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Nonstandard Maternal Work Schedules: Implications for African American Children's Early Language Outcomes

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Abstract

In this study, observed maternal positive engagement and perception of work-family spillover were examined as mediators of the association between maternal nonstandard work schedules and children's expressive language outcomes in 231 African American families living in rural households. Mothers reported their work schedules when their child was 24 months of age and children's expressive language development was assessed during a picture book task at 24 months and with a standardized assessment at 36 months. After controlling for family demographics, child, and maternal characteristics, maternal employment in nonstandard schedules at the 24 month timepoint was associated with lower expressive language ability among African American children concurrently and at 36 months of age. Importantly, the negative association between nonstandard schedules and children's expressive language ability at 24 months of age was mediated by maternal positive engagement and negative work-family spillover, while at 36 months of age, the association was mediated only by negative work-family spillover. These findings suggest complex links between mothers' work environments and African American children's developmental outcomes.

Keywords

maternal nonstandard work; African American families; parenting; work-family spillover; early child language

Since the late 1990s, García-Coll and colleagues (1996) have called upon researchers to emphasize the importance of accounting for more distal social contexts among families of color, to gain a more comprehensive picture of the ecologies of young children's development. However, few studies have explored how the timing of work schedules may impact family interactions and child outcomes in the African American community. Given the prominence of psychologically draining employment conditions, like nonstandard schedules, among low-income African American parents (McLoyd & Enchautegui-de-Jesus,

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2005; Presser, 2003a; Presser & Cox, 1997), it is important to gain a better understanding of how work-related factors may shape the parenting environment and alter outcomes for their children.

Jobs that operate outside of the traditional 9-to-5 workday are often referred to as nonstandard work schedules or nonstandard shifts (Presser, 2003b; Presser & Cox, 1997). Previous studies have highlighted significant negative associations between parents' nonstandard work schedules and children's cognitive and language outcomes; however the specific mechanisms by which nonstandard shifts exert their influence on children's outcomes have been less systematically explored (for exceptions see, Han, 2008; Hsueh & Yoshikawa, 2007; Joshi & Bogen, 2007; Phillips, 2002). Bronfenbrenner's ecological theory (Bronfenbrenner, 1986; Bronfenbrenner & Morris, 1998) suggests that children's developmental outcomes are shaped both by distal and proximal environmental factors. Nonstandard work schedules may be conceptualized as a distal environmental factor that impacts parental well-being and shapes children's development. More specifically, although nonstandard work schedules leave more time during the day for mothers to interact with their young children, women who work late hours may be physically and emotionally exhausted during daytime hours and less able to fully engage in high-quality interactions (i.e., sensitive, stimulating, and responsive) with their young children, thereby creating negative implications for children's developmental outcomes. The first three years of life have been described as a period of rapid language growth and mother-child interactions play an integral role in this learning process (Rodriguez et al., 2009). Thus, the association between parenting-related factors and child language development represents an important area of inquiry within the context of nonstandard work schedules. In the review that follows, we briefly describe employment patterns among African American women with young children, particularly those living in rural, low-wealth environments. We then more specifically focus on nonstandard schedules and their association with children's early expressive language development. Finally, consistent with our ecological systems framework, we identify maternal positive engagement and negative work-family spillover as potential mediators of the association between nonstandard work schedules and African American children's early expressive language outcomes.

African American Women and Employment

Ethnographic studies have consistently identified a strong work orientation among African Americans, particularly in the rural South (Hill, 1971; Thornton Dill, 1998). Historically, rates of employment among African American women with children under the age of 3 have surpassed the work rates of European American women with young children (Cohany & Sok, 2007) often due to greater economic need among African American families (Hill, 1971; McLoyd & Enchautegui-de-Jesus, 2005). However, the literature on mothers' employment and its implications for family processes and child outcomes has focused almost exclusively on European American families. Given that African American mothers are likely to work even when young children are in the home, pertinent questions remain about the association between characteristics of employment conditions, parenting, and African American children's developmental outcomes.

African American mothers are disproportionately represented in jobs with nonstandard work schedules (Presser, 2003b; Presser & Cox, 1997). In 2004, 14.2% of African Americans worked night and evening shifts, as compared with 9.1% of European Americans (McMenamin, 2007). Moreover, African American mothers are more likely than European American mothers to work nonstandard hours because on average, they have lower levels of education and lack alternative employment opportunities (McLoyd & Enchautegui-de-Jesus, 2005). In rural communities where jobs are scarce and rates of poverty are high, particularly

among African American women with young children (O'Hare, 2009), African American mothers may accept jobs that are low quality, labor intensive, and pay low wages out of necessity (Brody & Flor, 1997). Moreover, because rural families have access to fewer resources such as public transportation and child care (due to social isolation), employment in jobs with nonstandard schedules may place rural African American mothers at increased risk for psychological distress that can compromise processes occurring within the family context (Brody, Neubaum, Boyd, & Dufour, 1997; Bushy, 1998; Odom, Vernon-Feagans, & the Family Life Project Key Investigators, 2010). The current study seeks to highlight the life experiences of a sample of African American mothers and their children who participated in a larger study on families living in areas of high rural poverty by exploring the link between nonstandard work schedules, factors associated with parenting, and children's expressive language development.

Nonstandard Work Schedules and Children's Language Outcomes

Researchers have only recently begun to explore how children's learning and language outcomes are associated with parents' hours of employment. Most studies have consistently identified negative associations between maternal employment during nonstandard work hours and children's cognitive-related outcomes among more middle-income samples. Heymann (2000) found that having parents who worked evenings and nights put school-age children at risk of academic failure. Children whose parents worked evening shifts scored lowest on tests of mathematics achievement. Similarly, Hsueh and Yoshikawa (2007) found that parental employment in nonstandard schedules was associated with lower teacher-rated school performance among low-income families with children ages 5–12. Han (2005) explored nonstandard work hours using the NICHD Study of Early Child Care, a relatively advantaged sample of employed mothers (i.e., it excluded children of teen mothers, mothers with identified substance abuse problems, mothers not fluent in English, and children from dangerous neighborhoods). Children whose mothers worked nonstandard hours in their first year of life had poor cognitive development (i.e., sensory perception, memory, learning, problem solving, early verbal communication) and expressive language at three years of age. Some studies of low-income families have not found any direct associations between parents' nonstandard work schedules and children's cognitive outcomes. For instance, Han (2006) and Phillips (2002) found no association between maternal nonstandard shift schedule and school engagement among children six years of age and older in low-income families.

Most of the studies cited here that have examined nonstandard work hours and child development have typically controlled for race rather than focusing on particular issues that might be related to being African American and being employed during nonstandard work hours. Yet, African American children have been consistently identified as being at increased risk for less optimal development in the domain of language because of environments with less parental language input, especially when they are from low-income households (Craig, Conner, & Washington, 2003; Hart & Risley, 1995; Hoff, 2006). Though negative associations between poverty and early language acquisition have proven to be quite stable in terms of later language and school achievement (Raviv, Kessenich, & Morrison, 2004), there is little research on African American families living in poverty to explore whether nonstandard work hours might be related to early language and whether parenting plays a role in this relationship. Thus, clarification of potential mechanisms that may mediate the association between mothers' shift schedule and low-income, African American children's early language skills is warranted.

Parenting Environment as a Mediator of Nonstandard Schedules and Children's Language

The consequences of nonstandard work schedules may have their most direct implications for mothers' ability to provide a sensitive and responsive parenting environment. Literature suggests that most adults who work nonstandard work hours suffer from sleep disturbances which contribute to physical exhaustion and emotional difficulties (Pilcher, Lambert, & Huffcutt, 2000; Staines & Pleck, 1984). Thus, working outside of typical daytime hours is likely to increase fatigue, in turn, placing strains on family relationships and increasing negative mood. Moreover, individuals who work nights and evenings may experience stress in balancing the demands of nighttime employment and family obligations during they day, when they should be sleeping (Gassman-Pines, 2011; McLoyd, Toyokawa, & Kaplan, 2008).

When considering mechanisms through which mothers' job conditions impact children's outcomes, a role stress perspective on work-family relationships suggests that stressful work characteristics (i.e., nonstandard shift work) may spill over into the family domain, negatively impacting workers' ability to attend to their personal and family needs (Bolger, DeLongis, Kessler, & Wethington, 1989). Thus, the strains a woman experiences in the role of employee in nonstandard work schedules may make the demands of fulfilling her role as a mother more challenging – especially when engaging a young child. Recent empirical findings indicate that stressful work conditions, like nonstandard shift schedules, are positively associated with depression and negative work-family spillover (Davis, Benjamin Goodman, Pirretti, & Almeida, 2008; Gassman-Pines, 2011; Perry-Jenkins, Goldberg, Pierce, & Sayer, 2007; Staines & Pleck, 1984). Also, nonstandard shift schedules have been linked to overall low-quality home environments, including more harsh-withdrawn parenting, less maternal warmth/sensitivity, less frequent participation in family activities, and fewer cognitively-stimulating activities (Gassman-Pines, 2011; Lleras, 2008; Strazdins, Clements, Korda, Broom, & D'Souza, 2006). Most notably, research suggests that working nonstandard shifts is most detrimental to the home environments and developmental outcomes of children living in poor households because low-income parents have fewer economic and social resources to manage stress associated with work and family (Gassman-Pines, 2011; Han, 2008; Heymann & Earle, 2001).

The adverse effects of nonstandard work schedules on parents' well-being have begun to raise concerns about the indirect effects of nonstandard schedules on children's outcomes through parenting-related factors. Numerous studies have linked mothers' nonstandard shift work to behavioral difficulties among children and have evidenced partial mediation through psychological distress and parenting variables (Daniel, Grzywacz, Leerkes, Tucker, & Han, 2009; Joshi & Bogen, 2007; Rosenbaum & Morett, 2009; Strazdins et al., 2006). However, only one investigation has examined possible mediators of the association between mothers' employment in nonstandard shift schedules and young children's achievement-related outcomes. Han (2005) found that the association between maternal employment in nonstandard shifts and children's cognitive/language development was attenuated after controlling for maternal sensitivity, depression, home environment, and child care quality.

Summary

The present study explored a mediational model of the association between maternal work schedules, factors associated with the parenting environment and children's early expressive language at 24 and 36 months of age within a sample of rural, mostly low-income African American families. Specifically, it was expected that maternal positive engagement and negative work-family spillover at 24 months, would mediate the association between

mothers' nonstandard work schedule and children's expressive language outcomes at 24 and 36 months of age.

Method

Participants

These data come from the Family Life Project (FLP). The FLP is a representative sample of babies born to mothers who resided in one of six low-wealth rural counties in North Carolina and Pennsylvania over a one-year period, oversampling for African Americans in North Carolina and for poverty in both states. FLP is an ongoing, longitudinal study examining the implications of rurality, economic resources, and family relationships for young children's development. For one year, project recruiters visited all mothers in the hospital who had given birth the day before. Families that did not speak English as a primary language, lived outside the six study counties, were planning to move within three years, or did not have custody of the target child were ineligible for participation. Mothers who delivered their babies in surrounding counties were located through birth records. The overall coverage rate was over 90%, and the acceptance rate for those families who were eligible and selected to participate was 82%. The overall sample included 1,292 families, who have been visited in their homes eight times over the children's first three years of life (a more detailed description of the recruitment process and sample can be found in Vernon-Feagans et al., 2008).

A total of 526 African American families (41% of the full sample) participated at the first data collection point when the target child was two months of age. By the 24-month time point, 444 African American families consented to participate. Of these families, 260 primary caregivers were employed. Cases were deleted if the family included a primary caregiver that was male ($n=2$) or if work schedule or hours information was missing ($n=8$). At 24-months, 19 children had missing outcome data while at 36-months, 13 children had missing outcome scores. The final regression analyses were based on families with employed mothers at 24 months and those with complete child outcome data at each timepoint. At 24 and 36 months, 231 families with employed, female caregivers (almost always mothers) at the 24-month assessment were represented. Of the participant families, 1 female caregiver was the maternal grandmother of the target child and another female caregiver was a cousin. The remaining female caregivers were biological mothers. For ease of discussion, primary caregivers will be referred to herein as mothers.

Procedure

The current data were collected during two and a half hour home visits that were conducted when the target child was 24 months of age and 36 months of age. Two home visitors simultaneously collected a variety of data from the families, including interviews, questionnaires, and DVD-recorded parent-child interactions. All interviews and questionnaires in the FLP were collected via laptop computers for confidentiality, efficiency, and accuracy. At each assessment, new primary caregivers completed the KFAST literacy screener (Kaufman & Kaufman, 1994). Mothers reading at an eighth grade reading level (or beyond) were given the opportunity to complete questionnaires on their own, whereas those who read below an eighth grade reading level had questionnaires read to them. Parent/child interactions were collected during two separate 10-minute DVD recorded sessions at 24 months of age.

Primary caregiver behaviors during play interactions with their children at 24 months—Mothers and their children were seated at a table and were asked to complete a set of three puzzles of increasing difficulty. In this task, mothers were instructed to provide

assistance to their child as they felt necessary. The play session lasted 10 minutes and was recorded using a DVD camcorder for later coding. The second session was used to gather child language. A wordless picture book session between the mother and child was recorded in the home using a DVD camera and wireless microphones that the child wore in a vest. Mothers were asked to sit in a comfortable chair or couch with the child. Mothers were told: “This is a wordless picture book activity for you and [infant’s name]. Please ‘go through’ the book with your child as you normally would. When you and [infant’s name] are through, just let me know.” The picture book activity commenced when the parent was given the book and the instructions for the task had ended. The activity ended when the mother signaled to the coder that the activity was completed. The home visitors were told to end the session after 10 minutes if the mother had not signaled she had finished before that point.

Measures

Individual and demographic characteristics

Background information: At the 24-month home interview, information was gathered on maternal education, target child’s age, whether the child was in formal child care (0=no, 1=yes), and state (1=NC, 0=PA). Mothers reported the highest level of education obtained to date on a scale ranging from less than high school to Ph.D. Additionally, in this sample the overwhelming majority of African American families resided in NC, thus location of residence was included to address a potential confound.

Income/needs ratio: The FLP adopted the approach taken by Hanson, McLanahan, and Thomson (1997) of basing household income on anyone who resides in the household, not simply those people related by blood, marriage, or adoption. People were considered to be co-residents if they spent three or more nights per week in the child’s household. The total annual household income for the family was divided by the federal poverty threshold for a family of that size and composition to create the income/needs ratio, which was calculated using the 2006 poverty threshold values, with a ratio of 1 being the poverty level (see Vernon-Feagans et al., 2008 for more detailed description).

Maternal work schedule characteristics—At each home visit, the mother completed a jobs grid. The Jobs Grid Questionnaire was developed specifically for the Family Life Project and was administered via computer using Blaise software. The questionnaire explores various aspects of participants’ employment situation, including the number of jobs the participant works and the activities involved in their jobs.

Job hours: Total job hours is the hours per week a parent worked on all jobs held. If the parent was employed at more than one job, these hours were included in total job hours. In this sample, total hours worked across all jobs was highly correlated with hours employed in one’s primary job ($r=.92, p<.001$).

Nonstandard work schedule: Although some research studies have differentiated among night, evening, and rotating shifts, distinctions in this sample were not possible due to cell size limitations (155- fixed day shift, 43- fixed evening shift, 17- fixed night shift, 15- rotating shift, 21- irregular shift). Studies suggest, however, that a dichotomous measure of work schedules may actually more accurately reflect the often erratic or inconsistent nature of low-income parents’ work routines (Henly & Lambert, 2005; Joshi & Bogen, 2007). Nonstandard work schedule is a dichotomous variable in which 1 = nonstandard work shifts (including fixed evening shift, fixed night shift, rotating shift, or irregular) and 0 = fixed day shift (most work hours between 8am and 5pm). Information on nonstandard work schedules was collected for the primary job only.

Mediating factors

Maternal positive engagement: Mother-child puzzle tasks were coded by independent coders who were unaware of the study's hypotheses. Coders were trained using selected video recorded puzzle interactions that had been previously coded by criterion coders. Approximately 30% of the parent codes were double-coded, that is, the final scores were reached by consensus between 2 coders. Reliability was determined by calculating the intraclass correlation coefficients for ratings made by pairs of trained coders. Each coding pair maintained reliability estimates at above $r = .80$ for the subscales.

Seven subscales were used to evaluate maternal behavior during the puzzle task. The following qualitative ratings have been used in previous studies to assess the quality of parent-child interaction during the 10-minute free-play sessions (Cox, Paley, Burchinal, & Payne, 1999; NICHD Study of Early Child Care, 1999) and include: sensitivity/responsiveness, detachment/disengagement, positive regard, intrusiveness, animation, stimulation of development, and negative regard. Coders rated each of these areas on a 5-point Likert scale (from 1 = Not at all characteristic, to 5 = Highly characteristic). Factor analyses guided overall composites and maternal positive engagement was created by summing the scale scores for positive regard (level of positive feelings expressed to the child), stimulation of development (appropriate level of scaffolding activities with the child), animation (level of energy or excitement), and detachment (reverse-scored; level of emotional disengagement).

Negative work-family spillover: Mothers completed the four-item Negative Work-Family Spillover Scale (Grzywacz & Marks, 2000), measuring the degree to which the demands of the workplace reduce a person's ability to adequately tend to personal or family needs at home (e.g., "Your job reduces the effort you can give to activities at home"). Responses were rated on a five-point scale ranging from *all the time* to *never* with higher scores reflecting greater negative work-family spillover. A sum score was created ($M = 9.64$, $SD = 3.72$, $\alpha = .83$). Grzywacz, Almeida, and McDonald (2002) found that self-reported negative work-family spillover was associated with work-family stress one year later, providing evidence of criterion validity.

Child expressive language outcomes

Number of different words: Child expressive language at 24 months was derived from the picture book session in the home. The software, Systematic Analysis of Language Transcripts (SALT; Miller & Chapman, 1991), was used to transcribe all of the DVDs of the picture book activities. Highly trained research assistants transcribed the language directed to the child during the session. Transcribers underwent an extensive training process conducted by a senior graduate student and staff. SALT conventions and definitions were developed through weekly group meetings that resulted in a detailed training manual. The training process for transcribers included transcribing 20 transcripts that were then reviewed by a senior graduate student, who watched the DVDs while following the transcript to assure accuracy in transcription conventions. As an ongoing check, this review process continued regularly with all transcribers periodically transcribing the same DVDs and discussing them at weekly research group meetings to ensure consistency in transcription.

The Number of Different Words (NDW) was determined on the basis of unique free morphemes. Omitted and unintelligible words were not included. Variations in the words were not counted as separate root words. For instance, *talk* and *talked* would be considered the same root word. This variable is a measure of the number of different words used by children during the videotaped interaction with their parents, and indicates the overall lexical diversity during the picture book activity. The mean NDW was 18.96 ($SD = 17.57$).

Preschool Language Scale: Child expressive language at 36 months was measured by the expressive subtest of the Preschool Language Scale (PLS). The Preschool Language Scale Fourth Edition (PLS-4; Zimmerman, Steiner, & Pond, 2002). This test was administered by home visitors in the child's home at 36 months. The PLS-4 is a norm-based measure of children's language skills, from birth to age six. The PLS-4 yields two subscale measures: auditory comprehension and expressive communication. Only the expressive communication subscale of this test was administered in this project. Test-retest reliability for this age group has been found to be .82 for expressive communication, and internal consistency estimates have been found to be .91 for expressive communication (Zimmerman, et al., 2002). The reliability and validity of a previous version of the PLS (PLS-3) was estimated for use with a low-income African American sample (Qi, Kaiser, & Milan 2003). The authors found that the PLS-3 expressive language scores of children in the low-income population consistently scored lower than the middle-SES normative sample. Moreover, the validity of the PLS as a measure of language delay in African American children from low-income households was determined to be appropriate when compared to three other commonly used measures of child language. In the current sample, the average PLS score was 96.02 ($SD = 13.47$). Over half (67%) of the children scored below the normative mean ($M = 100$, $SD = 15$).

Plan of Analysis

To investigate our hypotheses, we conducted hierarchical regression analyses, controlling for family income-to-need, state, child age, whether or not the child was in child care, maternal education, number of hours employed, and depression. In both models, dummy variables were coded for cases with missing values for predictor variables. This approach allowed for all participants with outcome variables to be included in the analyses (see NICHD ECCRN & Duncan, 2003, for details). The dummy variable had a value of one if the predictor was missing and zero otherwise. By assigning the mean value of the predictor to the individuals with missing data, coefficients were then estimated for each predictor using the data from individuals without missing data (this is analogous to full information maximum likelihood in structural equation modeling).

First, we tested the direct effect of maternal nonstandard schedule on children's expressive language ability, holding the covariates constant. Second, when a significant relationship was detected in the baseline models between nonstandard schedules and children's language outcomes, we added maternal positive engagement and negative work-family spillover to the baseline model to test for mediating effects. In order to formally test whether the parenting environment, including positive engagement and negative work-family spillover, mediated the relationship between African American mothers' employment in nonstandard schedules and children's expressive language outcomes, we tested whether the product of coefficients from (1) employment in a nonstandard schedule to parenting environment and (2) from parenting environment to child expressive language was different than 0 (i.e., bootstrapping with multiple mediation). Parenting environment mediation is evidenced to the extent that the product of coefficients is significantly different than 0. Because the focus was on tests of both the combined effects (i.e., positive engagement and negative work-family spillover effects considered jointly) and unique effects (i.e., positive engagement and negative work-family spillover effects considered individually) of parenting environment, we adopted the framework developed by Preacher and Hayes (2008), which is implemented in their freely distributed SAS Macro.

Results

Descriptive

Tables 1 and 2 present the descriptive statistics and correlations for the variables included in the regression models and shows how maternal work, demographic characteristics, children's characteristics, and parenting factors differ as a function of standard and nonstandard shift schedules. Over one-third (38%) of the mothers worked nonstandard schedules when their child was 24 months old. Though all of the mothers in this sample were employed, on average they lived just above 150% poverty. While a family with income exactly at the poverty line has an income-to-needs ratio of 1 or 100% of the poverty level, the mean income-to-needs ratio for the current sample was 1.56, which indicates a near-poverty status. Mothers had an average of 12 years of education and resided primarily in North Carolina. The average age of the focal child was 25.44 months, and 52% were male. Most children were in some form of out-of-home care at 24 months (91%).

A significant negative correlation existed between nonstandard schedule and child NDW at 24 months ($r = -.18, p < .01$) and PLS scores at 36 months ($r = -.17, p < .01$). A series of t-tests was conducted to determine if means on the outcome and independent variables were significantly different for mothers who worked standard versus nonstandard work hours. Children of mothers who worked nonstandard hours had lower mean expressive language scores than children with mothers who worked standard day hours at both time points ($t = 2.93, p < .01$ at 24 months, $t = 2.85, p < .01$ at 36 months). Also, child expressive language scores at both timepoints were positively correlated with maternal positive engagement (NDW at 24 months $r = .23, p < .001$; PLS at 36 months $r = .29, p < .001$). While child NDWs at 24 months was not significantly correlated with negative work-family spillover ($r = -.03, p = .61$), a significant correlation between child PLS scores at 36 months and negative work-family spillover ($r = -.16, p < .05$) was observed. Household income-to-needs ratio ($t = 2.66, p < .01$) and education ($t = 2.80, p < .01$) was higher among mothers who worked standard day hours than those who worked nonstandard hours. Similarly positive engagement ($t = 4.43, p < .001$) was higher among standard day workers; however, negative work family spillover was higher among mothers who worked nonstandard hours ($t = -3.12, p < .01$).

Children's Expressive Language Outcomes: Baseline and Mediator Models

The results for the regression analyses are shown in Table 3. First the concurrent association between mothers' work schedule and children's expressive language ability was explored. For number of different words, the first model showed that among employed African American mothers, working nonstandard hours was negatively associated with children's expressive language ability at 24-months ($\beta = -.16, p < .05$). That is, in comparison to working standard day hours, mothers with nonstandard work schedules had children with lower expressive language skills. Also, older child age was associated with greater expressive language ($\beta = .14, p < .05$).

To assess whether the effect of nonstandard work schedules on expressive language at 24 months operated indirectly through its effect on the parenting environment, we added positive engagement and negative work-family spillover in Model 2 and conducted formal tests of mediation. With the inclusion of positive engagement ($\beta = .19, p < .01$) and negative work-family spillover ($\beta = -.01, p = .88$) the effect of nonstandard shift schedule was no longer significant, consistent with the notion of mediation ($\Delta F = 3.79, p < .05$). The final model, including all predictors (covariates, the work schedule variable, the parenting factors) accounted for 8% of the variance in children's expressive language at 24 months, $F = 3.07, p < .01$. Formal tests of mediation showed that positive engagement alone mediated

the association ($z = -1.21$, 95% CI $[-2.87, -.30]$) between mothers' nonstandard work schedule and children's expressive language at 24 months.

Similar results were found in the model exploring longitudinal associations between maternal nonstandard work schedules and children's expressive language. A negative association was found between nonstandard work schedules at 24-months and children's scores on the Preschool Language Scale at 36-months ($\beta = -.12$, $p = .05$). That is, in comparison to working standard day work hours, mothers working nonstandard work schedules at 24 months had children with lower expressive language skills at 36 months. Also, more maternal education at 24 months ($\beta = .37$, $p < .001$) and lower income-to-need ($\beta = -.16$, $p < .05$) was associated with better expressive language skills at 36 months (becomes non-significant in the final model).

To assess whether the association between mothers' nonstandard work schedules at 24 months on children's expressive language at 36 months operated indirectly through its effect on the parenting environment, we added positive engagement and negative work-family spillover from the 24 month timepoint in Model 2 and conducted formal tests of mediation. With the inclusion of positive engagement ($\beta = .21$, $p < .001$) and negative work-family spillover ($\beta = -.15$, $p < .05$), the effect of nonstandard work schedules was no longer significant, consistent with the notion of full mediation ($\Delta F = 7.55$, $p < .001$). The final model, including all predictors (covariates, the maternal work schedule variable, and parenting), accounted for 16% of the variance in children's expressive language at 36 months, $F = 5.77$, $p < .001$. Formal tests of mediation showed that the joint ($z = -1.77$, 95% CI $[-3.27, -.63]$) and individual effect of positive engagement ($z = -1.08$, 95% CI $[-2.41, -.28]$) and negative work-family spillover ($z = -.69$, 95% CI $[-1.84, -.11]$) mediated the association between mothers' work schedule at 24 months and children's expressive language at 36 months.

Discussion

This study demonstrates the value of utilizing an ecologically based model to explore the associations between maternal work schedules and children's early expressive language ability within a single ethnic group sample. The primary purpose of this study was to examine factors related to the parenting environment as mechanisms through which mothers' work schedules shape children's expressive language outcomes among African American families. Although our design does not permit us to address causation, our findings are consistent with a scenario that nonstandard work schedules are associated with detrimental effects on children's early expressive language (Han, 2008; Hsueh & Yoshikawa, 2007; Phillips, 2002). Also, we uniquely identified maternal positive engagement and negative work-family spillover as proximal, intervening variables through which the association between mother's work schedules and children's expressive language ability may be accounted for more accurately.

In this study, maternal positive engagement mediated the negative association between maternal nonstandard work hours at 24 months and children's expressive language outcomes at 24 and 36 months. Consistent with our hypotheses, maternal positive engagement mediated the association between nonstandard work schedule and children's NDW at 24 months. Our findings suggest that stressful job conditions, like nonstandard work schedules, may adversely affect developmental outcomes for young children by decreasing African American mothers' engagement in sensitive and cognitively stimulating parenting behaviors. Previous work has suggested that mothers who are stimulating and verbally engaged with their children during play and day-to-day interactions, have children with more advanced language skills (Beals & DeTemple, 1993; Hann, Osofsky, & Culp, 1996; Hart & Risley, 1995). When mothers interact with their young children in a contingent,

responsive and positive manner, mothers facilitate children's task of matching words to their referents, foster joint attention, and support overall learning (Tamis-LeMonda & Bornstein, 2002; Tamis-LeMonda, Cristofaro, Rodriguez, & Bornstein, 2006).

These findings are congruent with evidence in majority White and middle-class samples that parental employment in nonstandard schedules is associated with greater parenting stress and lower-quality parenting environments (Hsueh & Yoshikawa, 2007; Lleras, 2008; Strazdins et al., 2006). Furthermore, previous research supports that the association between maternal employment in nonstandard schedules and children's developmental outcomes is attenuated through proximal processes like maternal sensitivity and engagement (Han, 2005; Joshi & Bogen, 2007). We found evidence of long-term links between maternal employment in nonstandard work schedules at 24 months and children's expressive language on a standardized measure of expressive language at 36 months, the PLS-4. The cumulative effects of parental employment in nonstandard work schedules across the early childhood period may have implications for children's expressive language as they enter formal schooling. Thus, longitudinal examinations of nonstandard shifts as a context for parenting and possible links to gaps in language development and later achievement warrant further investigation, particularly in African American samples.

Contrary to expectations, negative work-family spillover did not mediate the negative association between maternal employment in nonstandard schedules and children's number of different words at 24 months; however, mediation of the nonstandard schedule-expressive language association was evident when children were 36 months of age. It is suspected that work-family stressors may have stronger implications for developmental outcomes as children get older and require more directed attention (Heymann & Earle, 2001). Moreover, by 36 months of age, children begin to acquire words exponentially and use more intelligible words. When family environments are optimal, children will acquire language with greater facility; however, for children living in stressful contexts, objective work demands like nonstandard shift schedules may indirectly impinge on children's developmental outcomes through more proximal variables that represent the psychologically draining characteristics of employment (Daniel et al, 2009; McLoyd et al., 2008; Rosenbaum & Morett, 2009). These findings are consistent with theories on work-family relationships and family stress models linking life stress associated with poverty to less sensitive parenting and delayed child outcomes (McLoyd, 1990; McLoyd et al., 2008).

Limitations

Results from this study need to be interpreted with several limitations in mind. First, our sample consisted of families living in poor, rural households which limit the generalizability of our results. Second, although we controlled for a number of maternal and household demographic variables, it is likely that selection bias was not completely eliminated in this study. Not all mothers have the opportunity to choose their work shift; scarcity of employment within rural communities may mean that mothers will take any available job to support the household when their children are young, even if the job is low-quality and labor intensive (Brody & Flor, 1997). Moreover, low-income workers typically have fewer job options and less job control and as a result, they are more likely to be in households that are affected by stressful work conditions like nonstandard work schedules (Henly & Lambert, 2005; Henly, Schaefer, & Waxman, 2006). Third, we can't rule out potential omitted variable bias. It is possible that the association between work conditions and family outcomes may be correlated with other characteristics of rural contexts, where the transportation infrastructure and availability of social resources for mothers with young children is limited. For example, time pressures mothers experience in transit to work (e.g., distance to work) and the ability to create routines around child care could not be ruled out as factors impinging the association between work in nonstandard schedules and child

outcomes (Gassman-Pines, 2011; McLoyd et al., 2008). Fourth, our measurement of nonstandard schedules was derived from a point-in-time assessment of employment and the extent to which this reflects maternal work schedules over time is not clear. The inconsistent nature of mothers' employment (i.e., employed vs. unemployed) in this study's low-income sample did not allow for an analysis that might indicate the cumulative nature of risks associated with employment in nonstandard schedules across the early childhood period. Nonetheless, future studies using longitudinal measures of mother's employment is warranted. Finally, although previous research indicates that a dichotomous measure of shift schedules may more accurately reflect the often erratic or inconsistent nature of low-income parents' work routines (Henly & Lambert, 2005; Joshi & Bogen, 2007), future studies with larger sample sizes may allow researchers to tease apart evening, night, weekend, and rotating schedules to gain a better understanding of nonstandard work schedules and their differential implications for mothers with young children.

Implications and Future Directions

Despite these limitations, the findings of this study have potential implications for policy and practice. Workers with nonstandard schedules keep the economy running 24/7 by providing a range of services including nursing care, protection from crime, and keeping stores open late (McLoyd & Enchautegui-de-Jesus, 2005; Presser, 2003b). African American women are overrepresented in jobs with nonstandard work schedules, yet very few quantitative studies have explored associations between parental work schedules and child outcomes within the African American community (for exception see McLoyd et al., 2008). The current study expands on previous research by conceptualizing nonstandard work schedules as a distal social context which shapes children's expressive language outcomes through proximal parenting processes in African American families. Mothers who experience psychological or physiological manifestations of stress while working nonstandard schedules may have difficulties providing a rich, engaging home environment for their young child; thus, nonstandard schedules can be viewed as a risk factor for children's early language achievement. The findings of this study suggest the need for programs like Mocha Moms, a national organization dedicated to supporting women of color through the challenges of childrearing with parenting resources and social support (Crowley & Curenton, 2011). Although Mocha Moms tends to focus on the experiences of middle-income women, it stands out as a model that could be adapted to improve child outcomes in low-income households by promoting language rich parent-child interactions and building a sense of community by providing an outlet for mothers to discuss strategies for balancing the demands of a nonstandard work schedule and parenting. Han (2005) suggests that associations between mothers' nonstandard schedules children's cognitive outcomes might also depend on the type of care children receive outside of the parenting context. Because children of mothers who work nonstandard schedules tend to be cared for by fathers or through arrangements other than center-based child care (Gassman-Pines, 2011; Han, 2005; Presser, 2003b), they are less likely to receive the benefits that early education programs provide. Maternal shift work status could be used as a factor in determining children's eligibility for early childhood programs where they may be able to receive high quality language interventions. More detailed studies are needed to explore the impact of social resources, like parenting groups and early child care, as a buffer of the negative association between parents' employment in nonstandard schedules and children's developmental outcomes.

Summary

Maternal employment in night, evening, and weekend schedules will continue to grow as the United States economy further expands as a 24/7 consumer market. As a result, researchers have begun to explore how parents who work nonstandard schedules balance family and

work pressures with increasing interest. Thus, despite its limitations, our study makes a very important contribution to the literature regarding African American families and child development. We corroborated findings of previous studies indicating that maternal employment in nonstandard schedules is negatively associated with children's early expressive vocabulary in a sample of African American families living in areas of high rural poverty. As such, we have filled a gap in the literature by focusing on links between the work schedules of women consistently overrepresented in low-quality, labor intensive jobs that pay menial wages, family processes, and child outcomes. Moreover, we identified mediators of the association between nonstandard work schedules and children's expressive language ability at 24 and 36 months of age. Future studies should examine workplace factors that support high-quality parenting and mitigate work-family spillover on mothers of young children.

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Highlights

- Maternal nonstandard work schedule was negatively associated with children's expressive language.
- The negative association was mediated by maternal positive engagement and negative work-family spillover.
- There are complex links between mothers' work environments and African American children's developmental outcomes.

Table 1
Descriptive Statistics for Child Expressive Language and Household Characteristics by Work Schedule

	Full Sample		Standard Schedule		Nonstandard Schedule	
	% or Mean	SD	% or Mean	SD	% or Mean	SD
Dependent Variables^a						
Child NDW at 24 months	18.96	17.57	21.45	18.61	14.92	14.97
Child PLS at 35 months	96.02	13.47	97.87	14.58	93.09	10.94
Independent Variables at 24 Months^b						
Type of Work Schedule	--	--	62%	--	38%	--
Total Work Hours	37.24	10.52	37.19	10.37	37.32	10.83
Income-to-needs	1.56	1.11	1.69	1.23	1.35	0.84
Lives in NC	97%	--	97%	--	97%	--
Enrolled in Child Care	91%	--	94%	--	86%	--
Child Age	25.44	1.99	25.47	1.98	25.41	2.01
Maternal Education	12.72	1.48	12.91	1.62	12.42	1.17
Positive Engagement	2.50	0.97	2.66	1.00	2.25	0.86
Neg. Work-Family Spillover	9.63	3.72	9.15	3.27	10.42	4.23

Note: NDW= Number of different words and PLS= Preschool Language Scale

^a n = 231;

^b n = 250

Table 2

Correlation Matrix for Analyses Predicting Child Expressive Language

	1	2	3	4	5	6	7	8	9	10	11
1 Income-to-needs ratio	---	.02	-.02	.03	.52***	.29***	-.15*	.11*	.04	.09	.07
2 Lives in NC		---	.14*	-.06	.00	-.00	.00	.04	-.05	.13*	.01
3 Child Age			---	.15*	-.02	.00	-.01*	.03	.08	.15*	.03
4 Enrolled in Child Care				---	.04	-.02	-.12	-.01	-.02	.04	.08
5 Education					---	.13*	-.16*	.24***	-.09	.12	.31***
6 Total Hours Employed						---	.01	-.01	.04	.07	.03
7 Works Nonstandard Schedule							---	-.21***	.17**	-.18**	-.17**
8 Positive Engagement								---	.06	.23***	.29***
9 Neg. Work-Family Spillover									---	-.03	-.16*
10 NDW at 24 months										---	.45***
11 PLS Score at 36 months											---

* $p < .05$.

** $p < .01$.

*** $p < .001$

Note. NDW = Number of different words and PLS = Preschool Language Scale $n=231$ for NDW and PLS; $n = 250$ for all other variables

Table 3
 Hierarchical Regression Predicting Child Expressive Language at 24 and 36 Months (n=231)

Variables ^a	Number of Different Words at 24 months						Preschool Language Scale at 36 months					
	Model 1			Model 2			Model 1			Model 2		
	B	SEB	β	B	SEB	β	B	SEB	β	B	SEB	β
Income-to-needs ratio	-0.21	1.34	-0.01	-0.32	1.33	-0.02	-1.86*	0.91	-0.16	-1.54	0.89	-0.13
Lives in NC	10.36	6.68	0.10	11.10	6.64	0.11	2.11	4.96	0.03	1.40	4.82	0.02
Child Age	1.22*	0.58	0.14	1.05	0.58	0.12	0.43	0.43	0.06	0.43	0.42	0.06
Enrolled in Child Care	1.82	4.16	0.03	2.75	4.10	0.04	2.53	2.83	0.06	2.94	2.75	0.07
Education	1.28	0.94	0.11	0.65	0.96	0.05	3.44***	0.69	0.37	2.78***	0.69	0.30
Total Hours Employed	0.11	0.11	0.07	0.14	0.11	0.08	0.04	0.08	0.03	0.05	0.08	0.04
Works Nonstandard Schedule	-5.71*	2.37	-0.16	-4.45	2.43	-0.12	-3.44*	1.77	-0.12	-1.67	1.78	-0.06
Positive Engagement				4.10**	1.49	0.19				2.95***	0.89	0.21
Neg. Work-Family Spillover				-0.05	0.30	-0.01				-0.56*	.23	-0.15
n			231			231			231			231
R ²			.05			.08			.11			.16
F for change in R ²						3.79*						7.55***

* $p < .05$

**

$p < .01$

$p < .001$

^a All independent variables measured at 24 months.