Nonstandard Work Schedules and Perceived Instrumental Support among Working Mothers

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Abstract
Previous research examines the consequences of nonstandard work schedules (work outside of the typical 9-5, Monday-Friday schedule) for individuals and their families, but it is unclear whether these consequences extend to other social relationships for working mothers. Nonstandard schedules may weaken a working mother's social ties and limit the availability of social support. Using a sample of working mothers from the Fragile Families and Child Wellbeing Study (FFCWS), we find evidence that mothers who worked nonstandard schedules perceived less instrumental social support compared to mothers who worked standard schedules, even after employing propensity score techniques to address some concerns about selection bias. Furthermore, we find that this negative association is moderated by race; African American mothers who work nonstandard schedules reported significantly less perceived social support compared to White mothers who work nonstandard schedules.

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As the United States has shifted to a 24/7 economy, work outside of the typical 9-5, Monday-Friday schedule is increasingly common, especially among less-advantaged mothers (McMenamin, 2007; Presser, 2003b). Much research examines the consequences of nonstandard work schedules for individuals and their immediate families, but we know very little about how such work experiences influence social relationships outside the family (Cornwell & Warburton, 2014). One exception is Cornwell and Warburton (2014), which linked night and evening shift work with lower levels of community involvement, such as volunteering or connecting with neighbors. Other research shows that weak community ties impact the availability of instrumental support, or the tangible help that others can provide such as emergency child care, shelter, or money (Wellman &Wortley, 1990). Therefore, nonstandard schedules may limit the personal safety net that working mothers can fall back on in times of crisis; however, research to date has not addressed this question.

Several studies highlight the importance of the perceived availability of instrumental support for individuals, particularly those who are less advantaged. Perceived instrumental support is linked to improved mental and physical health (House, Umberson , & Landis, 1988; Thoits, 1995), improved economic outcomes for less advantaged mothers (Harknett, 2006; Henly, Danziger, & Offer, 2005), and improved behaviors among the children of less-advantaged mothers (Ryan, Kalil, & Leininger, 2009). The availability of instrumental support may be particularly significant for working mothers with young children, given the significant stresses associated with early parenthood (Meadows, 2009). As noted by Harknett (2006), mothers working nonstandard schedules may have more need for informal child care support, as they require care during times in which it is not typically available through formal means.

While there exist several dimensions of social support, the current study focuses on perceived rather than received support. Perceived support (also referred to as a personal safety net) is the belief that future support would be available if needed (Meadows, 2009), but does not require that individuals actually receive support. Evidence suggests that perceived support serves as a greater buffer against stress than does received support (Wethington & Kessler, 1986; Thoits, 1995). Furthermore, received support may conflate the availability of social support with the need for such support (Harknett, 2006; Harknett & Hartnett, 2011); individuals who receive support both have a need for that support and a social network that is able to provide the support. In contrast, individuals can benefit from perceiving the availability of support regardless of need.

Despite evidence showing high rates of nonstandard work among lower-SES mothers, as well as research pointing to advantages of perceived social support among this group, no existing study has examined the linkages between maternal nonstandard work and perceived instrumental support. Our study fills this gap. Drawing on a sample of working mothers with young children from the Fragile Families study, we address three specific research questions: (1) is a nonstandard work schedule associated with lower perceived instrumental social support relative to a standard work schedule?; (2) is this relationship moderated by indicators of socioeconomic status, such as the mother's educational attainment or race?; and (3) does the relationship persist even after partially accounting for selection bias using propensity score techniques?

Linking Work Schedules with Social Life

While no other study, to our knowledge, has linked mothers' nonstandard work schedules to social support, we draw on literature relating these schedules to marriage and family life to discuss why they might also influence social ties beyond the immediate family. Several mechanisms may link nonstandard work and perceived instrumental support. These include a

schedule mismatch with other people and institutions that operate during typical daytime hours, health and well-being consequences of nonstandard shift work such as poor sleep and stress related to the job, and being embedded in a social network that has few resources. We describe these mechanisms in more detail below.

First, there exists a schedule mismatch between nonstandard workers and the majority of society, including friends, family, and institutions, that operate during standard daytime hours. The "sociorhythm" of everyday life is organized around a standard daytime schedule, and this puts nonstandard workers out of sync with their social network (Mills & Taht, 2010 pg. 862). For example, night shift workers are at work when most people are sleeping, and sleeping during the day when others are potentially engaged in social or community events. People who work rotating shifts or other unpredictable schedules might find it particularly difficult to make plans with friends or participate in organized activities. Additionally, working mothers with young children may be out of sync with formal child care providers and school schedules, which operate on rigid daytime schedules. Working mothers with nonstandard schedules might not be able to invest in social ties because of this schedule asynchrony that puts them out of touch with friends, family, neighbors, and institutions.

Empirical research provides evidence that schedule asynchrony limits the amount of time nonstandard workers spend with immediate family members, such as spouses and children. For example, Wight, Raley and Bianchi (2008) found that married parents who work nonstandard schedules spend less time with their spouse compared to those who work standard daytime schedules. Although they found that parents who work nonstandard hours spend more time alone with children compared to parents who work nonstandard schedules, they note that parents working nonstandard schedules face challenges taking part in school-related activities, such as

PTA meetings, concerts, and sporting events (Wight, Raley, & Bianchi, 2008). It is possible that this schedule mismatch affects social networks beyond the immediate family as well.

A second mechanism linking nonstandard work and perceived instrumental support is the poorer health and well-being associated with nonstandard work, such as insufficient sleep and work stress, which might make it difficult for workers to invest in social ties. A large body of research suggests that nonstandard work schedules adversely impact workers' sleep (Perrucci, MacDermid et al., 2007; Artazcoz, Cortès, Borrell, Escribà-Agüir, & Cascant, 2007; Ohayon, Lemoine, Arnaud-Briant, & Dreyfus, 2002; Wight, Raley, & Bianchi, 2008). In a study based on the same data used in the current study, Kalil, Dunifon, Crosby and Su (2014) found that mothers working a nonstandard schedule were more likely to get insufficient sleep compared to mothers working standard schedules. Empirical research links insufficient sleep with increased depression, irritability, and interpersonal conflict with family members (Hamilton et al. 2007; Mott et al. 1965). Therefore, the insufficient sleep associated with nonstandard schedules might also prevent working mothers from investing in social ties and sources of instrumental support outside the family.

Relatedly, the concept of work-family spillover may provide some insight into the mechanisms through which nonstandard work could influence social support. Negative work-family spillover occurs when stress or negative experiences at work extend to experiences at home (Staines, 1980). Nonstandard work in the service sector may be particularly stressful because it is often low-paying and provides little job security (McMenamin, 2007; Presser, 2003). Indeed, research has linked nonstandard work schedules with stressful job conditions and negative work-family spillover, and, in turn, marital strain and instability (Grosswald, 2003; Davis, Goodman, Pirretti, & Almeida, 2008; Maume & Sebastian, 2012; DeMaris, 2000). The

stress and negative experiences associated with nonstandard schedules could potentially spill over into other aspects of life beyond the family, such as social interactions.

Finally, as a third linking mechanism, nonstandard work may be associated with limited social support because shift workers are more likely to be embedded in networks with fewer resources. Nonstandard schedules are more common in occupations that are low-wage, low-skilled, and predominately comprised of women and racial minorities (Presser 2003a). Given the tendency for social networks to be homogenous (i.e., the homophily principle), low-income mothers with nonstandard schedules are likely to have social networks that are similarly disadvantaged (McPherson, Smith-Lovin, & Cook, 2001; Swartz 2009). Indeed, empirical research provides evidence that mothers with disadvantages such as low income, poor health, depression, or a large family size, are unlikely to perceive strong social support (Harknett and Hartnett, 2011).

It is also important to note that any linkage between nonstandard work and perceived support may be spurious and based on other factors associated with both nonstandard work and perceived support. To address this possibility, we must carefully account for the nonrandom selection into nonstandard work schedules. In this study we use a propensity score approach that compares nonstandard workers with those who worked a standard schedule but had characteristics that would suggest a high propensity to work a nonstandard schedule.

In addition to the mechanisms hypothesized thus far, we must also consider the possibility that some mothers may choose nonstandard schedules specifically because they dislike interacting with people and want to avoid social obligations. In other words, it's possible that nonstandard work is not a causal mechanism for diminished social support, but that the preferences of workers who select this schedule are also associated with weaker social networks.

Although this explanation is possible, most nonstandard workers report that they don't have very much choice in their job schedule. Presser (2003a) found that nearly half of working mothers with young children under age 14 worked a nonstandard schedule because it was the nature of the job, it was mandated by their employer, or they could not find another job. We cannot fully rule out this alternative explanation, but it is unlikely to strongly bias our results given that about half of mothers who worked nonstandard schedules did not perceive their schedule as a choice or preference.

Variation by socioeconomic status

The linkages between maternal nonstandard work and perceived instrumental support may vary by socioeconomic status—specifically race/ethnicity and education. First, as noted above, the prevalence of nonstandard work is greater among those who are less educated and among Black mothers. Even after taking into account occupational differences, non-Hispanic Blacks are more likely to work nonstandard shifts than non-Hispanic whites or Hispanics (Presser, 2003a). For groups more likely to work nonstandard schedules, the linkages between such work and lower perceived social support might be exacerbated. This would occur if, for example, a person working a nonstandard schedule is embedded in a community of people also working nonstandard shifts. That person could perceive less support if the others around her were also experiencing social disconnection as a result of the nonstandard work. In this situation, one would expect that for Black and less educated mothers, who are more likely to work nonstandard schedules, the linkage between nonstandard work and perceived support would be more strongly negative than for other mothers.

On the other hand, certain groups may have strong social ties, regardless of their work conditions, and these ties may buffer them from the negative associations of nonstandard work.

Some research suggests that African-American single mothers have greater social resources than other groups; for example Hill (1972) highlighted strong kinship ties among African-American families, and Roschelle (1997) observed a tradition of providing instrumental support in the form of caring for other people's children among African-American women. In this case, the negative associations between nonstandard work and perceived instrumental support would be lower for Black mothers.

To summarize, our study is the first to examine the linkages between maternal nonstandard work and perceptions of social support. We also test whether these associations vary by race/ethnicity and education, and employ propensity score methods to address some of the non-random selection of mothers into nonstandard work. In doing so, we expand our knowledge of the ways in which maternal work conditions influence well-being.

Data and Method

This study draws on data from the Fragile Families and Child Wellbeing Study (FFCWS), a longitudinal birth cohort study of 4,898 children born between 1998 and 2000 in 20 large U.S. cities (Reichman, Teitler, Garfinkel, & McLanahan, 2001). When weighted with national sampling weights, the sample is representative of births in the 77 U.S. cities with populations over 200,000. Mothers were initially interviewed in the hospital within two days of their child's birth, and follow-up interviews were completed when the child was one, three, five, and nine years old. Of particular importance to the current study, the FFCWS provides longitudinal measures of employment characteristics such as the timing and regularity of work schedules, as well as longitudinal measures of the mother's perceived instrumental support.

The current study draws on a sample of working mothers with young children, and analyzes data from the baseline survey as well as follow-up interviews conducted when the focal

child was age 3, 5, and 9. We weight the data to be nationally representative of births in large cities, so we excluded respondents who were not in the national sample (n=1456, 30% of initial sample). We also excluded respondents who were not interviewed at any of the three follow-up waves (n=216, 4%), and those who were not employed at any of the three follow-up waves (n=342, 7%). We then pooled observations such that respondents contributed an observation for each of the three follow-up waves in which they were employed. Of the 8,652 potential person-year observations, we excluded n=2,149 because they were not employed (25%), n=1,209 because they were not interviewed at a given wave (n=14%), and n=638 because they were missing data on at least one of the variables included in our analysis (7%). A descriptive comparison of the sample that was dropped due to missing data to the sample that was retained for analysis indicated that mothers in the dropped sample had slightly lower education and household income, but were statistically similar on all other characteristics. The total analytic sample is n=4,656 person-year observations, from n=2,270 unique respondents. 40% of sample respondents contribute an observation for each of the three waves, 33% contribute an observation for two of the three waves, and 27% contribute an observation for one wave.

Although our analytic sample had a small amount of missing data for the variables included in the analysis (0-3%), seventeen percent of our analytic sample of employed mothers was missing data for father's age. Multiple imputation was not a tractable solution to address missing data in our study because we also apply sampling weights and adjust the standard errors for clustering, and these techniques cannot be used in conjunction with multiply imputed data[1]. To address this problem, we used single imputation to predict father's age for respondents with missing data. The imputation model predicted father's age as a function of the mother's age,

[1] There is little research on statistical inference for complex survey data that is multiply imputed (http://www.stata.com/statalist/archive/2014-02/msg00850.html)

mother's education, father's education, the mother and father's relationship, whether the father was ever in jail, household income at wave 1, and the mother's race.

Measures

Maternal Perceived Instrumental Social Support. Our dependent variable is a measure of perceived instrumental support, which was collected at the age three, five and nine core survey follow-up interviews. Mothers were asked whether they could count on someone to: (a) loan them $200; (b) provide them with a place to live; or (c) provide emergency child care if they needed help in the next year. Following Turney, Schnittker, and Wildeman (2012) and Meadows (2009), the variables were coded "1" if the mother reported she could count on someone for the support, and "0" if she could not. Perceived instrumental support is the sum of these items (range 0-3; $\alpha = 0.72$).

Maternal work schedules. The key independent variable in our analysis is the mother's work schedule. Information about work schedules was collected at each follow-up wave with the question: "At your primary job, do you regularly work . . . Weekdays, Evenings (6:00 p.m.–11:00 p.m.), Nights (11:00 p.m.–7:00 a.m.), Weekends, or Different times each week?" Respondents were able to select more than one option. We created a dichotomous variable to indicate whether the respondent worked any nonstandard schedule; respondents were coded "1" if they reported working any of the nonstandard schedules, and "0" if they worked a standard schedule only (the omitted category). The models also account for the number of hours mothers work. Mothers were asked to report the number of hours they usually worked per week, and we recoded this variable into categories indicating 1-19 hours (omitted category), 20-34 hours, and 35+ hours per week.

Control variables.

Mother's and father's characteristics

Mother's race is measured with categories for non-Hispanic white (the omitted category in regression models), non-Hispanic Black, Hispanic, and "other" race, which includes Asian or Pacific Islander and American Indian or Eskimo. Mother's and father's age at the time of the focal child's birth is measured in years; as noted above, the variable for father's age includes imputed values. Mother's and father's education at the focal child's birth is measured with categories for less than a high school degree (the omitted category in regression models), high school degree or General Equivalency Degree (GED), some college or technical school, or a college degree or more. Mother's cognitive ability is measured at the age 3 follow-up using a subset of the Similarities subtest of the Wechsler Adult Intelligence Scale – Revised (WAIS-R). Correct items are summed to create the overall score, with higher scores indicating higher cognitive ability (range: 0-16, alpha .60).

Household characteristics

Dummy variables indicate whether the mother was married to or cohabiting with the biological father of the focal child or another partner at the time of the follow-up interview. These variables were constructed for the public data set using the mother's report of relationship status, but occasionally the father's report was incorporated to fill in missing information or correct discrepancies. The number of children in the household at the time of interview is a continuous measure of children under age 18. Welfare receipt in the year prior to the focal child's birth is indicated with a dummy variable (1=yes, 0=no). Gross household income (before taxes) in the year prior to the focal child's birth is measured in units of ten thousand dollars.

Child's characteristics

Child's sex is measured with a dummy variable, and is coded 1 for male, 0 for female. Parity is measured with a dummy variable that indicates whether the child is the mother's first birth (1=first birth, 0=higher parity). Child's age at assessment is captured with three dummy variables that represent the survey waves, which were conducted when the focal children were approximately age three, five and nine. We chose a categorical specification of child's age because it captures the non-linear distribution of the variable.

Data Analysis

The first stage of analysis relies on Ordinary Least Squares (OLS) regression models to estimate the association between maternal perceived instrumental support and work schedules. This regression is represented in equation (1), where Y_{it} is perceived social support for mother *i* at time *t*, D_{it} is the key independent ("treatment") variable that indicates whether the mother worked a nonstandard schedule at time *t*, δ is the estimated effect of D_{it} on Y_{it}, adjusted for *X*, and *X* is a vector of observed control variables that are thought to determine both D_{it} and Y_{it}. We adjust the standard errors to account for the fact that data are pooled across the age 3, age 5, and age 9 assessments and are therefore not independent. All analyses are weighted with national sampling weights to adjust for the study's complex sampling design and to ensure that the results are nationally representative of births in large cities.

$$Y_{it} = \hat{\alpha} + \hat{\delta} z D_{it} + X\hat{\beta}_{it} + \varepsilon_{it} \qquad (1)$$

Next, we examined whether the linkages between work schedules and perceived instrumental social support vary by the mother's race/ethnicity, or the mother's educational attainment. To examine the possibility that the link between nonstandard work and perceived social support varies by indicators of socioeconomic status, we estimated two separate regression models that interacted the variable for nonstandard work schedule with categories for the

mother's race/ethnicity, and with a dummy variable indicating whether the mother had a "high" level of education (1=some college or more education, 0=high school degree or less education), respectively.

As noted above, women who work nonstandard schedules may be different in many ways from those who work standard schedules, and these selection factors could be associated with perceived social support. To examine whether our results are sensitive to this potential source of bias, we estimated propensity scores, which are conditional probabilities of selection into mid-pregnancy marriage, using logistic regression (Rosenbaum & Rubin, 1983). In equation (2), D_{it} is the treatment variable that indicates whether the mother worked a nonstandard schedule at time *t*. *X* is a vector of covariates that are associated with selection into nonstandard work schedules.

$$\text{Logit}(D_{it}) = \hat{\alpha} + X\hat{\beta} + \varepsilon \qquad (2)$$

We then use the estimated propensity scores, $\hat{p}_i$, from equation (2) to calculate propensity weights represented in equation (3) (Morgan & Todd, 2008, p. 244). Note that the Fragile Families sampling weights, sw_i, are included in the calculation of the propensity score weights, which allows us to account for the complex sampling design and ensure that our results are nationally representative of births in large cities.

$$\begin{aligned} &\text{For } d_i=1\text{: } w_{i,\text{ATT}} = 1 * sw_i \\ &\text{For } d_i=0\text{: } w_{i,\text{ATT}} = \left(\frac{\hat{p}_i}{1-\hat{p}_i}\right) * sw_i \end{aligned} \qquad (3)$$

Next, we estimate a propensity-weighted OLS regression model by applying these weights to equation (1). The propensity weights allow us to estimate the average treatment effect on the treated (ATT), which is the effect of nonstandard work schedules among mothers who have a high propensity to work a nonstandard schedule (Morgan & Todd, 2008). In other words, the ATT estimates focus on the difference in perceived social support between mothers who worked a nonstandard schedule and had a high propensity for working a nonstandard schedule, and mothers who worked a standard schedule but had a high propensity for working a nonstandard schedule.

The propensity weights make the groups of nonstandard and standard shift workers comparable in terms of socio-demographic characteristics, approximating an experimental design where a nonstandard work schedule is randomly assigned. This method assumes that there are no additional confounding differences between mothers who work nonstandard schedules and mothers who work standard schedules, after controlling for observed covariates. We assessed whether the propensity scores balance our data by estimating the average standardized mean and standard deviation differences between treatment and control groups for all covariates in the model (Morgan & Todd, 2008; Rubin, 1973). A value of 0 indicates that the data are perfectly balanced. We experimented with model specification to achieve the best possible balance, adding interaction terms that are justified in light of past theory and research (Morgan & Todd, 2008).

Table A1 presents the results from our final propensity score model. Tables A2 and A3 demonstrate that the propensity weights successfully balanced the data according to two criteria. First, the average standardized mean and standard deviation balance between treatment and control groups was significantly improved when applying the weights (Table A2). Note that any

remaining imbalance is addressed with supplemental parametric adjustment in the propensity weighted regression (Morgan and Todd 2008). Second, there were no statistically significant differences between treatment and control groups when weighted with the propensity weights (Table A3).

Propensity score weighted regression models have several advantages over traditional OLS regression. These models are nonparametric and do not require assumptions about a linear relationship between the dependent and independent variables. They also allow us to restrict inference to the range of common support (i.e., the area of the propensity score distribution for which there are both treatment and control cases), and discard treatment cases that do not have an appropriate comparison. Finally, while OLS models average the effect of nonstandard work across the entire population and assume that the effect is the same for everyone, the ATT focuses on the effect of nonstandard work among mothers who are most likely to work this type of schedule.

The propensity weighted regression approach also provides some advantages over traditional propensity score matching techniques, such as nearest neighbor or stratification matching. It provides a doubly-robust method of balancing the data by incorporating covariates into both the propensity score and the propensity weighted regressions, and therefore provides additional protection against model misspecification (Robins & Rotnitzky, 2001). This method also facilitates a straightforward application of survey weights to account for the study's complex sampling design. Finally, it allows us to take advantage of longitudinal data and account for time-varying characteristics, such as child's age and mother's work hours.

Nonetheless, our methodological approach also has some important limitations. This model can only adjust for differences in observable characteristics. Any unobservable characteristics influencing nonstandard work schedules and perceived social support will bias our estimates. Our results also rely on the correct specification of the propensity score model, which is vulnerable to the limitations of logistic regression. Despite these limitations, we are reassured by the fact that the propensity score model performed quite well in balancing the data.

Results

Table 1 presents descriptive statistics for the total sample and by schedule type. All results are weighted with sampling weights so they are nationally representative of births in large cities. Nearly half of the total mothers in our sample worked a nonstandard schedule, and over two thirds worked 35 hours or more per week. Slightly more than 40% of the total sample is White, a quarter is Black, and about a quarter is Hispanic. About half of mothers were married to the focal child's biological father, and about a quarter were single and not cohabiting. Table 1 also highlights the differences in mothers who worked nonstandard and standard schedules; the asterisks indicate a statistically significant difference between these groups. Mothers who worked nonstandard shifts were less advantaged than those who worked standard shifts, on average. They were less likely to work full-time, had less education, and lower cognitive test scores. They were also more likely to have received welfare in the year prior to the focal child's birth. Such mothers were more likely to be Black (although this is not significant) but no more likely to be Hispanic.

Table 2 presents naïve and multivariate regressions examining the association between work schedules and the mother's perceived instrumental social support. The naïve regression includes only the work schedule and hours as independent variables, and results from this model

indicate that nonstandard schedules are associated with lower perceived instrumental support, controlling for work hours (b=-0.22, 29% of a standard deviation, p<.001). The multivariate regression includes a rich set of control variables that capture maternal, paternal, household, and child characteristics. The coefficient for nonstandard work schedule is slightly attenuated in the multivariate model (b=-0.14, 19% of a standard deviation), but it remains statistically significant at p<.05.

Table 3 presents results from OLS regressions that evaluate whether the relationship between nonstandard work schedules and perceived instrumental support varies by the mother's race, or the mother's education, respectively. Model 1 includes interactions between nonstandard work and the mother's race/ethnicity. In this model, the coefficient for nonstandard work represents the difference in perceived instrumental support between White mothers who worked nonstandard schedules and White mothers who worked standard schedules (b=0.00, not statistically significant). This coefficient suggests that, among White non-Hispanic mothers, there is no difference in social support between standard and nonstandard workers. The coefficient for the interaction term between nonstandard schedule and the dichotomous variable indicating that a mother is Black is negative and statistically significant (b = -0.27, p < 0.05) providing evidence that Black mothers who work nonstandard schedules reported significantly lower perceived social support than White mothers who work nonstandard schedules. The interaction between being Hispanic and working a nonstandard schedule is marginally significant and negative.

Model 2 includes an interaction between high education (some college or more) and nonstandard work. In this model, the coefficient for nonstandard work represents the difference in perceived instrumental support between standard and nonstandard workers, among mothers

with low education (high school or less). Mothers with low education who work a nonstandard schedule reported significantly less social support than mothers with low education who worked a standard schedule (b = -0.23, $p < 0.05$). The coefficient for the interaction term is not statistically significant at traditional thresholds, however, so we have no evidence that the relationship between nonstandard work and perceived support varies by the mother's education. In sum, in Table 3 we find evidence that the relationship between nonstandard work and perceived social support is moderated by the mother's race, but not by the mother's education.

To facilitate the interpretation of results from the interaction model, we plot the predicted mean perceived social support by race in Figure 1. We estimated the predicted means using the estimated coefficients in Table 3 Model 1, for mothers with average characteristics for all of the other variables in our analysis. This figure illustrates not only that there is a significant difference in perceived social support among Black mothers who work nonstandard and standard schedules, but also that there is a significant difference in the perceived social support between Black mothers and White mothers who work nonstandard shifts (denoted with superscript "a").

In the next phase of analysis we used propensity-weighted regressions to estimate the ATT, a conditional average treatment effect that focuses on the effect of nonstandard work among mothers who have a high propensity to work this type of schedule. The results from this regression are presented in Table 4. This model indicates that nonstandard schedules are associated with a slightly lower perceived instrumental support, among mothers who have a high propensity to work a nonstandard schedule (b=-0.12, 16% of a standard deviation, p<.05). Note that the coefficient for nonstandard work is the only interpretable coefficient in this model, because the propensity score has already introduced an adjustment for the other control variables. The estimated effect of nonstandard work schedules is similar in both the propensity-weighted

regressions and OLS regressions, which provides additional support for the estimated negative association between nonstandard work and perceived instrumental support.

Supplemental Analyses

We conducted several supplemental analyses to test the robustness of our results. First we examined whether our results are robust to alternative model specifications. Our dependent variable is not an interval-ratio measurement, so linear regression may not be the most appropriate functional form to describe the relationship between work schedules and perceived support. We estimated ordered logit models, which are designed for ordinal dependent variables, and Poisson models, which are designed for count variables. All models yielded similar results, so we present the results from OLS models for ease of interpretation.

Next, we evaluated whether our results are sensitive to the measurement of nonstandard work schedules. We examined a more detailed measure of nonstandard work schedules that differentiated between night, evening, weekend, and rotating shifts, because prior research found that mothers' night work in particular may lead to particular family challenges (Dunifon et al., 2013). Results from models with the detailed specification of nonstandard work provide evidence that the broad measure capturing any type of nonstandard work is the most significant predictor of perceived instrumental support (results not shown but available on request). We also created a measure of cumulative exposure to nonstandard work to further examine the sensitivity of our results to the measurement of nonstandard work. If nonstandard work is negatively associated with perceived instrumental support at a given point in time, cumulative exposure to this type of schedule should also be associated with declines in instrumental support. Our measure of cumulative exposure is the sum of survey waves in which a nonstandard work schedule was reported, from the age 1, 3, 5, and 9 follow-up surveys (range: 0-4). Results from

this model provide additional support for our main findings; each additional wave of exposure to nonstandard work was associated with a decline in perceived instrumental support (results not shown but available on request).

Finally, we examined whether our propensity-weighted results are sensitive to the selected matching algorithm by comparing our results to those from three traditional matching estimators—nearest neighbor, kernel, and radius matching. Results were similar across all matching algorithms (results not shown but available on request). Although the methodological literature does not provide clear guidance on the selection of a matching algorithm (Morgan & Winship, 2007), we present results from the propensity-weighted regressions because this approach offers several benefits for our study, as noted above.

Discussion

The goal of this study was to examine the linkages between nonstandard work and the perceived instrumental support of a sample of urban mothers. Our study yields three central findings. First, mothers who work a nonstandard schedule perceive lower levels of instrumental support compared to those working a standard schedule (effect size of 19% of a standard deviation). Second, the relationship between nonstandard work and perceived instrumental support holds for African American, but not White or Hispanic, mothers. Finally, the linkages between nonstandard work and reductions in perceived instrumental support are robust even after accounting for some aspects of the nonrandom selection of women into nonstandard schedules.

As mentioned above, several mechanisms may link nonstandard work and perceived support. This study was the first to establish a connection between nonstandard work and perceived support, but did not evaluate which of these pathways may be most important, leaving this as an important avenue for future work.

It is not clear why we found evidence that the linkages between nonstandard work and social support are moderated by race, but not education. However, the fact that that Black women are more likely to work nonstandard jobs (Presser, 2003a) and are also more likely to feel the negative effects of doing so indicates that social network disadvantages, such as a perception of limited or weak instrumental social support, can compound individual-level disadvantages (Harknett, 2006). In this way, nonstandard work schedules may exacerbate racial inequality.

This study has some limitations that should be noted. While our use of the propensity score method provides a robust method of addressing selection factors associated both with nonstandard work and perceived support, such a method cannot address potential bias due to unobservable factors. We are also not able to rule out reverse causality, in which people select into nonstandard jobs on the basis of their social support perceptions or preferences.

In sum, this study is the first to examine linkages between maternal nonstandard work and perceived instrumental support. We find that, for Black women, working a nonstandard schedule is linked to lower levels of perceived support. This provides important information about the potential for nonstandard work conditions to exacerbate existing inequalities.

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Table 1. Weighted Descriptive Characteristics of the Pooled Sample of Employed Mothers, by Schedule

	Total		Nonstandard		Standard		
	Mean/ %	Std. Dev.	Mean/ %	Std. Dev.	Mean/ %	Std. Dev.	
Mother's work schedule							
Nonstandard	0.48		1.00		--		
Standard	0.52		--		1.00		
Mother's work hours at follow-up							
1-19 hours/week	0.10		0.15		0.06		***
20-34 hours/week	0.21		0.24		0.19		†
35+ hours/week	0.69		0.60		0.75		***
Mother's race							
White	0.42		0.38		0.43		
Black	0.24		0.25		0.21		
Hispanic	0.28		0.28		0.29		
Other race	0.07		0.09		0.06		
Mother's age at focal child's birth	27.69	6.00	26.54	5.95	28.69	5.85	***
Mother's education at focal child's birth							
Less than high school	0.17		0.25		0.13		***
High school	0.30		0.30		0.29		
Some college	0.26		0.28		0.23		
College or more	0.26		0.17		0.35		***
Welfare receipt year prior to birth	0.20		0.24		0.15		**
Mother's cognitive test score	7.24	2.68	6.86	2.71	7.45	2.68	**
Father's age at focal child's birth	30.13	6.65	29.05	6.53	31.05	6.60	***
Father's education at focal child's birth							
Less than high school	0.19		0.25		0.15		***
High school	0.30		0.30		0.29		
Some college	0.32		0.30		0.32		
College or more	0.20		0.16		0.24		**
HH income in year prior to birth ($10,000)	4.59	3.62	4.03	3.44	4.94	3.71	***
Child is male	0.58		0.56		0.59		
Child is mother's first birth	0.38		0.38		0.38		
Child's age/survey wave							
Age 3	0.34		0.32		0.33		
Age 5	0.34		0.34		0.31		
Age 9	0.32		0.34		0.36		
Mother's relationship status at follow-up							
Single	0.26		0.26		0.25		
Married to bio father	0.55		0.51		0.58		†
Married to partner (not bio dad)	0.04		0.04		0.05		
Cohabiting with bio father	0.08		0.10		0.07		*
Cohabiting with partner (not bio dad)	0.07		0.09		0.05		*
Number of children in HH at follow-up	2.25	1.12	2.35	1.19	2.18	1.06	*
Perceived instrumental support	2.70	0.75	2.58	0.88	2.79	0.63	**
Unweighted Person-Year Observations	4656		2497		2159		

Asterisks indicate statistically significant difference between standard and nonstandard schedule
**** p<0.001, ** p<0.01, * p<0.05, † p<0.10*

Table 2. OLS regressions predicting mother's perceived instrumental support

	Naïve	Multivariate
	B (SE)	*B (SE)*
Nonstandard schedule	-0.22***	-0.14*
	(0.07)	(0.05)
20-34 hours/week	-0.13	-0.05
	(0.11)	(0.09)
35+ hours/week	-0.10	0.02
	(0.10)	(0.09)
Black		-0.07
		(0.07)
Hispanic		-0.14
		(0.07)
Other race		-0.09
		(0.08)
Mother's age at focal child's birth		0.01
		(0.02)
Mother's education: High school		0.24
		(0.12)
Mother's education: Some college		0.24
		(0.12)
Mother's education: College or more		0.19
		(0.13)
Welfare receipt year prior to birth		-0.04
		(0.10)
Mother's cognitive test score		0.02
		(0.01)
Father's age at focal child's birth		-0.03*
		(0.01)
Father's education: High school		0.21
		(0.11)
Father's education: Some college		0.15
		(0.11)
Father's education: College or more		0.14
		(0.12)
HH income		0.04***
		(0.01)
Child is male		-0.12
		(0.06)
Child is mother's first birth		0.03
		(0.07)
Age 5		0.06
		(0.04)
Age 9		0.01
		(0.04)
Married to bio father		0.28***
		(0.08)
Married to partner (not bio dad)		0.32***
		(0.07)
Cohabiting with bio father		0.08
		(0.11)

Cohabiting with partner (not bio dad)		0.08
		(0.10)
Number of children in HH		-0.03
		(0.04)
Constant	2.90***	2.75***
	(0.09)	(0.31)
Person-Year Observations	4,656	4,656
Unique Observations	2270	2270
R^2	0.02	0.22

Robust standard errors in parentheses
**** p<0.001, ** p<0.01, * p<0.05*

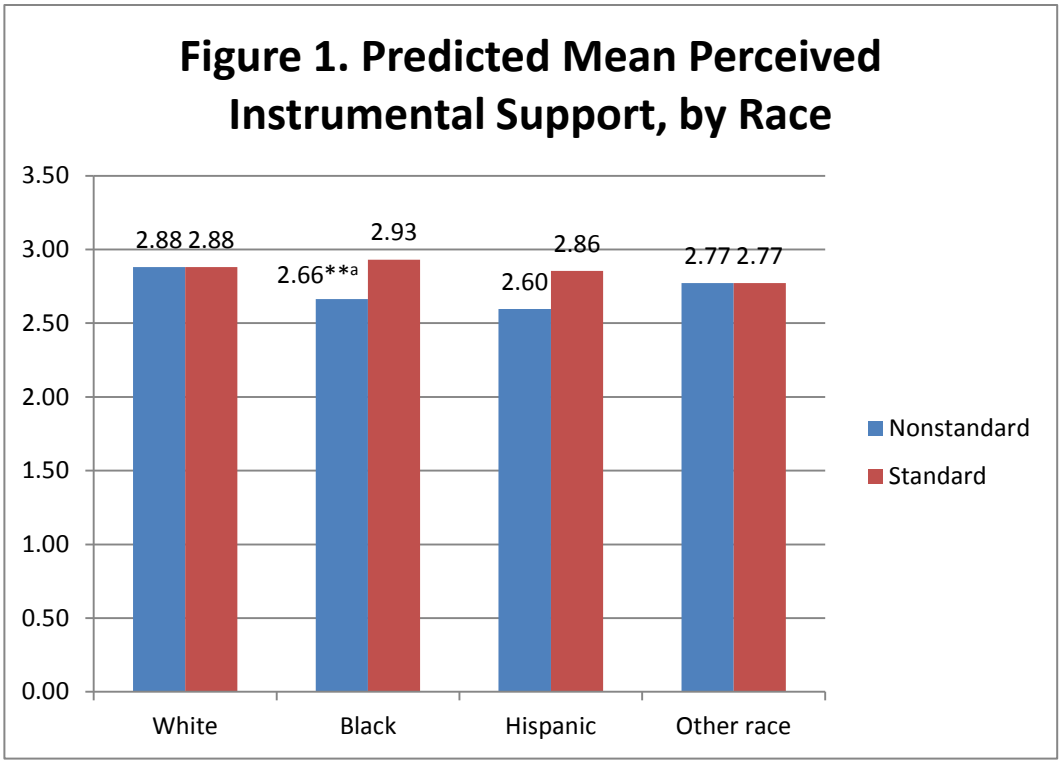
Table 3. OLS regressions predicting mother's perceived instrumental support, with interactions (weighted with sampling weights)

	Model 1	Model 2
	Race Interactions	Education Interactions
	B (SE)	*B (SE)*
Nonstandard schedule	0.00	-0.23*
	(0.05)	(0.09)
Black	0.05	-0.05
	(0.08)	(0.08)
Hispanic	-0.02	-0.15*
	(0.08)	(0.07)
Other race	-0.11	-0.10
	(0.08)	(0.08)
Nonstandard*Black	-0.27*	
	(0.11)	
Nonstandard*Hispanic	-0.26†	
	(0.15)	
Nonstandard*Other race	-0.00	
	(0.15)	
High education		-0.05
		(0.07)
Nonstandard*High education		0.19†
		(0.10)
Constant	2.68***	2.84***
	(0.30)	(0.30)
Person-Year Observations	4,656	4,656
Unique Observations	2270	2270
R^2	0.23	0.22

Note: Table is truncated; in addition to variables shown, all models control for mother's and father's education, mother's work hours, mother's and father's age at focal child's birth, welfare receipt, mother's cognitive test scores, household income, focal child's age, focal child's sex, whether the focal child is the mother's first birth, relationship status at the time of interview, and the number of children in the household.

Robust standard errors in parentheses

**** p<0.001, ** p<0.01, * p<0.05, † p<0.10*



Asterisk indicates statistically significant difference between standard and nonstandard

**** p<0.001, ** p<0.01, * p<0.05*

[a] indicates statistically significant difference compared to Whites ($p < 0.05$).

Table 4. ATT-weighted propensity score models predicting perceived instrumental support among working mothers

	B (SE)
Nonstandard schedule	-0.12*
	(0.05)
Constant	2.84***
	(0.30)
Person-Year Observations	4,646
Unique Observations	2266
R^2	0.23

Note: Table is truncated; in addition to variables shown, the model controls for mother's work hours, mother's race/ethnicity, mother's and father's education, mother's and father's age at focal child's birth, welfare receipt, mother's cognitive test scores, household income, focal child's age, focal child's sex, focal child is first birth, relationship status at the time of interview, and the number of children in the household.

Robust standard errors in parentheses

**** p<0.001, ** p<0.01, * p<0.05*

Table A1. Propensity score model predicting nonstandard work

	B (SE)
20-34 hours/week	-1.13**
	(0.39)
35+ hours/week	-1.45***
	(0.37)
Black	-0.45
	(0.32)
Hispanic	-0.44
	(0.39)
Other race	0.40
	(0.77)
Mother's age at focal child's birth	-0.03
	(0.03)
Mother's education: High school	-0.36
	(0.28)
Mother's education: Some college	-0.14
	(0.35)
Mother's education: College or more	-1.08*
	(0.42)
Welfare receipt year prior to birth	-1.46*
	(0.58)
Mother's cognitive test score	-0.02
	(0.04)
Father's age at focal child's birth	-0.03
	(0.03)
Father's education: High school	-0.40
	(0.25)
Father's education: Some college	-0.50
	(0.33)
Father's education: College or more	-0.75*
	(0.38)
HH income	0.00
	(0.03)
Child is male	-0.02
	(0.18)
Child is mother's first birth	-0.06
	(0.39)
Married to bio father	-0.16
	(1.01)
Married to partner (not bio dad)	-2.43
	(1.55)
Cohabiting with bio father	-0.58
	(1.24)
Cohabiting with partner (not bio dad)	-1.83
	(1.05)
Number of children in HH	-0.14
	(0.32)
Age 5	0.08
	(0.16)
Age 9	-0.06

	(0.19)
welfXxmhrs34	1.84**
	(0.66)
welfXxmhrs35	1.72**
	(0.62)
cmmarfXcm1age	0.01
	(0.03)
cmmarpXcm1age	0.05
	(0.06)
cmcohfXcm1age	0.02
	(0.04)
cmcohpXcm1age	0.04
	(0.04)
cmkidsXfirstbirth	0.10
	(0.17)
cmmarfXblack	0.19
	(0.49)
cmmarpXblack	1.08
	(0.67)
cmcohfXblack	0.65
	(0.83)
cmcohpXblack	1.54**
	(0.53)
cmmarfXhispanic	-0.24
	(0.54)
cmmarpXhispanic	1.66*
	(0.80)
cmcohfXhispanic	-0.08
	(0.88)
cmcohpXhispanic	1.58*
	(0.69)
cmmarfXothrace	0.57
	(0.89)
cmcohfXothrace	-1.54
	(1.43)
cmcohpXothrace	-1.07
	(1.24)
cmkidsXcf1age_imp	0.01
	(0.01)
Constant	3.77***
	(1.10)
Observations	4,653

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Table A2. Average of standardized mean and standard deviation differences between nonstandard and standard schedule

	Mean	Std. Dev.
Sampling weight	0.15	0.05
ATT weight	0.02	0.02

Table A3. ATT- weighted descriptive statistics

	Nonstandard Schedule		Standard Schedule	
Variable	Mean/%	Std. Dev.	Mean/%	Std. Dev.
Mother's work hours at follow-up				
1-19 hours/week	0.15		0.15	
20-34 hours/week	0.24		0.24	
35+ hours/week	0.61		0.61	
Mother's race				
White	0.39		0.40	
Black	0.26		0.26	
Hispanic	0.27		0.27	
Other race	0.08		0.07	
Mother's age at focal child's birth	26.50	5.96	26.48	5.70
Mother's education at focal child's birth				
Less than high school	0.24		0.23	
High school	0.31		0.32	
Some college	0.28		0.29	
College or more	0.17		0.17	
Welfare receipt year prior to birth	0.24		0.24	
Mother's cognitive test score	6.95	2.69	7.07	2.69
Father's age at focal child's birth	29.02	6.56	28.87	6.44
Father's education at focal child's birth				
Less than high school	0.24		0.25	
High school	0.30		0.30	
Some college	0.31		0.30	
College or more	0.15		0.15	
HH income in year prior to birth (in $10,000)	4.08	3.43	4.17	3.38
Child is male	0.56		0.56	
Child is mother's first birth	0.38		0.39	
Child's age/survey wave				
Age 3	0.33		0.35	
Age 5	0.35		0.33	
Age 9	0.31		0.32	
Mother's relationship status at follow-up				
Single	0.27		0.27	
Married to bio father	0.51		0.51	
Married to partner (not bio dad)	0.04		0.03	
Cohabiting with bio father	0.10		0.10	
Cohabiting with partner (not bio dad)	0.09		0.10	
Number of children in HH at follow-up	2.35	1.20	2.42	1.24
Observations	2497		2159	

Note: no statistically significant differences between standard and nonstandard schedule when weighted with the ATT weights, $p<0.05$