, and Aprile D. Benner. 2016. “The Selection of Children from Low-income Families into Preschool.” *Developmental Psychology* 52(4): 599-612.

Crouter, Ann C., Melissa R. Head, Matthew F. Bumpus, and Susan M. McHale. 2001. “Household Chores: Under What Conditions Do Mothers Lean on Daughters? *New Directions for Child and Adolescent Development* 94: 23-41.

Cryer, Debby, Laura Wagner-Moore, Margaret Burchinal, Noreen Yazejilan, Sarah Hurwitz, Mark Wolery. 2005. “Effects of Transitions to New Child Care Classes on Infant/Toddler Distress and Behavior.” *Early Childhood Research Quarterly* 20: 37-56.

de Schipper, J. Clasien, Louis W.C. Tavecchio, Marinus H. van IJzendoorn, and Jantien van Zeijl, 2004. “Goodness-of-Fit in Center Day Care: Relations of Temperament, Stability and Quality of Care with the Child's Adjustment.” *Early Childhood Research Quarterly* 19: 257-272.

de Schipper J. Clasien, Louis W.C. Tavecchio, Marinus H. Van IJzendoorn, and Mariëlle Linting. 2003. “The Relation of Flexible Child Care to Quality of Center Day Care and Children’s Socio-Emotional Functioning: A Survey and Observational Study.” *Infant Behavior and Development* 26: 300–325.

Dodson, Lisa and Jillian Dickert. 2004. “Girls’ Family Labor in Low-Income Households: A Decade of Qualitative Research. *Journal of Marriage and the Family* 66: 318.

East, Patricia L., and Thomas S. Weisner. 2009. “Mexican American Adolescents' Family Caregiving: Selection Effects and Longitudinal Associations with Adjustment.” *Family Relations* 58(5): 562-577.

East, Patricia L., and Sharon B. Hamill. 2013. “Sibling Caretaking Among Mexican American Youth: Conditions that Promote and Hinder Personal and School Success.” *Hispanic Journal of Behavioral Sciences* 35(4): 542-564.

Folk, Karen Fox and Yunae Yi. 1994. “Piecing Together Child Care with Multiple Arrangements: Crazy Quilt or Preferred Pattern for Employed Parents of Preschool Children?” *Journal of Marriage and the Family* 56: 669–80.

Galinsky, Ellen, Carollee Howes, Susan Kontos, and Marybeth Shinn. 1994. *The Study of Children in Family Child Care and Relative Care*. New York: Families and Work Institute.

Gennetian, Lisa, Greg Duncan, Virginia Knox, W. Vargas, E. Clark-Kauffman, and Andrew London. 2002. *How Welfare and Work Policies for Parents Affect Adolescents: A Synthesis of Research*. New York: Manpower Research Demonstration Corporation.

Gould, Elise, Lea J.E. Austin, and Marcy Whitebook. 2017. "What Does Good Child Care Reform Look Like?" Economic Policy Institute report.

Granger, Robert C. 2009. “After School Programs and Academics: Implications for Policy, Practice, and Research.” *Social Policy Report* 22(2):1-20.

Greenwood, Shannon, Andrew Perrin, and Maeve Duggan. 2016. *Social Media Update 2016*. Pew Research Center report.

Guinosso, Stephanie A., Sara B. Johnson, and Anne W. Riley. 2016. “Multiple Adverse Experiences and Child Cognitive Development.” *Pediatric Research* 79(1-2): 220.

Hafford, Carol. 2010. “Sibling Caretaking in Immigrant Families: Understanding Cultural Practices to Inform Child Welfare Practice and Evaluation.” *Evaluation and Program Planning* 33: 294-302.

Han, Wen Jui. 2004. “Nonstandard Work Schedules and Child Care Decisions: Evidence from the NICHD Study of Early Child Care.” *Early Childhood Research Quarterly* 19: 231–56.

Henly, Julia and Susan Lambert. 2005. “Nonstandard Work and Child-Care Needs of Low-Income Parents.” In Bianchi, S., Casper, L., King, R. (Eds.), *Work, family, health, and well-being* (pp. 473-492). Mahwah, NJ: Erlbaum.

Henly, Julia and Susan Lambert. 2014. “Unpredictable Work Timing in Retail Jobs Implications for Employee Work-Life Conflict.” *Industrial & Labor Relations Review* 67: 986-1016.

Henly, Julia and Sandra Lyons. 2000. “The Negotiation of Child Care and Employment Demands among Low-Income Parents.” *Journal of Social Issues* 56: 683-706.

Henly, Julia R., Heather Sandstrom, Amy Claessens, Alejandra Ros Pilarz, Julia Gelatt, JaeSeung Kim, and Olivia Healy. 2015. *Determinants of Subsidy Stability and Child Care Continuity*. Final Report for the Illinois–New York Child Care Research Partnership. Washington D.C.: The Urban Institute.

Henly, Julia, Luke Shaefer, and Elaine Waxman. 2006. “Nonstandard Work Schedules: Employer- and Employee-Driven Flexibility in Retail Jobs.” *Social Service Review* 80: 609-634.

Hepburn, Peter. 2018. “Parental Work Schedules and Child-Care Arrangements in Low-Income Families” *Journal of Marriage and Family* 80: 1187–1209

Heymann, J. 2006. *Forgotten Families: Ending the Growing Crisis Confronting Children and Working Parents in the Global Economy*. Oxford: Oxford University Press.

Hofferth, Sandra, and Nancy Collins. 2000. “Child Care and Employment Turnover.” *Population Research and Policy Review* 19: 357–95.

Hooper, Lisa M., Sara Tomek, Justin M. Bond, and Meagan S. Reif. 2015. “Race/ethnicity, Gender, Parentification, and Psychological Functioning: Comparisons Among a Nationwide University Sample.” *The Family Journal* 23(1): 33-48.

Howes, Carollee. 2011. “Children's Social Development within the Socialization Context of Child Care and Early Childhood Education.” In P.K. Smith and C.H Hart (Eds.), *The Wiley-Blackwell Handbook of Childhood Social Development* (pp. 246-262). Wiley-Blackwell.

Hsueh, JoAnn, and Lisa A. Gennetian. 2011. “Welfare Policies and Adolescents: Exploring the Roles of Sibling Care, Maternal Work Schedules, and Economic Resources." *American Journal of Community Psychology* 48(3-4): 322-340.

Huston, Aletha C., Young Eug Chang, and Lisa Gennetian. 2002. *Family and Individual Predictors of Child Care Use by low-Income Families in Different Policy Contexts.* The Next Generation Working Paper 9. New York: MDRC.

Kalleberg, Arne. 2009. “Precarious Work, Insecure Workers: Employment Relations in Transition.” *American Sociological Review* 74:1-22.

Kennedy, Courtney and Hannah Hartig. 2019. “Response Rates in Telephone Surveys have Resumed their Decline” Pew Research Center Fact Tank.

Kerrebrock, Nancy, and Eugene M. Lewit. 1999. “Children in Self-Care.” *The Future of Children 9*: 151-160.

Lambert, Susan. 2008. “Passing the Buck: Labor Flexibility Practices that Transfer Risk onto Hourly Workers.” *Human Relations* 61:1203–1227

Laughlin, Lynda. 2013. *Who’s Minding the Kids? Child Care Arrangements: Spring 2011*. U.S. Census Bureau, U. S. Department of Commerce.

Levesque, Roger. 2016. “Latchkey Children.” *Encyclopedia of Adolescence* 1-3.

Liu, Meirong. 2015. “An Ecological Review of Literature on Factors Influencing Working Mothers’ Child Care Arrangements.” *Journal of Child and Family Studies* 24(1): 161-171.

Loeb, Susanna, Bruce Fuller, Sharon Lynn Kagan, and Bidemi Carrol. 2004. “Child Care in Poor Communities: Early Learning Effects of Type, Quality, and Stability.” *Child Development* 75: 47-65.

Loeb, Susanna. 2016. “Missing the Target: We Need to Focus on Informal Care Rather Than Preschool.” *Evidence Speaks Reports* 1(19):1-4.

Lopoo, Leonard M. 2005. “Maternal Employment and Latchkey Adolescents.” *Social Service Review* 79(4): 602-623.

Lowe, Edward D., Weisner, Thomas S. 2006. “Child Care and Low-Wage Employment.” In Yoshikawa, H., Weisner, T. S., Lowe, E. D. (Eds.), *Making it Work: Low-Wage Employment, Family Life, and Child Development* (pp. 235-255). New York, NY: Russell Sage Foundation.

Lowe Edward D, Weisner Thomas S., Sonya Geis, and Aletha Huston. 2005. “Child Care Instability and the Effort to Sustain a Daily Working Routine: Evidence from the New Hope

Ethnographic Study of Low-Income Families." In Cooper C. R., Garcia Coll C., Bartko W. T., Davis H. M., Chatman C. (Eds.), *Developmental Pathways through Middle Childhood: Rethinking Contexts and Diversity as Resources* (pp. 121-144). Mahwah, NJ: Erlbaum.

Mahoney, Joseph L., and Maria E. Parente. 2009. "Should We Care About Adolescents Who Care for Themselves: What We Have Learned and What We Need to Know about Youth in Self-care. *Child Development Perspectives* 3:189-195.

McCoy, Dana Charles, Hirokazu Yoshikawa, Kathleen M. Ziol-Guest, Greg J. Duncan, Holly S. Schindler, Katherine Magnuson, Rui Yang, Andrew Koepp, and Jack P. Shonkoff. 2017. "Impacts of Early Childhood Education on Medium- and Long-Term Educational Outcomes." *Educational Researcher* 46(8): 474-487.

Morrissey, Taryn W. 2009. "Multiple Child-Care Arrangements and Young Children's Behavioral Outcomes." *Child Development* 80: 59-76.

Morrissey, Taryn W. 2017. "Child Care and Parent Labor Force Participation: A Review of the Research Literature." *Review of Economics of the Household* 15(1): 1-24.

Morrongiello, Barbara A., Nora Klemencic, and Michael Corbett. 2008. "Interactions Between Child Behavior Patterns and Parent Supervision: Implications for Children's Risk of Unintentional Injury." *Child Development* 79: 627-638.

Morrongiello, Barbara A., Stacey L. Schell, and Sarah Schmidt. 2010. "Please Keep an Eye on your Younger Sister: Sibling Supervision and Young Children's Risk of Unintentional Injury." *Injury Prevention* 16: 398-402.

Mortensen, Jennifer A., and Melissa A. Barnett. 2015. "Teacher–child Interactions in Infant/Toddler Child Care and Socioemotional Development." *Early Education and Development* 26(2): 209-229.

NICHD Early Child Care Research Network. 2002. "Early Child Care and Children's Development Prior to School Entry: Results from the NICHD Study of Early Child Care" *American Educational Research Journal* 39: 133-164.

NICHD Early Child Care Research Network. 2005. *Child Care and Child Development: Results from the NICHD Study of Early Child Care and Youth Development*. Guilford Press.

Park, Hyejoon, and Min Zhan. 2017. "The Impact of After-school Childcare Arrangements on the Developmental Outcomes of Low-income Children." *Children and Youth Services Review* 73: 230-241.

Pettit, Gregory S., Robert D. Laird, John E. Bates, Kenneth A. Dodge. 1997. "Patterns of After-School Care in Middle Childhood: Risk Factors and Developmental Outcomes." *Merrill-Palmer Quarterly* 43: 515-538

Pew Research Center. 2018. "Social Media Fact Sheet." Retrieved from http://www.pewinternet.org/fact-sheet/social-media/

Pilarz, Alejandra Ros, and Heather D. Hill. 2014. "Unstable and Multiple Child Care Arrangements and Young Children's Behavior." *Early Childhood Research Quarterly* 29(4): 471-483.

Presser, Harriet. 2003. *Working in a 24/7 Economy: Challenges for American Families.* New York, NY: Russell Sage Foundation.

Presser, Harriet. 1989. "Some Economic Complexities of Child Care Provided by Grandmothers." *Journal of Marriage and the Family* 51: 581–591.

Presser, Harriet. 1988. "Shift Work and Child Care among Young Dual-Earner American Parents." *Journal of Marriage and the Family* 50: 133–148.

Presser, Harriet. 1998. “Can We Make Time for Children? The Economy, Work Schedules, and Child Care.” *Demography* 26: 523–543.

Prickett, Kate C. 2016. “Nonstandard Work Schedules, Family Dynamics, and Mother–Child Interactions During Early Childhood.” *Journal of Family Issues*.

Queralt, Magaly and Ann D. Witte. 1998. “A Map for You? Geographic Information Systems in the Social Services.” *Social Work* 43: 455-469.

Rachidi, Angela. 2016. “Child Care Assistance and Nonstandard Work Schedules.” *Children and Youth Services Review* 65: 104-111.

Rivara, Frederick P. 1995. “Crime, Violence and Injuries in Children and Adolescents: Common Risk Factors?” *Criminal Behavior and Mental Health* 5: 357-385.

Roche, Kathleen M., Nan Marie Astone, and David Bishai. 2007. “Out-of-School Care and Youth Problem Behaviors in Low-Income, Urban Area. *Journal of Family and Economic Issues* 28: 471-488.

Ruiz-Casares, Mónica, José Nazif-Muñoz, René Iwo, and Youssef Oulhote. 2018. “Nonadult Supervision of Children in Low-and Middle-income Countries: Results from 61 National Population-based Surveys.” *International Journal of Environmental Research and Public Health* 15(8): 1564.

Saluja, Gitanjal, Ruth Brenner, Barbara A. Morrongiello, Denise Haynie, Michelle Rivera and Tina L. Cheng. 2004. “The Role of Supervision in Child Injury Risk: Definition, Conceptual and Measurement Issues.” *Injury Control and Safety Promotion* 11:17-22.

Sandstrom, Heather, and Ajay Chaudry. 2012. “‘You Have to Choose Your Childcare to Fit Your Work’: Childcare Decision-making among Low-income Working Families.” *Journal of Children and Poverty* 18: 89-119.

Sandstrom, Heather, and Sandra Huerta. 2013. *The Negative Effects of Instability on Child Development: A Research Synthesis*. Washington, DC: Urban Institute.

Schmit, Stephanie, and Christina Walker. 2016. *Disparate Access: Head Start and CCDBG data by Race and Ethnicity*. The Center for Law and Social Policy.

Schneider, Daniel, and Kristen Harknett. 2019a. "Consequences of Routine Work-Schedule Instability for Worker Health and Well-Being." *American Sociological Review* 84(1): 82-114.

Schneider, Daniel, and Kristen Harknett. 2019b. "What's to Like? Facebook as a Tool for Survey Data Collection." *Sociological Methods and Research.* (forthcoming)

Schnitzer, Patricia G., M. Denise Dowd, Robin L. Kruse, and Barbara A. Morrongiello. 2015. "Supervision and Risk of Unintentional Injury in Young Children." *Injury Prevention* 21(1):63-70.

Scott, Ellen K. and Miriam J. Abelson. 2016. "Understanding the Relationship Between Instability in Child Care and Instability in Employment for Families with Subsidized Care." *Journal of Family Issues* 37: 344-368.

Scott Ellen K., Andrew S. London, and Allison Hurst. 2005. "Instability in Patchworks of Child Care When Moving from Welfare to Work." J*ournal of Marriage and Family* 67: 370-386.

Shonkoff, Jack P. and Deborah A. Phillips (Eds.). 2000. *From Neurons to Neighborhoods: The Science of Early Childhood Programs*. Washington, DC: National Academy Press.

Tran, Henry, and Marsha Weinraub. 2006. "Child Care Effects in Context: Stability, and Multiplicity in Nonmaternal Child Care Arrangements during the First 15 Months of Life." *American Psychological Association* 42: 566–82.

Usdansky, Margaret L., and Douglas A. Wolf. 2008. “When Child Care Breaks Down: Mothers' Experiences with Child Care Problems and Resulting Missed Work.” *Journal of Family Issues* 29(9): 1185-1210.

Vandell, Deborah L. and Mary Anne Corasaniti. 1998. “The Relation between Third Graders' After School Care and Social, Academic, and Emotional Functioning.” *Child Development* 59: 868-875.

Vandell, Deborah. L., Margaret Burchinal, and Kim M. Pierce. 2016. “Early Child Care and Adolescent Functioning at the End of High School: Results from the NICHD Study of Early Child Care and Youth Development.” *Developmental Psychology 52*(10): 1634-1645.

Vandivere, Sharon, Kathryn Tour, Jeffrey Capizzano, Martha Zaslow. 2003. “Unsupervised Time: Family and Child Factors Associated with Self-Care.” In Occasional Paper Number 71; The Urban Institute: Washington, DC.

Venter, Elza, and Eunice Rambau. 2011. “The Effect of a Latchkey Situation on a Child’s Educational Success.” *South African Journal of Education* 31(3): 345-356.

Wikle, Jocelyn S., Alexander C. Jensen, and Alexander M. Hoagland. 2018. “Adolescent Caretaking of Younger Siblings.” *Social Science Research* 71: 72-84.

Williams, Joan C., Mary Blair-Loy, and Jennifer L. Berdahl. 2013. “Cultural Schemas, Social Class, and the Flexibility Stigma. *Journal of Social Issues* 69: 209-234.

Wolfe, Julia, Janelle Jones, and David Cooper. 2018. *`Fair workweek' Laws Help more than 1.8 Million Workers.* Washington D.C.: Economic Policy Institute report.

World Health Organization. 2008. World Report on Child Injury Prevention. Geneva, Switzerland.

Table 1. Descriptives for Working Parents with Children Aged 0 to 9 Years

	Mean or %	Std Dev
Child care arrangements		
Number of care arrangements	1.4	(1.0)
Spousal care	74.6	
Grandparent/relative care	59.6	
Babysitter care	19.2	
Sibling care	17.8	
Child cares for self	3.2	
Sibling younger than 10 care or self care	6.2	
Day care	24.4	
Just-in-time work schedule conditions		
Worked on-call last month	27.8	
Last minute schedule change in last month	68.3	
Other work schedule features		
Less than 1 week advanced notice	36.8	
Variable work schedule	56.6	
Little or no control over work schedule	81.3	
Child characteristics		
One child only (%)	36.3	
Two or more children (%)	63.7	
Youngest child's age (years)	3.8	(2.8)
Oldest sibling's age (years)	10.9	(5.2)
Mother characteristics		
Age 18-19 years	2.1	
Age 20-29 years	39.7	
Age 30-39 years	41.1	
Age 40 or more years	17.1	
Married	43.0	
Living with partner	31.2	
Not living with partner	25.9	
White, non Hispanic	72.9	
Hispanic	12.9	
Black, non Hispanic	5.9	
Asian Pacific Islander	2.4	
American Indian, Alaskan Native	2.7	
Other race, non-Hispanic	3.2	
Enrolled in school	9.7	
High school degree or less education	42.8	
Some college education	49.2	
Has a college degree	8.0	(continued)

Table 1. Descriptives for Working Parents with Children Aged 0 to 9 Years

	Mean or %	Std Dev
Job characteristics		
Job tenure		
Less than 1 year	19.7	
1-2 years	28.7	
3-5 years	24.3	
6+ years	27.3	
Number of usual weekly hours		
Less than 20 hours per week	13.9	
20 to less than 30 hours per week	22.4	
30 to less than 40 hours per week	50.8	
More than 40 hours per week	12.9	
Resources		
Hourly wage	$ 11.78	
Annual household income		
Less than $15,000	20.2	
$15,000 to less than $25,000	24.1	
$25,000 to less than $35,000	17.3	
$35,000 to less than $50,000	17.2	
$50,000 to less than $75,000	12.5	
$75,000 or more	8.6	
Could not cope with $400 expense shock		
Certainly	18.9	
Probably	26.3	
Probably not	23.7	
Certainly not	31.1	
n	3,653	

Table 2. Child Care Arrangements Regressed on Just in Time Work Schedules for Working Parents with a Child Aged 0 to 9 Years

	Number of care arrangements	Spousal care	Grandparent or relative care	Babysitter care	Sibling care	Child cares for self	Sibling less than 10 or self care	Formal day care or school care
Worked On-Call	0.11 **	-0.01	-0.02	0.04 *	0.04 **	0.01	0.02	0.03
	(3.07)	(0.50)	(1.18)	(2.52)	(2.90)	(1.46)	(1.86)	(1.54)
Shift Change	0.10 ** †	0.03	0.06 *** †	0.02 †	0.02 †	0.01 †	0.01 †	-0.01
	(3.06)	(1.91)	(3.42)	(1.46)	(1.26)	(1.85)	(1.00)	(0.79)
Variable schedule	0.15 ***	0.04 **	0.08 ***	0.02	0.01	0.00	0.00	0.01
	(4.70)	(3.04)	(5.03)	(1.75)	(0.46)	(0.45)	(0.29)	(0.97)
< 1 week notice	-0.03	-0.03	-0.01	0.01	-0.01	0.00	0.00	-0.01
	(0.89)	(1.86)	(0.29)	(0.67)	(0.63)	(0.43)	(0.05)	(0.88)
Lack schedule control	-0.05	-0.01	-0.02	0.02	-0.03	-0.01	-0.01	0.00
	(0.98)	(0.41)	(0.61)	(0.72)	(1.63)	(0.58)	(1.13)	(0.13)
Youngest child age	0.01	-0.01 **	-0.01 **	-0.01 ***	0.02 ***	0.01 ***	0.00 **	0.00
	(1.31)	(3.03)	(2.93)	(4.00)	(8.76)	(4.48)	(2.69)	(0.26)
Has 2+ children	0.00	0.01	-0.09 ***	-0.01	0.14 ***	0.00	-0.02	-0.05 **
	(0.06)	(0.64)	(4.81)	(0.66)	(10.30)	(0.48)	(1.89)	(3.08)
Female	0.07	-0.06 ***	0.02	0.02	0.05 ***	0.00	0.00	0.03
	(1.85)	(3.61)	(1.19)	(1.43)	(3.30)	(0.52)	(0.18)	(1.82)
Not living w/ partner	-0.81 ***	0.37 ***	-0.11 ***	-0.10 ***	-0.03 *	0.00	-0.02 *	-0.11 ***
	(21.27)	(22.93)	(5.60)	(5.98)	(2.26)	(0.20)	(2.16)	(6.24)
Intercept	1.29 ***	0.52 ***	0.68 ***	0.19 **	0.01	-0.05	0.03	-0.02
	(7.52)	(7.04)	(7.63)	(2.62)	(0.12)	(1.41)	(0.57)	(0.23)
N	3632	3668	3667	3650	3651	3644	3642	3653

T-statistics in parentheses; * p<0.05, ** p<0.01, *** p<0.001; † indicates that the F-test of joint significance of on-call and last-minute scheduling changes significant at p<.05.

Models also control for mother's age, race/ethnicity, education, school enrollment, household income, resources to cope with a $400 expense shock, job tenure, usual weekly hours, hourly wage, manager, interview month. Coefficients on these additional covariates not shown.

Table 3. Child Care Arrangements regressed on Just in Time Work Schedules for Working Parents with a Child Aged 0 to 9 Years accounting for selection using Inverse Probability of Treatment Weights

	Number of care arrangements	Spousal care	Grandparent or relative care	Babysitter care	Sibling care	Child cares for self	Sibling less than 10 or self care	Formal day care or school care
Worked On-Call	0.12 **	-0.01	-0.02	0.04 *	0.04 *	0.01	0.02	0.03
	(3.02)	(0.33)	(0.98)	(2.48)	(2.56)	(1.40)	(1.62)	(1.81)
Shift Change	0.09 **	0.02	0.05 **	0.02	0.02	0.01	0.01	-0.0061
	(2.69)	(1.32)	(2.86)	(1.22)	(1.23)	(1.78)	(0.96)	(0.38)
F-test	18.50	0.45	1.75	7.90	8.67	5.95	3.79	1.37
	p<.001 †	p=.501	p=.186	p=.005 †	p=.003 †	p=.015 †	p=.052	p=.242
n	3632	3668	3667	3650	3651	3644	3642	3653

T-statistics in parentheses; * p<0.05, ** p<0.01, *** p<0.001; † indicates that the F-test of joint significance of on-call and last-minute scheduling changes significant at p<.05.

Models also control for variable schedule, schedule notice, schedule control; parent has more than one child, youngest child age, parental age, race/ethnicity, education, school enrollment, household income, resources to cope with a $400 expense shock, job tenure, usual weekly hours, hourly wage, manager, and interview month. Coefficients on these additional covariates not shown.

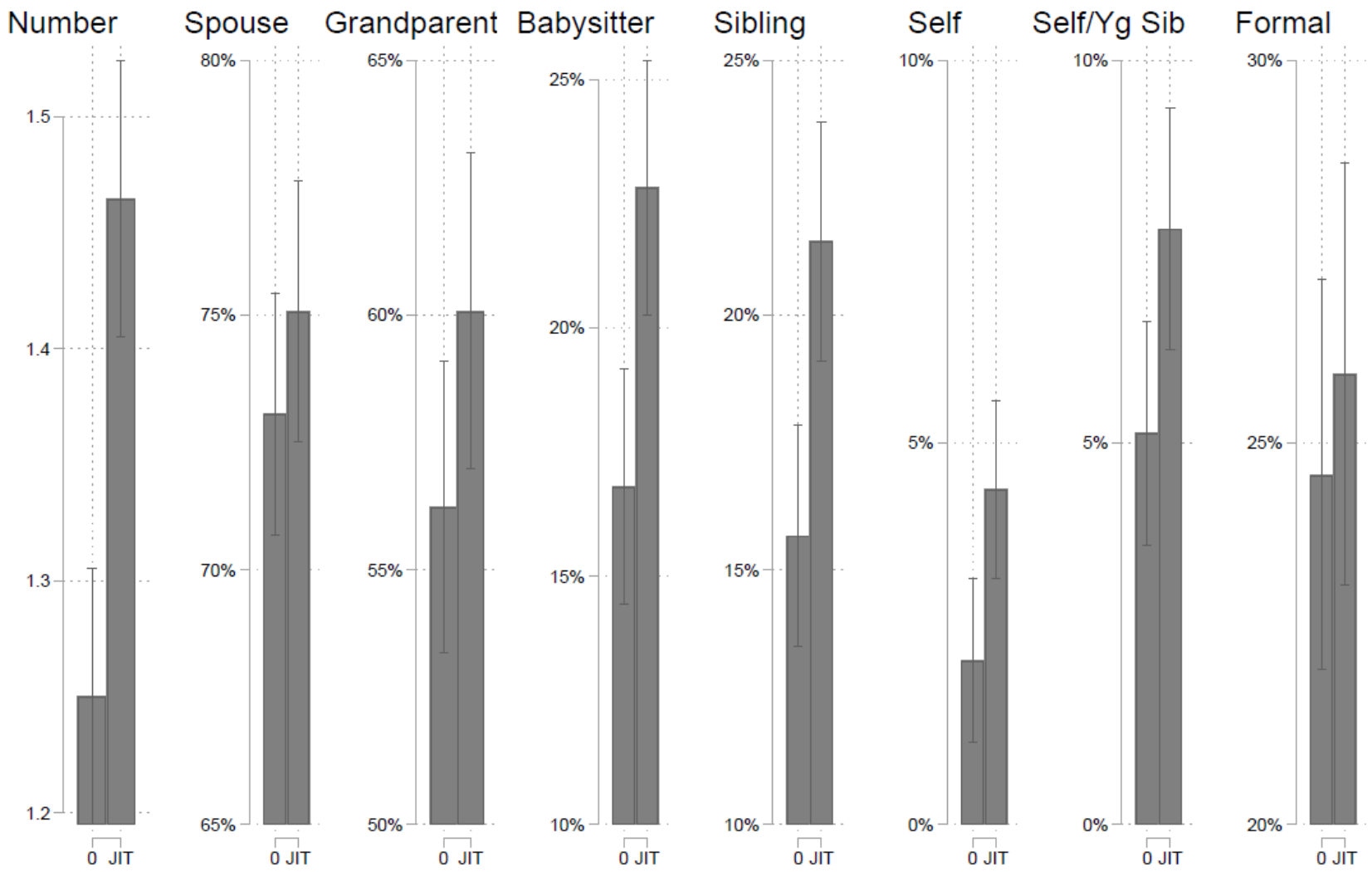
Table 4. Days of Child Care Type regressed on Just in Time Work Schedules for Working Parents with a Child Aged 0 to 9 Years

	Days of Spousal care/week	Days of Grandparent or relative care/week	Days of Babysitter care/week	Days of Sibling care/week	Days Child cares for self/week	Days of Sibling less than 10 or self care/week	Days of Formal day care or school care/week
Worked On-Call	-0.062	-0.040	0.138 *	0.200 ***	0.054	0.095 *	0.094
	(0.70)	(0.46)	(2.27)	(3.61)	(1.75)	(2.47)	(1.11)
Shift Change	0.161	0.294 ***	0.051	-0.006	0.047	0.016	-0.058
	(1.90)	(3.56)	(0.89)	(0.10)	(1.59)	(0.44)	(0.72)
F-test	0.77	5.3	6.09	7.68	6.62	5.23	0.11
	p = 0.382	p=0.021 †	p=0.014 †	p=.006 †	p=.010 †	p=.022 †	p=.0738
n	3668	3667	3650	3651	3644	3642	3653

T-statistics in parentheses; * p<0.05, ** p<0.01, *** p<0.001; † indicates that the F-test of joint significance of on-call and last-minute scheduling changes significant at p<.05.

Models also control for variable schedule, schedule notice, schedule control; parent has more than one child, youngest child age, parental age, race/ethnicity, education, school enrollment, household income, resources to cope with a $400 expense shock, job tenure, usual weekly hours, hourly wage, manager, and interview month. Coefficients on these additional covariates not shown.

Figure 1. Child Care Arrangements by On-Call Shifts or Last-Minute Schedule Changes (JIT)



Notes: "Number" is number of types of care; "Self" is child is unsupervised; "Self/Yg Sib" is child is left alone or with a sibling younger than 10 years of age; "Formal" is child care provided by a daycare center or school-based care provider. The left bar in each pair represents those who do not work on-call and do not experience last-minute shift changes and the right bar in each pair represents those who work on-call and experience last-minute changes.

Appendix Table 1. Days of Child Care Type regressed on Just in Time Work Schedules for Working Parents with a Child Aged 0 to 9 Years
Ordered Logistic Regression Coefficients

	Days of Spousal care/week	Days of Grandparent or relative care/week	Days of Babysitter care/week	Days of Sibling care/week	Days Child cares for self/week	Days of Sibling less than 10 or self care/week	Days of Formal day care or school care/week
Worked On-Call	-0.032	-0.043	0.251 **	0.361 ***	0.312	0.307 *	0.147
	(0.42)	(0.59)	(2.58)	(3.39)	(1.45)	(1.97)	(1.58)
Shift Change	0.117	0.248 ***	0.130	0.099	0.448	0.158	-0.078
	(1.64)	(3.60)	(1.32)	(0.95)	(1.91)	(0.97)	(0.89)
F-test	0.78	4.96	8.95	11.26	6.93	5.08	0.35
	p = 0.376	p=0.0259 †	p=0.003 †	p=.001 †	p=.009 †	p=.024 †	p=.555
n	3668	3667	3650	3651	3644	3642	3653

T-statistics in parentheses; * p<0.05, ** p<0.01, *** p<0.001; † indicates that the F-test of joint significance of on-call and last-minute scheduling changes significant at p<.05.
Models also control for variable schedule, schedule notice, schedule control; parent has more than one child, youngest child age, parental age, race/ethnicity, education, school enrollment, household income, resources to cope with a $400 expense shock, job tenure, usual weekly hours, hourly wage, manager, and interview month. Coefficients on these additional covariates not shown.