



Mothers' nonstandard work schedules and children's behavior problems: Divergent patterns by maternal education[☆]

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ABSTRACT

Increasing evidence has demonstrated that nonstandard work schedules are more prevalent among the less-educated population, and mothers' nonstandard work schedules have adverse influences on children's development. Yet, we have known relatively little about how such impacts differ across the educational distribution. Using data from the Future of Families and Child Wellbeing Study, random and fixed effects regression results revealed a general "pattern of disadvantage" in the sense that detrimental influences of mothers regularly working nonstandard schedules on children's behavior were concentrated among those born to mothers without high school education, a "truly disadvantaged" group in the contemporary United States. In addition, regular nonstandard schedules appeared to play a mixed role in the behavioral development of children who had college-educated mothers, depending on the specific type of nonstandard schedule. These findings suggest that children born to the least-educated mothers experience compounded disadvantages that may reinforce the intergenerational transmission of disadvantages and also illustrate that negative implications of nonstandard work schedules for child wellbeing may extend to the more advantaged group.

1. Introduction

Due to the changing economy, demographic shifts, and technological advancement, nonstandard work schedules – work outside of the typical 9–5, Monday through Friday schedule – have been increasingly prevalent across the industrialized world (Fagan, 2001; McMenamin, 2007; Presser, 2003). For instance, in 2011, one-fifth of the American workforce operated on nonstandard schedules, working mostly outside the 6 a.m. to 6 p.m. range, including weekends (Enchautegui, 2013). Moreover, many working mothers, particularly those with low income and less education, are at higher risk of working nonstandard schedules (Enchautegui, Johnson, & Gelatt, 2015). This labor market trend raised concerns about its impacts on individuals' well-being, family life, and child development.

A growing body of research has documented negative influences of mothers' nonstandard work schedules on multiple outcomes, such as mothers' well-being, childcare arrangement and work-family balance,

and parent-child interactions (Ananat & Gassman-Pines, 2021; Hepburn, 2018; Liu Wang, Keesler, & Schneider, 2011; Lozano, Hamplová, & Le Bourdais, 2016). Given these relationships, it is unsurprising that mothers' nonstandard work schedules have been linked to worse child outcomes, including children's lower cognitive ability, more emotional and behavioral problems, and worse physical and mental health (Dunifon, Kalil, Crosby, & Su, 2013; Gassman-Pines, 2011; Han and Fox, 2011; Han, Miller, & Waldfogel 2010; Strazdins et al., 2006). Despite acknowledging the unequal prevalence of nonstandard work schedules by education, previous research has paid surprisingly little attention to the potential educational differences in how mothers' nonstandard work schedules affect child outcomes. This is an essential oversight in light of the importance of education in stratifying American family life and children's development over the past decades (Cavanagh & Fomby, 2019; Cherlin, 2014; McLanahan, 2004).

There are good theoretical reasons to expect significant educational gradients in the influences of mothers' nonstandard work schedules on

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children's well-being. First, the nature and circumstances of working nonstandard schedules are likely to vary across the educational spectrum. More-educated mothers are more likely to work nonstandard schedules (often with job flexibility) voluntarily to meet family and parenting responsibilities, such as mothers in dual-earner families engaging in tag-team parenting (Enchautegui, Johnson, and Gelatt, 2015; Garey, 1999). Less-educated mothers, however, often end up working such schedules without many options. Second, education is a fundamental cause determining individuals' health, well-being, and coping strategies/resources (Link & Phelan, 1995; Phelan Link, Diez-Roux, Kawachi, & Levin, 2004; Taylor and Seeman, 1999). Working nonstandard hours often leads to poorer health and less capacity to deal with job demands and stressors among mothers, particularly those less-educated, leaving their families and children vulnerable to various challenges posed by such work schedules. Lastly, education is increasingly stratifying the American family system in demographic behaviors and family processes (Cavanagh & Fomby, 2019; Cherlin, 2014; Smock and Schwartz, 2020). Recent scholarship points out that engaging in nonstandard work schedules and negotiating their consequences on family life are unequal social processes that often favor people with more socioeconomic resources (Gerstel & Clawson, 2018), such as more education. These together suggest that a general "pattern of disadvantage" may exist where negative impacts of nonstandard work schedules are more pronounced among children with less-educated (vs. more-educated) mothers, over and above their disadvantages in other life domains. However, these educational differences may differ depending on the specific timing of a nonstandard work schedule, where workers' abilities to control and adapt to work schedules also tend to vary.

This study moves beyond previous research by explicitly focusing on the educational variation in the linkages between mothers' various nonstandard work schedules and children's behavior problems. As one essential component of non-cognitive skills, children's behavioral functioning in early life is a significant predictor of their cognitive ability and school success (Duckworth & Seligman, 2005; Farkas, 2003) and also has lasting implications for later-life employment, earnings, and other socioeconomic success (Heckman & Rubinstein, 2001; Heckman, Stixrud, & Urzua, 2006). Existing empirical studies have shown that parents' nonstandard work schedules have more consistent relationships with children's behavior problems during early childhood and adolescence than cognitive outcomes (Li et al., 2014).

Drawing on longitudinal data of urban mothers with children from the Future of Families and Child Wellbeing Study (FFCWS), this study aims to answer the following questions: First, how are different types of mothers' nonstandard work schedules related to children's behavior problems? Second, whether and how do these relationships vary by mothers' educational attainment? Answering these questions sheds new light on understanding how education stratifies consequences of mothers' work schedules in producing unequal child development and intergenerational transmission of (dis)advantages across American families.

2. Theoretical background

2.1. Linking mothers' nonstandard work schedules to child development

Increasing shares of workers are working nonstandard schedules outside the normal weekday time as American society and many other countries move toward a "24/7" economy (Presser, 2003), where the growth of the service sector has generated a large demand for work around the clock. Changing demographic trends such as the rise of two-earner families and advanced technologies also help increase the demand for nonstandard work hours. In the U.S., nonstandard schedules often reflect deteriorated job quality and pervasive job insecurity (Kal-leberg, 2011), posing substantial challenges to family life and functioning. Although a mother can freely choose nonstandard schedules for

various reasons, such schedules are largely concentrated among mothers with low socioeconomic status (SES) (such as low education) who often lack family support and have to work such schedules without other options.

Mothers' nonstandard work schedules could affect children's development either directly as a distal factor or indirectly through various pathways (Li et al., 2014). The ecological systems framework acknowledges that child development occurs within nested systems such as family, work, school, and community, which are the immediate settings in which a child grows and develops (Bronfenbrenner, 1979; Voydanoff, 2007). The workplace is an integral part of the large exo-system that affects children. Accordingly, mothers' employment conditions and (nonstandard) work schedules are likely to influence children's development directly as a distal factor (the arrow pointing from T to Y , Fig. 1). Although children themselves do not directly experience mothers' work conditions, they need adequate care, tremendous attention, safety, and security in the immediate environment to grow and develop optimally (World Health Organization, 2020). When mothers work nonstandard (often unpredictable) schedules, children may easily feel anxious and insecure from mothers' absence, get upset with disrupted attention from mothers, and build up unmet developmental needs, which could adversely influence their well-being both physically and psychologically. Along this reasoning line, a large body of studies has yielded supporting evidence that net of family and mothers' characteristics, maternal employment and work schedules have independent influences on a range of children's developmental outcomes (Baydar & Brooks-Gunn, 1991; Han, 2005, 2006; Han and Fox, 2011; Johnson, Kalil, and Dunifon, 2012; Parcel and Menaghan, 1990; Waldfogel, Han, & Brooks-Gunn, 2002), albeit the direction and magnitude often varying from study to study.¹

Moreover, nonstandard work schedules could also indirectly influence children via different mechanisms. The conceptual resource framework has outlined various resources that could be shaped by mothers' (and fathers') work schedules, which, in turn, may affect children's development (Brooks-Gunn et al., 1995). Based on this theory and empirical research, two main sets of factors serve as potential mediating pathways. The first is mothers' own well-being, such as physical health and psychological well-being (M^1 in Fig. 1). The second is familial resources and processes, including work-family balance, parenting, and mother-child interactions (M^2 in Fig. 1).² These two sets of factors are not isolated but interdependent (dashed lines between M^1 and M^2 , Fig. 1). Empirical findings have consistently shown that working nonstandard schedules is associated with mothers' disturbed sleep patterns and poorer health (Fenwick & Tausig, 2001; Kalil, Dunifon, Crosby, & Su, 2014), higher levels of stress, depression and perceived work-family conflict (Chait Barnett, Gareis, and Brennan, 2008; Liu et al., 2011; Lozano et al., 2016), more difficulties in arranging childcare and decreased mother-child activities (Enchautegui et al., 2015; Gracia & Kalmijn, 2016; Hepburn, 2018; Wight et al., 2008).³ To the extent that these personal and familial resources are beneficial for children's well-being, negative impacts of nonstandard work hours on these factors

¹ Note that these estimated independent associations between mothers' work schedules and child behavior could not exclude confounding from omitted pathway variables and/or other unobserved factors, and thus are likely not genuine direct linkages.

² Another potential mediating factor is childcare arrangement, which could be influenced by mothers' nonstandard work schedules (Enchautegui, Johnson, and Gelatt, 2015; Pilarz, Lin, and Magnuson 2019) and is also associated with child development (Bassok et al., 2016; Huston, Bobbitt, and Bentley, 2015). Although children may be cared at home informally by family members, relatives, babysitters/nannies, many of them experience out-of-home care at formal childcare centers. For this reason, this study does not view and examine childcare arrangements as part of the familial resources and processes.

³ But see Täht and Mills (2012) for increased parents-children activities associated with nonstandard schedules among couples in the Netherlands.

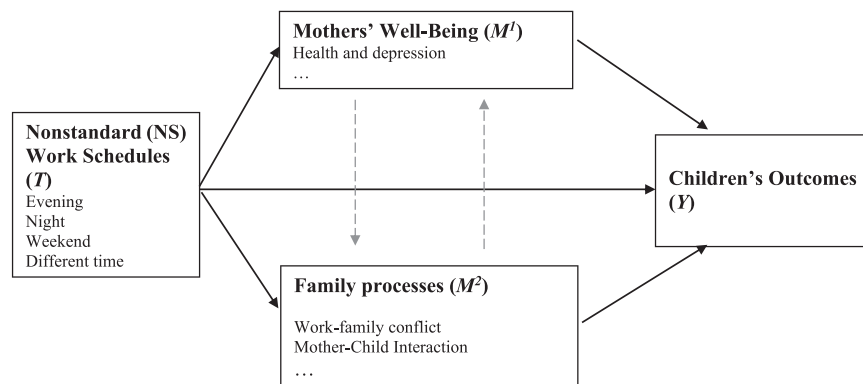


Fig. 1. Consequences of Mothers' Nonstandard Work Schedules on Children's Outcomes.

are likely to be transmitted to children and hinder their development, either in the short or long run (Strazdins et al., 2006).

Research suggests that the relationship between mothers' nonstandard work schedules and children's well-being may differ by the exact timing of how such work schedules occur (i.e., evenings, nights, weekends, and different times). Particular shift work, such as the night shift, places a heavier burden on mothers (also fathers) to keep healthy and spend high-quality time with children (Wight et al., 2008), which might be more detrimental to children's development than other schedules (Dunifon, Kalil, Crosby, and Su, 2013). Nonstandard schedules at evenings or weekends are usually out of sync with the working schedules of most other persons (including partners and other family members). Workers in such schedules have higher risks of missing children's homework, dinner, bedtime routines, and social activities/events, producing more work-family conflicts that negatively influence children (Laß & Wooden, 2022). Lastly, workers with irregular work shifts often lack control over their schedules and thus have more difficulties arranging childcare and establishing stable family routines conducive to healthy child outcomes.

To what extent nonstandard work schedules affect children also depends on whether these schedules reflect parents' preferences or requirements of their jobs and employers. Although for the most part nonstandard schedules are driven by societal-level forces (Enchautegui, 2013), some workers may choose to work nonstandard hours to balance work and family better and care for children (Garey, 1999; Wang & Raymo, 2021). In the latter situation, children's well-being could benefit from parents' flexible work time. Moreover, associations between nonstandard work schedules and child development could also vary by the specific outcome, the focal child's age, gender, the parent's gender, and family structure (for a comprehensive review, see Li et al., 2014).

2.2. Variation by maternal education

Despite the growing evidence documenting population-average detrimental impacts of nonstandard work schedules on children, little empirical research has explicitly examined whether maternal education stratifies such harmful influences on children and the broad implications for intergenerational transmission of (dis)advantage. Apart from the concentrated prevalence of nonstandard work schedules at the bottom of the education spectrum, both theories and empirical findings suggest differential links between nonstandard schedules and children's outcomes by maternal education. In particular, a "pattern of disadvantage" may exist where the direct and indirect effects of nonstandard work schedules on children might be more pronounced among those with less-educated mothers.

First, it is noteworthy that the nature of and reasons/situations in working nonstandard schedules could be highly variable by education. Some professional women with higher degrees (associate or bachelor) more often voluntarily take part-time or shift work to combine

motherhood and work demand by engaging in tag-team parenting (Enchautegui et al., 2015; Garey, 1999), whereas less-educated mothers are usually forced to work nonstandard shifts (Hsueh, 2006; Presser, 2003). Additionally, family-friendly work policies providing desired schedule flexibility are more available to workers with more skills and education. In contrast, employees with little human capital are least likely to receive and negotiate these policies from employers (Glass & Estes, 1997). These variations suggest that the nature and consequences of nonstandard work schedules might differ by education, where more-educated mothers and their children are less likely to encounter severe challenges posed by nonstandard work schedules (arrows pointing directly from T to Y differ by education, Fig. 1). However, many surveys do not ask detailed situations in working nonstandard schedules, and it is thus challenging to precisely measure and distinguish between these scenarios in empirical research.

Moreover, the impacts of nonstandard work schedules on children through mothers' health and well-being could vary by maternal education (arrows pointing from T to Y through M^1 differ by education, Fig. 1). A long line of research shows that educational attainment, as a critical component of SES, is one fundamental cause of health inequality (Link & Phelan, 1995; Phelan et al., 2004). Relative to individuals with higher education, those less educated are on average faced with higher risks of mortality and morbidity (Hayward, Hummer, and Sasson, 2015; Masters, Link, and Phelan, 2015), poorer physical and mental health (Cutler et al., 2015), and higher risks of depression (Miech and Shannah, 2000). To a large extent, these disparities reflect the disadvantages of less-educated people in multiple areas such as the labor market, health system, housing, lifestyles, and social networks. Furthermore, evidence shows that coping resources/strategies that people could utilize to mitigate shocks from adverse life events or chronic stressors (such as unemployment and low-quality jobs) are unequally distributed across the SES spectrum (Taylor & Seeman, 1999). For instance, educational attainment levels are positively associated with perceived instrumental support among working mothers in large U.S. cities (Su & Dunifon, 2017), indicating that mothers of higher education have more social resources to rely on when confronted with work challenges. These disparities suggest that relative to highly educated mothers, less-educated mothers have poorer health and fewer coping resources to protect themselves against potential drawbacks of working nonstandard schedules, resulting in larger negative impacts of such schedules on their own health and well-being and their children's development.

Lastly, the influences of nonstandard work schedules on children via family life and functioning processes could differ by maternal education (arrows pointing from T to Y via M^2 differ by education, Fig. 1). Abundant studies have documented substantial educational disparities in family behaviors where less-educated people engage more in behaviors that create more family instability and bring fewer (or even lose) resources for children, such as cohabitation, divorce, nonmarital birth and childrearing, and less investment on children (Kalil, Ryan, and

Corey, 2012; Kuo Lan, & Raley 2016; Lundberg, Pollak, and Stearns, 2016; McLanahan, 2004; Schneider et al., 2019; Schneider, Hastings, and LaBriola, 2018). These disparities constitute highly variable family environments where children grow up and take “diverging destinies” of development (McLanahan, 2004). Nonstandard work schedules may exert influences along the existing education divide by shaping and eroding family life to varying degrees across the educational distribution. Recent scholarship has suggested that people with higher socioeconomic status are better at managing potential challenges and negative influences of nonstandard work schedules for their family life (Gerstel & Clawson, 2018). Earlier studies report that children from working-poor families have larger unmet developmental needs and face greater risks of inferior development when parents work irregular schedules than children in middle-class and affluent families (Heymann, 2000). This gap in family income could broadly reflect educational disparities in how family life and processes are differentially influenced by nonstandard work schedules: highly educated mothers might be more capable of keeping everyday family routines and maintaining parent-child interactions when they work nonstandard schedules. By contrast, mothers with less education often experience greater difficulty juggling between family and job needs without much help when working nonstandard hours (Yoshikawa et al., 2006). These disparities partially contribute to more pronounced negative impacts of nonstandard work schedules on outcomes among children with less-educated mothers.

To summarize, nonstandard work schedules may impede children’s development in either direct or indirect pathways, resulting in an overall “pattern of disadvantage” characterized by worse impacts on children with less-educated mothers. Nevertheless, this pattern is by no means monolithic, but may depend on different nonstandard work schedules. For instance, prior studies have documented a host of unique challenges linked to night schedules for both mothers and children (Dunifon, Kalil, Crosby, and Su, 2013; Su & Dunifon, 2017), and the “pattern of disadvantage” may be amplified in night schedules if children with less-educated mothers are particularly vulnerable when mothers mainly work at nights. Alternatively, the “pattern of disadvantage” may attenuate when considering work schedules that occur at different, often unpredictable times, which could negatively impact all mothers regardless of education. By contrast, shocks from work schedules at fixed, more predictable timing could be more efficiently mitigated by highly educated mothers than their less-educated counterparts. These possibilities emphasize the importance of considering the exact timing of mothers’ nonstandard work schedules in empirical analyses.

2.3. The current study

This study assesses associations between mothers’ nonstandard work schedules and children’s behavior problems and how these associations vary by levels of maternal education. By examining different kinds of mothers’ nonstandard work schedules – shift work that occurs at evenings, nights, weekends, and at different times – my analyses help unpack the complexity where the observed educational gradients may differ by the specific schedule timing.

By answering the above questions, this study moves beyond previous research and illustrates divergent patterns by maternal education in the implications of nonstandard work schedules for children’s behavior development. My finding that a general “pattern of disadvantage” exists in the relationships between mothers’ nonstandard work schedules and children’s behavior problems suggests that disadvantages of children with less-educated mothers are compounded as they experience a higher prevalence of mothers’ nonstandard work schedules as well as worse impacts from such work schedules.

3. Data, variables, and analytical strategy

3.1. Data and Sample

Data come from the Future of Families and Child Wellbeing Study (FFCWS), a longitudinal survey following a birth cohort of 4898 children born between 1998 and 2000 in 20 U.S. cities with populations greater than 200,000 (Reichman et al., 2001). By oversampling unmarried births, a quarter of children in the FFCWS sample were born to married parents, and the remaining three-quarters of children were to unmarried parents. This feature provides a unique opportunity for the current study to carefully examine the work and family life of disadvantaged mothers with low income and less education, a group that disproportionately works nonstandard and unpredictable schedules (also see potential drawbacks in discussion). Interviews with both mothers and fathers were conducted at the child’s birth (baseline) as well as when children were 1, 3, 5, 9, and 15 years old. The parent interviews collect rich information about parents’ attitudes, relationships, parenting behavior, demographic characteristics, health, economic and employment status, as well as neighborhood characteristics. The child survey took place in the home when children were at age 9, and by telephone or in the home at age 15 (see more information at <https://fragilefamilies.princeton.edu/documentation>).

Unlike surveys that require respondents to indicate whether they work either a standard or a nonstandard schedule, such as the Current Population Survey (CPS), one unique feature of the FFCWS is that it allows mothers to indicate whether they work more than one type of work schedule (i.e., both standard and nonstandard work times). This question design captures more precisely the fact that many disadvantaged mothers of young children regularly work at both standard and nonstandard times, thus having advantages in measuring the prevalence of nonstandard work schedules than those mutually exclusive conceptualizations (Dunifon, Kalil, Crosby, Su, and DeLeire, 2013).

The wave-to-wave retention rate of the FFCWS has been relatively high, ranging from 84.92% to 97.83% across time. At the 1-, 3, 5, 9, and 15-year follow-up surveys, the proportions of all the 4898 children and their mothers interviewed were 89.10%, 86.38%, 84.50%, 71.76%, and 64.23%. Information from the baseline and 1-year survey interviews was used to construct time-constant covariates. Time-varying covariates were created from waves 3–6 in which mothers were asked consistent questions of work schedules when the focal child was aged 3, 5, 9, 15 years old. The analytical sample is limited to children who lived with mothers for all or most of the time⁴ and whose mothers were interviewed at least twice during waves 3–6 ($N = 4113$). Of all these respondents, those who have non-missing data on the dependent variable and have complete information on all covariates (removed $n = 565$, 11.5%) were kept in the analytical sample. The final sample includes 3548 focal children contributing to 10244 person-wave observations. Descriptive statistics indicate that the final analytical sample does not differ substantially from the original sample (also a less restricted sample), with slightly more mothers of higher education, Whites, married families, homeowners, and fewer immigrants and families in poverty or near poverty (see Online Table A1). Among these children, 1142 (32.2%) were born to mothers without a high school degree and contributed to 3123 observations, 2007 (56.5%) were born to mothers with a high school and some college and contributed to 5923 observations, and the remaining 399 (11.2%) were born to mothers completed college and contributed to 1198 observations. Following prior practice, descriptive statistics were weighted using city sampling weight to make the sample representative of births in large U.S. cities, and multivariate analyses were unweighted because regression models include key characteristics for which the weights adjust (i.e., marital status at birth,

⁴ This restriction does not reduce the number of children but only decreased 4.1% of all the observations.

age, race, and education) (Bzostek & Berger 2017; Carlson, VanOrman, and Turner., 2017; Pilarz, Ros et al., 2020).⁵

3.2. Measures

3.2.1. Children's behavior problems

The focal child's behavioral problems were measured at waves 3, 4, 5, and 6. These measures were derived from the behavioral, emotional, and social problems scales of the Child Behavioral Checklist (CBCL) (Achenbach & Rescorla, 2000), where mothers responded to a series of items that pertain to their children's externalizing and internalizing problem behaviors. Each item consists of a three-point Likert scale on which mothers reported whether the focal child's behavior is "not true (0)," "sometimes or somewhat true (1)," or "often or very true (2)." Externalizing behavioral problem was measured by the sum of the aggressive and rule-breaking behavior subscales (α ranges from 0.86 to 0.91 across waves), and the internalizing behavioral problem was measured by the sum of the anxious/depressive and withdrawn behavior subscales (α ranges from 0.75 to 0.84 across waves).⁶ Without prior theoretical expectations about how mothers' work schedules would be differentially related to externalizing and internalizing behaviors, in each wave a total score of externalizing and internalizing behavioral problems was summed over all items and then standardized to have a mean of 0 and a standard deviation (SD) of 1, with higher values indicating more behavioral problems. Separate results by externalizing and internalizing behaviors yield similar patterns and are discussed in the results section.

3.2.2. Mothers' nonstandard work schedules

During waves 3–6, mothers were asked about their work schedules: "At your primary job, do/did you regularly work...?" Options include "Weekdays," "Evenings (6 pm – 11 pm)," "Nights (11 pm–7 am)," "Weekends," or "Different times each week."⁷ In all waves, these options are not mutually exclusive, and respondents could select more than one option. For this analysis, I utilized information on the work schedules of mothers who were currently working at the time of the interview, although unemployed mothers also answered this question and reported their work schedules in previous jobs.

Following prior practice (Dunifon, Kalil, Crosby, and Su, 2013), I constructed four dummy variables indicating whether an employed mother reported working at a) evenings, b) nights, c) weekends, and d) different times each week, with 1 indicating the mother currently working a specific type of nonstandard schedule and 0 indicating a mother currently working other types of schedules or not employed (the reference category). Note that this coding could capture multiple combinations, including mothers working a particular type of nonstandard

⁵ I used random and fixed effects regression models where the former generally does not allow for weights and the latter only allows for constant weight (maximum-likelihood random effects regression also only allows for constant weight). The FFCWS does not release longitudinal weights and the available sampling weights vary wave by wave. In auxiliary analysis, I used the baseline city sampling weights in fixed effects regression and results yielded stronger educational gradients in the relationships between mothers' nonstandard work schedules and child behavior (available upon request).

⁶ Detailed items can be found in the User's Guides provided by the FFCWS team: Table 29 in User's Guide for Year 3, Table 28 in User's Guide for Year 5, Year 9 Documentation for CBCL Subscales (modified version, provided by the FFCWS upon additional request), and Table 18 in User's Guide for Year 15. User's guides for each wave can be accessed at <https://fragilefamilies.princeton.edu/data-and-documentation/public-data-documentation>.

⁷ Although the FFCWS also asked mothers' occasional work schedules ("At your primary job, do/did you sometimes also work...?"), information on mothers' regular work schedules was used in this analysis, as children's behavior outcomes are likely to be influenced to a larger extent by mothers' frequent work schedules than those on an occasional basis.

schedule either in isolation or in combination with other types of nonstandard schedules (that is, a respondent could be counted twice or more when creating these indicators). Therefore, these four dummy variables are not mutually exclusive and can capture mothers' exposure to multiple nonstandard schedules. These measures reflect the complexity and multiplicity of types of women's work schedules in the FFCWS sample.

When being included in the same regression model, for each dummy indicator of nonstandard schedule (e.g., evening work), the reference category is simply all mothers not working that specific nonstandard schedule (e.g., not working evenings), including mothers working other schedules and those who were not employed at the time of the survey. Given the fact that nonstandard schedules are highly prevalent and often unstable, all mothers could be at risk of being exposed to a certain type of nonstandard schedule—regardless of the duration—throughout their working lives, including those currently not employed but could be working nonstandard times either in the past or in the future.⁸ Counting currently unemployed mothers in the reference category is thus meaningful and echoes the recent call to incorporate information about individuals' previous labor force dynamics to ensure an inclusive measurement of precarious or nonstandard work (Alon, 2023). Nevertheless, to capture potential differences between employed and unemployed mothers, I included a dummy indicator denoting whether a mother was not employed at the time of the survey (1 = not employed) and its interaction with maternal education (see below) in the multivariate analysis.

3.2.3. Maternal education

Mothers' education level was a time-constant variable asked at the baseline, measured with four categories including less than a high school degree, high school degree or General Equivalency Degree, some college or technical school, or a college degree and above. The two categories at the middle were collapsed, and a three-category of maternal education was used in the analyses: less than high school, high school or some college, and college and above. This operationalization is consistent with prior studies (Conwell & Doren, 2020), in which three educational groups correspond to what family scholars have conceptualized as "the truly disadvantaged," "the moderately advantaged," and "the truly advantaged" in terms of the relationship between educational attainment and family characteristics (Cavanagh & Fomby, 2019).

3.2.4. Covariates

An extensive set of covariates was included in the analyses to account for potential confounding between mothers' nonstandard work schedules and children's behavioral problems. Time-constant covariates include maternal, paternal, and child characteristics, measured at the baseline wave. Mother's characteristics included race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, and other), immigration status (1 = immigrant, 0 = otherwise), age at first birth (in years), and whether living with parents at age 15 (1 = yes, 0 = otherwise). Biological fathers' characteristics included race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, and other) and educational attainment (less than high school, high school or some college, and college and above). The focal child's characteristics consist of gender

⁸ In the analytical sample, almost 60% of currently unemployed mothers reported working nonstandard schedules in their previous jobs; about 50%–65% of mothers who were unemployed at a certain wave t changed into some nonstandard jobs at the next wave $t + 1$.

⁹ The term "truly disadvantaged" was first coined by William Julius Wilson in his famous book examining race, employment, and poverty in American inner-city ghettos (Wilson, 1987). Recent research on the growing bifurcation/trifurcation of the American family system has borrowed this term to emphasize disadvantages in family behaviors and life chances of the least-educated (without high school education) adults and their children.

(1 = boys, 0 = girls), firstborn status (1 = yes, 0 = no), and low birth weight status (1 = less than 2500 g, 0 = otherwise).

An array of critical time-varying covariates that covary with mothers' nonstandard work schedules and children's behavioral outcomes was further controlled for. Mothers' reported time-varying covariates included family structure (married to biological father, married to social father, cohabiting with biological father, cohabiting with social father, and single), work hours per week, living with parents (i.e., coresiding with the child's grandparents) (1 = yes, 0 = no), number of children in the household, household poverty status (poverty, near poverty, and no poverty), and homeownership (1 = owned, 0 = rented/other). Including family structure, coresidence with parents, and poverty help eliminate potential confounding from family, household, and economic instability that simultaneously influence mothers' employment patterns and children's development (Hill et al., 2017; Lee & McLanahan, 2015; Perkins, 2019). Father's incarceration status (reported by mothers) indicating whether the father had ever been in jail in each wave (1 = yes, 0 = no) was also considered, a factor that increases children's antisocial behaviors (Haskins, 2015).

3.3. Analytical strategy

Two analytic techniques for panel data, random and within-child fixed effects regressions, were used to adjust for observable and unobservable characteristics that confound the relationship between nonstandard work schedules and children's outcomes. Random effects models use variation both between and within children and include both time-constant and time-varying variables. In contrast, fixed effects models use variation only within children over time to examine how changes in mothers' work schedules are associated with changes in children's behavior outcomes, controlling for time-varying covariates (time-constant variables are automatically dropped). For each analytical approach, one additive model was first estimated to assess how mothers' nonstandard work schedules were associated with children's behavioral outcomes in the overall sample, and a second model with interactions between mothers' work schedules and education was estimated to evaluate the educational gradient in such associations. To illustrate, the two models estimated using fixed effects models could be expressed as follows.¹⁰

$$Y_{it} = \alpha_0 + \alpha_1 NS_{it} + \alpha_2 UE_{it} + \gamma TC_{it} + \alpha_i + u_{it}, \tag{1}$$

In this additive model, Y_{it} , the focal child i 's behavior problems at wave t (3, 4, 5, and 6) is a function of a measure of mothers' nonstandard work schedules (NS_{it} , different types of nonstandard work schedules), whether unemployed (UE_{it}), a vector of time-varying covariates (TC_{it}), the unobserved, time-constant child-specific characteristics (α_i), and the error term (u_{it}). Maternal education and other time-constant covariates were also controlled in the fixed effects model but were automatically dropped (they were estimated in random effects regression).

The interactive model added interaction terms between mothers' nonstandard work schedules (and unemployment) and maternal education, as shown below:

$$\begin{aligned} Y_{it} = & \beta_0 + \beta_1 NS_{it} + \beta_2 NS_{it} \times Medu1 + \beta_3 NS_{it} \times Medu2 \\ & + \beta_4 UE_{it} + \beta_5 UE_{it} \times Medu1 + \beta_6 UE_{it} \times Medu2 \\ & + \lambda TC_{it} + \alpha_i + \varepsilon_{it}, \end{aligned} \tag{2}$$

For the research interest, β_1 denotes coefficients of mothers' nonstandard work schedules among the "truly disadvantaged group," children with mothers without a high school degree; β_2 and β_3 indicate differences in the coefficients of nonstandard work schedules across

educational groups. $\beta_1 + \beta_2$ and $\beta_1 + \beta_3$ represent the associations between mothers' nonstandard schedules and behavioral problems among children of mothers with high school and some college and mothers with at least a college degree, respectively.

By assuming the error term is uncorrelated with each independent variable in all time periods (a very strict assumption itself), random effects models include time-constant variables over time and help estimate between-child variation, one advantage over fixed effect regression (Wooldridge, 2012). By allowing for the correlation between the error term and any independent variables over time, fixed effects regression helps rule out unobserved confounding that does not vary across time (α_i), but its estimation may still be biased in the presence of any omitted time-varying variables that are correlated with both mothers' nonstandard schedules and children's behavioral outcomes, a dynamic relationship between mothers' work schedules and children's behavioral outcomes, and misspecified functional forms of regression models.

Comparison across the two approaches could enhance our understanding of the linkages between mothers' nonstandard schedules and children's behaviors. However, the Hausman tests indicated fixed effects models are preferred over random effects models; more discussion is therefore provided for the fixed effects estimations. In our analytical sample, 49.2% of all mothers had changed between standard only and any nonstandard work schedules during waves 3–6, and between 19.2% and 48.9% of mothers had variations in their specific nonstandard schedule. However, the variation in mothers' work schedules is likely to be underestimated in the FFCWS, particularly given the 4- and 6-year gaps between later waves (from ages 5–9 and ages 9–15).

4. Results

4.1. Descriptive results

Among the analytical sample, a total of 31% of observations reported regularly working certain nonstandard schedules: 13% had worked in the evenings; 22% worked on weekends, and around 15% worked at different times; The night schedules were much less frequent (about 6%) compared with other types of nonstandard schedules. Note again that these different types of nonstandard schedules happened either in isolation or in combination with other nonstandard schedules, but variation across types nonetheless reveals the differential prevalence of each of them.

Table 1 presents descriptive statistics for children's behavior problems, maternal education, and other covariates between children whose mothers worked a certain type of nonstandard schedule (Columns 1, 3, 5, and 7) and their peers of mothers not working such a schedule (Columns 2, 4, 6, and 8). For each type of nonstandard schedule, comparison between subgroups of children reveals significant disparities in child behavior, maternal education, and other characteristics of mothers, fathers, and the focal child, indicating substantial selection into nonstandard work by various individual and family characteristics. For behavior problems, children of mothers not working nonstandard times (the reference groups) exhibited fewer problems than average, a pattern consistent across types of nonstandard schedules. Compared with these children, those whose mothers worked nonstandard schedules had more behavioral problems above the average, and differences are significant for night and weekend schedules ($p < 0.001$ and $p < 0.01$, respectively). More specifically, without conditioning on other covariates, children whose mothers worked at night appeared to have the most problems, followed by those with mothers working at weekends or different times and those whose mothers worked in the evenings. Patterns for externalizing and internalizing behaviors were largely consistent with the overall scale, except that disparities in behavior problems between subgroups of children tended to be more pronounced for externalizing behaviors.

Under each type of nonstandard schedule, mothers who were not

¹⁰ Corresponding equations for the random effects model have time-constant covariates. To save space, these equations are omitted here.

Table 1
Weighted descriptive statistics by mothers' nonstandard work schedules.

	Evenings		Nights		Weekends		Different times	
	Yes	No	Yes	No	Yes	No	Yes	No
Dependent variable								
Child behavior problems (CBCL)	0.05 (1.03)	-0.02 (0.99)	0.17 * ** (1.17)	-0.02 (0.98)	0.07 * * (1.04)	-0.04 (0.98)	0.07 (1.03)	-0.02 (0.99)
Covariates								
<u>Mothers' characteristics</u>								
Education (%)								
Less than high school	31.97	25.79	32.43	26.68	30.49	25.44	29.15	26.59
High school & some college	48.31	53.90	51.46	52.71	55.14	51.19	50.79	53.20
College and above	19.72	20.31	16.11	20.61	14.37	23.37	20.05	20.21
Race/ethnicity (%)								
White	29.78	30.66	21.35	31.43	26.36	32.72	29.92	30.64
Black	38.14	33.96	47.90	33.55	44.45	29.69	41.42	32.76
Hispanic	25.66	29.35	20.91	29.30	24.51	30.68	22.63	30.46
Other	6.42	6.02	9.84	5.72	4.68	6.91	6.03	6.15
Immigrant (%)								
Age at first birth	20.94 (6.15)	24.46 (5.97)	24.08 (5.24)	23.59 (6.09)	20.94 (5.75)	25.13 (6.10)	20.40 (6.13)	24.72 (5.98)
Living with parent at age 15 (%)								
Family structure (%)								
Married-biological	45.66	50.63	39.06	50.59	41.49	53.88	47.59	50.10
Married-social	3.07	5.82	6.06	5.09	5.58	4.96	4.52	5.40
Cohabiting-biological	9.99	8.53	10.72	8.67	9.88	8.31	9.90	8.52
Cohabiting-social	8.81	7.25	8.29	7.54	9.11	6.78	8.05	7.46
Single	32.48	27.77	35.88	28.12	33.94	26.07	29.94	28.51
Work hours per week								
	36.71 (13.79)	32.54 (14.89)	38.72 (13.70)	32.96 (14.75)	37.83 (13.38)	31.14 (14.92)	34.97 (14.00)	33.03 (14.96)
Living with parent (coresidence) (%)								
Number of children	12.83 (1.30)	9.59 (1.31)	11.67 (1.41)	10.20 (1.30)	15.23 (1.32)	7.65 (1.31)	12.03 (1.27)	9.78 (1.32)
Poverty status (%)								
Poverty	37.05	30.06	40.28	30.77	37.05	28.73	39.05	29.22
Near Poverty	22.97	22.55	22.24	22.69	24.02	21.89	20.53	23.36
No poverty	39.99	47.39	37.47	46.54	38.93	49.38	40.42	47.43
Homeownership (%)								
	17.46	23.90	15.74	23.11	16.84	25.46	18.08	23.85
<u>Fathers' characteristics</u>								
Race/ethnicity (%)								
White	28.33	29.17	22.48	29.67	23.45	32.01	27.19	29.57
Black	36.46	34.43	44.67	33.86	43.64	30.08	40.19	33.13
Hispanic	29.94	31.06	27.58	31.15	29.14	31.72	28.08	31.72
Other	5.27	5.34	5.27	5.33	3.76	6.19	4.54	5.59
Education (%)								
Less than high school	31.63	25.58	34.22	26.22	33.36	23.48	31.18	25.59
High school & some college	47.58	49.86	50.00	49.26	47.42	50.39	46.00	50.45
College and above	17.93	22.45	12.55	22.34	16.62	24.03	19.87	21.91
Ever incarcerated (%)								
	32.08	27.05	33.32	27.68	34.37	24.84	31.07	27.27
<u>Child characteristics</u>								
Boy (%)	54.03	55.93	51.69	55.90	54.40	56.09	56.76	55.06
Firstborn (%)	38.21	38.19	39.34	38.07	38.46	38.05	40.88	37.29
Low birth weight								
Total N of children	7.99	6.99	9.40	6.99	7.93	6.84	8.08	6.94
Total N of observations	3548							
	10244							

Notes: All figures are weighted by city sampling weights. Unweighted total numbers of children and observations are reported. Percentages are reported for categorical variables. Means and standard deviations (in parentheses) are reported for continuous variables.

Dummy indicators of nonstandard work schedules are not mutually exclusive. Statistically significant differences in behavior problems between children of mothers working a certain nonstandard schedule ("Yes" columns) and those of mothers not working such a schedule ("No" columns, reference groups) are marked with stars. Covariates that differ significantly across subgroups of children by mothers' work schedule are highlighted in bold.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (two-tailed tests).

working such a schedule had higher levels of education, with over a fifth holding a college degree and above and more than half completing high school and some college. By contrast, almost a third of mothers working nonstandard times did not have a high school degree, and fewer finished high school and some college (except for weekend work), a pattern consistent across types of nonstandard schedules. Interestingly, mothers working evenings or different times had similar proportions holding a college degree (probably reflecting the fact that some mothers with standard work also worked evenings or rotating schedules) with those who did not, while mothers working nights and weekends had lower percentages of completing a college education compared to their peers not in such schedules.

Consistent with previous research (Dunifon, Kalil, Crosby, and Su, 2013), Table 1 also reveals stark differences in other time-constant and time-varying characteristics of the child's mother and father between children whose mothers worked nonstandard times and those whose mothers did not. In general, children with mothers in a specific type of nonstandard schedule (relative to those whose mothers did not work such a schedule) were significantly disadvantaged in a variety of parental socioeconomic characteristics, with higher proportions of them living in cohabiting and single-mother families, exposed to poverty and rental households, and having less-educated fathers with more incarceration experiences. These substantial differences highlight the importance of adjusting for these covariates in multivariate analyses.

Table 2 compares the unadjusted mean values of child behavior by mothers' work schedules and education, providing initial support for a "pattern of disadvantage" in the influences of mothers' nonstandard work schedules on children. Regardless of work schedules, children of college-educated mothers consistently fared best in behavioral development, and children's behavioral problems increased as their mothers' education decreased. Comparisons by work schedules within education groups show that, relative to those whose mothers were not working nonstandard schedules, children of mothers without a college degree exhibited significantly more behavior problems when mothers worked nights, weekends, and different times (Columns 2 and 3). By contrast, children of college-educated mothers had worse behavior outcomes when mothers worked weekends and at different times, but their behavior problems were still below the average level (Column 4). However, whether this pattern still holds when comparing children of mothers with different education but otherwise similar characteristics requires multivariate analyses considering disparities in various time-constant and time-varying covariates.

4.2. Regression results

Table 3 presents selected results from fixed effects regressions, where the first column reports additive model results (Model 1) and the second column reports interactive model results (Model 2). Random effects regression estimations that reveal similar patterns are discussed, and corresponding results are included in the online appendix (Table A2) to save space.

First, additive model results of random effects regression show that among all children, those whose mothers worked nonstandard work schedules had significantly more behavioral problems than children whose mothers not working such standard schedules (the reference groups), holding other characteristics constant. This net difference ranged from 0.06 SD for night schedules ($p < 0.05$) to 0.04 SD for schedules at weekends ($p < 0.05$). The coefficient of working at different times each week is also positive but insignificant. However, these coefficients for nonstandard work schedules in the fixed effects regression

Table 2

Unadjusted means and differences in children's behavioral problems across mothers' work schedules by maternal education.

	Total sample	Less than high school	High school & some college	College and above
NS schedules at evenings				
Yes	0.055	0.192	0.017	-0.076
No	-0.017	0.114	-0.010	-0.198
Difference	0.071 **	0.079	0.027	0.122
NS schedules at nights				
Yes	0.168	0.368	0.155	-0.191
No	-0.018	0.105	-0.021	-0.169
Difference	0.186 ***	0.263 ***	0.176 ***	-0.022
NS schedules at weekends				
Yes	0.069	0.165	0.045	-0.044
No	-0.038	0.116	-0.034	-0.213
Difference	0.106 ***	0.049	0.079 **	0.169 **
NS schedules at different time				
Yes	0.067	0.254	0.017	-0.078
No	-0.022	0.091	-0.012	-0.202
Difference	0.090 ***	0.162 ***	0.029	0.124 *
Number of children	3548	1142	2007	399
Number of observations	10,244	3123	5923	1198

Notes: All figures are weighted by city sampling weights. Unweighted numbers of children and observations are reported.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (two-tailed tests)

Table 3

Fixed effects regression results for relationships between mothers' nonstandard work schedules and children's behavior problems.

	Model 1	Model 2
Mothers' work schedules		
NS work schedule at evenings	0.024 (0.028)	0.091 (0.047)
NS work schedule at nights	0.012 (0.036)	0.162 * (0.067)
NS work schedule at weekends	0.003 (0.026)	0.056 (0.049)
NS work schedule at different time	-0.008 (0.027)	0.099 * (0.049)
Not employed	0.028 (0.026)	-0.062 (0.047)
Maternal education (ref.: Less than high school)		
HS and some college	Dropped	Dropped
College and above		
Interaction with maternal education		
NS work schedule at evenings X HS and some college		-0.085 (0.059)
NS work schedule at evenings X College and above		-0.237 * (0.110)
NS work schedule at nights X HS and some college		-0.202 * (0.083)
NS work schedule at nights X College and above		-0.382 * * (0.132)
NS work schedule at weekends X HS and some college		-0.077 (0.059)
NS work schedule at weekends X College and above		0.220 ** (0.084)
NS work schedule at different time X HS and some college		-0.222 *** (0.060)
NS work schedule at different time X College and above		0.055 (0.078)
Not employed X HS and some college		0.034 (0.056)
Not employed X College and above		0.117 (0.077)
Number of children	3548	3548
Person-year observations	10,244	10,244

Notes: Data come from waves 3–6 of the FFCWS when the focal child was aged 3, 5, 9, 15 years old. All models include time-invariant and time-varying covariates as listed in Table 1. Full results are available upon request.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (two-tailed tests)

accounting for unobserved time-constant factors become smaller and insignificant. Changes in results across models suggest that there appear to be unobserved time-invariant factors that selected mothers into specific types of nonstandard work schedules and increased children's problematic behavior, leading to somewhat upwardly biased random effects estimations.

The insignificant results in fixed effects regressions are consistent with prior research on mothers' work schedules and children's behavior problems using the same data (only age 3 and 5 waves) (Dunifon, Kalil, Crosby, and Su, 2013). Although this differs from earlier findings using other longitudinal datasets and fixed effects regression (e.g., Han, 2008),¹¹ the discrepancy probably reflects differences in survey samples and measurements of behavior problems and nonstandard schedules.

Second, interactive models from random and fixed effects regressions are largely consistent in revealing divergent patterns by maternal education in relationships between nonstandard work schedules and children's behavioral problems, with fixed effects estimates producing more pronounced comparisons. Overall speaking, among children of mothers without high school education, mothers' working

¹¹ Using data from the National Longitudinal Survey of Youth-Child Supplement and the child fixed effects regression model, Han (2008) reported mothers' longer years of working shift work significantly contributed to children's increased behavioral problems (antisocial behavior, anxiety/depression, headstrongness, hyperactivity, immaturity, and dependency).

nights and different times each week were significantly associated with more behavior problems (0.16 and 0.10 SD, respectively in the fixed effects model). The significant positive association between mothers' night schedules and children's behavior problems disappeared among the other two groups of children with more-educated mothers. Children with college-educated mothers had decreased behavior problems when their mothers regularly worked nights (marginally significant). Interestingly, the positive relationship between mothers' working different times with children's behavior problems lost significance for those whose mothers had high school or some college but remained significant for children with the most-educated mothers.

On the other hand, the positive relationship between mothers regularly working evenings and behavior problems was only marginally significant among children with the least-educated mothers (0.09 SD). Such a positive relationship became negligible among children whose mothers had high school and some college and even negative (but insignificant) among those with college-educated mothers. Finally, mothers' weekend schedule was unrelated to more behavior problems among the two groups of children with less-educated mothers, but children with college-educated mothers tended to display worse behavior development when their mothers regularly worked weekends.

Prior studies reported largely consistent patterns (with certain differences) in the overall associations between mothers' nonstandard work schedules and children's internalizing and externalizing behavior (Dunifon, Kalil, Crosby, and Su, 2013). Additional analysis looking separately at children's externalizing and internalizing behavior illustrates that the educational gradients regarding how mothers' nonstandard work schedules influence children were evident for both dimensions. Nevertheless, educational gradients for the evening, night, and weekend work appeared more pronounced in children's internalizing behavior than externalizing behavior, but the opposite pattern was true for work schedule at different times (see Online Table A3).

5. Discussion

Increasing evidence has demonstrated that nonstandard work schedules are more prevalent among the less-educated population, and mothers' nonstandard work schedules adversely influence children's development. Yet, we have known relatively little about how such impacts differ across the educational distribution. Focusing on children's behavior development, a crucial component of non-cognitive skills, this study revealed interesting variations by maternal education in the relationships between mothers' working nonstandard hours and children's behavior problems. First of all, an overall "pattern of disadvantage" existed in the sense that increased behavior problems related to mothers' nonstandard schedules were concentrated among children born to mothers who did not have a high school degree, a "truly disadvantaged" group in contemporary America (Cavanagh & Fomby, 2019; Cheriin, 2014). Second, children of mothers with high school and some college education did not manifest significantly more behavioral problems when their mothers regularly worked nonstandard schedules. Third, among children who had college-educated mothers, nonstandard schedules appeared to play a mixed role in their behavioral development, depending on the specific type of nonstandard schedule.

Among children with the least-educated mothers, although all types of nonstandard work schedules were associated with their worse behavior outcomes, mothers' night work appeared to be particularly detrimental compared with other schedules. This finding is consistent with prior studies stressing unique challenges for mothers and children posed by night shift that are not evident for other schedules, including mothers' poorer sleep, worse physical and mental health, weaker perceived support (Knutsson, 2003; Su & Dunifon, 2017; Wight et al., 2008), and children's increased risky behaviors (Dunifon, Kalil, Crosby, and Su, 2013; Gassman-Pines, 2011; Han et al., 2010). This emphasizes important heterogeneity related to different types of nonstandard work hours when considering their implications for children's outcomes.

Among children with the most-educated mothers, mothers' night and evening hours tended to be related to their fewer behavior problems. This suggests that highly educated mothers might choose the evening or night shift to practice tag-team parenting and thus benefit their children's behavioral development (Enchautegui et al., 2015; Garey, 1999). Quite differently, mothers regularly working weekends or different times each week was related to more behavior problems in children, with comparable or even larger magnitudes relative to the least-educated group. Rotating schedules at different times are likely to be those with considerable unpredictability and little schedule control, which might exert similarly negative impacts on advantaged mothers and children despite their more education. The detrimental influence of regular weekend work on children may reflect mothers' difficulties in organizing family/social activities and experiences of more work-family conflicts (Laß & Wooden, 2022). This varied role of nonstandard schedules for child behavior calls for more attention to the nature and circumstances of mothers taking such schedules, especially among the highly educated group.

Although no significant relationships were detected between nonstandard schedules and child behavior among children of mothers with high school and some college education, it would be too early to conclude that this group of children is immune to potential drawbacks of mothers working nonstandard hours. This study only examined externalizing and internalizing behaviors, while other behavior functioning measures (including substance abuse, delinquency, and even crime) and other important life outcomes (such as high school dropout and college attendance) at later stages of adolescence and young adulthood might still be impacted by mothers' nonstandard work schedules among children of mothers with middle-level education.

Why are children of mothers at the bottom of the education spectrum especially vulnerable to nonstandard work schedules? Explorative comparisons in mothers' well-being and family dynamics by work schedules across educational groups (see Online Figure A1) revealed that least-educated mothers not only appeared to have worse physical and mental health but experienced elevated work-family conflicts on multiple dimensions (such as job-related stress and childcare problem) when worked nonstandard hours. By contrast, differences in health conditions between working vs. not working nonstandard schedules were much less pronounced among mothers with high school and some college education. On the other hand, mothers with college degrees were in much better health conditions that helped them weather impacts – often less severe – from nonstandard schedules. Nonstandard work schedules enabled them to enjoy more work-family flexibility (particularly for evening and night work, available upon request). Meanwhile, these advantaged mothers also experienced more job-related stress and childcare problems when working nonstandard hours (particularly for weekend work, available upon request). These disparities in mothers' well-being and family processes may help account for observed divergent patterns in the associations between mothers' nonstandard work schedules and children's behavioral outcomes. Future studies should investigate how the above factors (and maybe other mechanisms) mediate the impact of nonstandard schedules on children's outcomes among different education groups.

This study is not without limitations, pointing to possible directions for future research. One is that respondents of the FFCWS survey have not been interviewed on a regular monthly or yearly basis, which could not fully capture frequent changes in mothers' nonstandard work schedules over time. This survey design leads to an underestimation of variation in mothers' nonstandard schedules. Second, different types of nonstandard work schedules examined in this study were experienced by mothers in isolation or combination with other nonstandard work schedules. Due to the complex and unstable work situation of low-educated mothers, it is common for these mothers to work multiple jobs that involve different work schedules at the same time (Bruns & Pilkauskas, 2020). Third, nonstandard shift work is often inferior, low-quality in other essential aspects, including low pay, high income

uncertainty, fewer benefits, minimal schedule control, instability, and autonomy (Kalleberg, 2011; Schneider & Harknett, 2019, 2022). These omitted factors of job quality might play a critical role in explaining increased behavior problems related to nonstandard schedules, especially among children of the least educated mothers with higher exposure to low-quality jobs. Although this analysis could not include many precise job quality measures due to data limitation, supplemental regression analysis including proxies of mothers' hourly wage and primary occupation groups yielded similar findings (see Online Table A4).

Besides, findings from this study are based on a birth cohort in large U.S. cities and may not be generalized to other geographic areas. In particular, low-income and less-educated unmarried mothers are over-represented in the FFCWS sample. Although this provides a unique opportunity to carefully examine the work and family lives of disadvantaged mothers and their children, it might lead to less-precisely estimated associations between nonstandard schedules and child behavior among relatively smaller numbers of children with more-educated mothers compared with nationally representative samples. Another concern is that maternal education was treated as a time-constant variable that did not vary as children grew up. If lower-educated mothers increased their educational attainment after childbirth, which tends to increase children's behavior problems (Harding [2015], but see Augustine and Negraia [2017]), then disparities in associations between mothers' work schedules and child behavior by maternal education might be underestimated.

Despite these limitations, this study advances our understanding of how nonstandard work schedules produce diverse influences on children across the educational distribution in an era of growing insecurity. Children born to genuinely disadvantaged mothers without a high school degree are exposed more to the potential drawbacks of nonstandard work schedules. Recent evidence reports narrowing education gaps in mothers' parenting time that may lead to a shrinking educational gradient in associations between mothers' nonstandard schedules and child well-being (Prickett & Augustine, 2021). However, such an educational gradient is likely to remain substantial or even widen in recent years, given the fact that employment conditions of low-SES mothers and families were hit harder by but recovered much slower from the Great Recession (Kalleberg and von Wachter, 2017), and that the recent COVID-19 pandemic has worsened existing socioeconomic gaps in job quality, childcare, parental well-being, school resources and children's outcomes (Doyle, 2020; Kalluri, Kelly, and Garg, 2021; Lyttelton & Zang, 2022; Terrier, Chen, and Sutter 2021).

Last but not least, negative implications of nonstandard work schedules for children's wellbeing are hardly a phenomenon limited only to the bottom of the education spectrum, but rather penetrating in the sense that specific nonstandard schedules are also detrimental for children with more-educated mothers. This indicates the pervasiveness of difficulties experienced by all mothers in reconciling work-family responsibilities and dealing with work-related stress when working nonstandard hours. All these point to the importance of increasing access to health services, childcare support, and more flexible, family-friendly work schedules among all mothers with young children, especially those less-educated, to reduce growing inequality in children's well-being and family life.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.rssm.2023.100784](https://doi.org/10.1016/j.rssm.2023.100784).

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