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THE FAMILY LIFE PROJECT KEY INVESTIGATORS

Paternal Work Characteristics and Father-Infant Interactions in Low-Income, Rural Families

To examine the implications of paternal occupational conditions for the quality of father-infant interactions, home visits, including interviews and videotaped observations of father-infant interactions, were conducted with 446 fathers living in six low-income, nonmetropolitan counties in North Carolina and Pennsylvania. When a variety of individual and demographic characteristics were controlled for, a less supportive work environment was associated with lower levels of fathers' engaged and sensitive parenting. Significant interactions pointed to the importance of understanding combinations of risk fac-

tors. Experiencing high levels of workplace stressors, including low levels of self-direction and high levels of care work, in the presence of other individual or demographic risk factors was associated with lower levels of father parenting quality.

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Key Words: families and work, fathers, occupational stress, paternal employment.

Over the past several decades, researchers have moved beyond studies of employment *status* to examine specific workplace *conditions* that may shape family relationships. These studies have been guided in part by role stress theory (e.g., Bolger, DeLongis, Kessler, & Wethington, 1989), which holds that experiences of stress in the workplace often spill over into the home, negatively impacting individuals and families. Collectively, studies examining role stress in the workplace suggest that exposure to chronic work stressors may be associated with lower quality relationships between workers and their family members, including lower quality parent-child interactions (e.g., Greenberger, O'Neil, & Nagel, 1994; Repetti, 1994).

Despite increasing interest in workplace conditions and parenting quality, most studies have focused primarily on mothers (e.g., Luster, Rhoades, & Haas, 1989) or dual-earner couples with school-aged children or adolescents (e.g.,

Crouter, Bumpus, Maguire, & McHale, 1999). Few investigations have examined how workplace stress may shape fathers' engaged and sensitive parenting with their infants (for exceptions, see Costigan, Cox, & Cauce, 2003; Volling & Belsky, 1991). This is an important omission, as previous research suggests that fathers' sensitivity and engagement across infancy and early childhood are associated with numerous child development outcomes, including infant-father attachment quality (Cox, Owen, Henderson, & Margand, 1992), toddlers' confident and enthusiastic exploration during play (Cox, Paley, & Towe, 2003), and young children's early social, cognitive, and language development (NICHD Early Child Care Research Network, 2004; Tamis-LeMonda, Shannon, Cabrera, & Lamb, 2004).

Additionally, most studies examining the implications of workplace experiences for parent-child interactions have focused on middle-class families from suburban or urban communities, ignoring low-income families living in nonmetropolitan areas. Approximately 7.5 million low-income Americans live in nonmetropolitan areas, 14.2% of the total rural population (U.S. Department of Agriculture, 2004). Considering the effects of workplace experiences for low-income fathers living in nonmetropolitan areas is important, as these individuals are disproportionately more likely to work at low-complexity, low-wage jobs (Gibbs, Kusmin, & Cromartie, 2005), jobs that have been linked to lower levels of paternal sensitivity and responsive parenting (Greenberger et al., 1994).

The current study sought to address these limitations by examining associations between multiple paternal workplace stressors and fathers' levels of engaged and sensitive interactions with their infants in a large sample of predominantly low-income families living in nonmetropolitan communities. Consistent with role stress theory, which suggests that experiences of workplace stress negatively impact both individual psychological resources and the quality of parenting behaviors, we examined whether greater exposure to workplace stressors was associated with lower levels of father engaged and sensitive parenting, as well as whether these associations were mediated by paternal well-being. Further, as experiences of work stress are unlikely to have uniform impacts on all fathers (Repetti, 2005), we examined whether these associations varied as a function of several individual and demographic risk factors.

Links Between Fathers' Occupational Conditions and Quality of Parenting

Research examining associations between occupational conditions and parenting has identified numerous aspects of the workplace environment that may shape parents' interactions with their young children. The current review focuses on previous research on fathers' employment characteristics and interactions with their young children, although because of the relative dearth of literature on this topic, research on fathers' interactions with older children will also be included where relevant.

Occupational self-direction. Occupational self-direction reflects the degree to which the occupation permits employees to work independently, with minimal direct supervision, on complex, nonroutinized tasks (Kohn & Schooler, 1982). Previous research (e.g., Parcel & Menaghan, 1994b) suggests that parents with lower levels of occupational complexity provide lower-quality home environments for their children, including less warmth and cognitive stimulation, than parents in jobs high in complexity and autonomy. Further, research suggests that fathers in occupations low in self-direction have lower quality interactions with their children. For example, Greenberger et al. (1994) found that lower occupational complexity, challenge, and stimulation in the workplace were associated with lower levels of fathers' positive, warm, and responsive behavior with children ages 5 – 7. Similarly, Curtner-Smith, Bennett, and O'Rear (1995) found that lower job complexity predicted lower paternal sensitive behaviors and higher paternal intrusive behaviors with preschool-age children.

Care work. Care work reflects the degree to which employees engage in activities related to the care of others, including care giving, helping the sick, and dealing with angry or physically aggressive individuals. Compared to the general population, individuals working in high care-work jobs, such as nurses or certified nursing assistants, have higher mortality and suicide rates as well as more stress-related illness and physical illness (e.g., Harris, 1989). Role stress theory suggests that the high stress associated with these occupations may reduce the personal resources parents can devote to their children, resulting in less sensitive and engaged interactions. Although to date no research has examined effects of care

work on parenting across a large range of occupations, studies of fields high in care work offer insight into the potential negative associations between care work and parent-child interactions. For example, Gelsema, van der Doef, Maes, Akerboom, and Verhoeven (2005) noted that individuals in the nursing profession often report high levels of job stress and strain, with one recent study of over 1,000 employed nurses finding that 80% reported experiences of "high" or "very high" mental strain (Pettersson, Arnetz, Arnetz, & Hörte, 1995). Job stress, in turn, has been associated with reports of physical and mental health problems, including increased levels of emotional exhaustion and psychological distress (Gelsema et al.).

Police work is another care work occupation in which individuals are frequently subjected to job-related stressors. In a study of 828 police officers (Burke, 1994), psychological burnout associated with police work predicted higher levels of psychosomatic symptoms and negative emotional states. Further, job stress and psychological burnout experienced by police officers has been linked to lower-quality marital interactions and higher rates of domestic violence in families of police officers (Johnson, Todd, & Subramanian, 2005; Roberts & Levenson, 2001). Collectively, these findings in the police and nursing literatures suggest that experiences of high job strain across a variety of care work occupations may have negative implications for parents' relationships with other family members.

Non-supportive work environment. Previous research suggests that a lack of workplace supports, including flexible work arrangements and the presence of coworker and supervisor interpersonal support, is associated with lower-quality parent-child interactions. A recent meta-analysis of over 60 studies found that lower schedule flexibility was associated with higher levels of work-family and family-work conflict for men and women (Byron, 2005). Volling and Belsky (1991) found that lower levels of reported work-family support, including lower coworker support, was associated with lower levels of father engagement with their infants. This study stands out as one of only a few to use objectively coded observations of father-infant interactions, but the sample was relatively small ($n = 119$) and limited to White, working- and middle-class fathers. Finally, in an examination of the effects of daily and chronic stress experiences

on the quality of father-child interactions, Repetti (1994) found when fathers experienced less supportive work environments, including negative interactions with supervisors and coworkers, they demonstrated lower levels of positive regard and higher levels of negative regard for their school age children.

Paternal Role Overload: A Potential Mediator

Role stress theory suggests that workplace stressors may negatively impact parenting quality through their influence on parents' own well-being. Recent research examining associations between work characteristics and parent-child relationships has found that the negative effects of work stress on parenting quality are mediated by parental well-being (e.g., Crouter et al., 1999; Galambos, Sears, Almeida, & Kolaric, 1995). In particular, previous research by Crouter and colleagues suggests that experiences of work-related pressure may lead to increased feelings of role overload—that is, the feeling that there is too much to do and not enough time to do it. Feelings of role overload, in turn, were related to conflictual parent-offspring relationships and, in turn, lower offspring well-being. The current study examined whether associations between work characteristics and father-infant interaction quality were mediated by paternal role overload.

Moderating Factors: Individual and Demographic Characteristics

Not all individuals respond to work stressors in the same manner (Repetti, 2005). Role stress theory (e.g., Menaghan, 1983) suggests that the impact of stressors varies depending on specific individual and demographic resources available to individuals, as well as the amount of time individuals are exposed to stress. Previous research supports this theory, finding that associations between work characteristics and family processes vary as a function of the presence or absence of specific individual and demographic risk factors such as low education and long work hours (e.g., Parcel & Menaghan, 1994a, 1994b). The current study examined whether the effects of paternal work characteristics varied as a function of fathers' education and work hours, as well as rurality, a potential stressor unexamined previously by work-family researchers.

Education level. As noted by Gibbs et al. (2005), education is a key indicator of personal resources

and, as such, is highly predictive of employment in jobs characterized by occupational complexity, low levels of routinization, and more formal and informal work supports. Previous research suggests that associations between maternal overtime hours and increased child behavior problems were reduced for mothers with higher levels of education (Parcel & Menaghan, 1994b). These findings suggest that high levels of education may buffer individuals from the negative effects of workplace stressors and, conversely, that low education may serve as a risk factor, exacerbating the negative outcomes associated with work stress.

Work hours. Most research has found no direct association between work hours and the quality of parent-child relationships (e.g., Pleck, 1997). Long work hours, however, may serve as a risk factor in combination with other negative work conditions (Barnett, 1998). In other words, although long work hours alone may not be detrimental to parenting, high levels of exposure to jobs low in complexity or high in stress may have a negative impact on fathers. Indeed, working 50 or more hours per week as a nursing assistant in a nursing home, an occupation characterized by high levels of job stress, was associated with a fourfold increase in depression (Geiger-Brown, Muntaner, Lipscomb, & Trinkoff, 2004). These findings suggest that exploring the effects of work hours in combination with other occupational conditions may uncover specific links between work hours and the quality of father-infant interactions.

Rurality. A disproportionate number of low-skill, low-complexity jobs are found in rural areas (Gibbs et al., 2005), with the result that individuals in rural contexts may have difficulty moving out of low-quality jobs or face long commutes to find jobs in more urban areas. Further, geographically isolated families may have fewer personal and community supports available to offset some of the negative impacts of work stressors (Dill, 2001). Although no research to date has examined rurality as a potential moderator of work conditions, we explored whether greater rural isolation exacerbated the negative impact of workplace stressors on parenting.

Demographic Characteristics

We controlled for a number of factors that previous research suggests may be associated with

differences in the quality of parent-infant interactions. We controlled for child gender because research suggests that fathers may interact differently with sons and daughters (e.g., MacDonald & Parke, 1986), as well as father age and marital status, as previous research suggests that older and married fathers may be more engaged and sensitive during interactions with their children (e.g., Parke, 2002). Further, we controlled for race, as minority group status may be associated with other stressors, such as discrimination, that may impact the quality of the home environment (e.g., Parcel & Menaghan, 1994b), as well as maternal employment status, given previous research that suggests that maternal employment may be associated with lower-quality father-infant interactions (e.g., Grych & Clark, 1999). Because we were interested in workplace conditions, we controlled for paternal wages to hold constant economic resources. Finally, because the data were collected in two states that represented quite different living environments, state was controlled.

Research Questions

Consistent with role stress theory, as well as previous research on occupational stressors and family relationships, we hypothesized that experiences of workplace stress, both individually and in combination with other personal and demographic risk factors, would be associated with lower-quality father-infant interactions. Specifically, two research questions were addressed:

1. Holding constant relevant background characteristics (child gender, marital status, maternal employment status, and father race and wages), are lower levels of paternal occupational self-direction, workplace supportiveness, and higher levels of care work associated with lower levels of fathers' observed engagement and sensitivity, and are these associations mediated by paternal feelings of role overload?
2. Do the associations between workplace characteristics (self-direction, care work, and workplace supportiveness) and fathers' engagement and sensitivity differ as a function of other risk factors, including lower education, longer work hours, and greater geographic isolation?

METHOD

Participants

The current study focused on families participating in an ongoing, longitudinal study examining the implications of rurality, economic resources, and family relationships for young children's development. The overall sample included 1,292 families living in six predominantly non-metropolitan counties in North Carolina and Pennsylvania. One hospital was selected in each county for participant recruitment. If there was more than one hospital in a county, the recruitment hospital was selected at random, with the probability of selection weighted to be proportional to the size of the hospital. For 1 year, project recruiters visited all mothers in the hospital who had given birth the day before. Mothers were given a pamphlet describing the project, and demographic information pertaining to household income, language use, and race was collected. Families that did not speak English as a primary language, lived outside the six study counties (or were planning to move), or did not have custody of the target child were ineligible for participation. Eligible families were entered into a lottery for selection into the study. Low-income (<200% of the poverty line) and African American families were oversampled in order to address our research goals. A total of 5,471 women were identified by hospital recruiters and, of these, 3,956 (72%) families were eligible for participation. Of these families, 2,691 (68%) were willing to be considered for participation, 1,571 (58%) families were selected for participation, and 1,292 (82%) participated at the first data collection point when the target child was 2 months of age.

The current study focused on families with an employed biological father of the target child. Data from home visits conducted when the target child was 6 months of age were used because this was the first visit to include fathers. Of the 1,292 families who participated in the 2-month home visit, 1,204 (93%) participated in the 6-month home visit, and 546 (45%) of these included an employed male caregiver who was the biological father of the target child. Not surprisingly, given the selection criteria, these families were significantly more likely to have both the biological mother and father in the home and had significantly higher levels of education and household income relative to the overall sample. Of these

546 families, 100 families were dropped from these analyses because of (a) missing data (i.e., missing data for the freeplay interaction, $n = 43$, 7.8%; the Occupation Information Network [O*Net] job codes, $n = 24$, 5.3%; the Geographic Information System [GIS] rurality measure, $n = 15$, 2.7%; father hourly wages, $n = 7$, 1.5%; or education level, $n = 3$, 0.7%), (b) the father identifying his primary race as something other than White or African American ($n = 4$, 0.9%), or (c) extreme outliers as defined by diagnostic statistics ($n = 4$, 0.9%). Thus, the current analyses focused on 446 families. On average, fathers included in the current analyses had significantly higher levels of education, $t = 3.67$, $S.E. = 0.29$, $p < .001$, and more supportive work environments, $t = -3.46$, $S.E. = 0.27$, $p < .01$, than fathers excluded from the analyses.

Table 1 provides the means and standard deviations for the variables of interest. The majority of fathers were White (82%), married (80%), and had an average education level equivalent to a high school degree plus some additional training. Slightly more infants were boys (51%) than girls (49%).

Procedure

When the target child was approximately 6 months of age, trained interviewers conducted two in-home visits, approximately 1 week apart. Visits lasted approximately 2 – 3 hours and involved collecting questionnaire and observational data on mother, target child, and father, where applicable. All questionnaire data, including detailed information on all jobs at which parents worked for 5 or more hours per week, were collected using laptop computers. Semi-structured interactions were videotaped for later coding. Written consent was obtained from parents prior to conducting home visits (for a detailed description of sample selection and data collection procedures, see Crouter et al., 2006).

Measures

Individual and demographic characteristics

Background information. Parents provided information on race, wages, marital status, and the relationship of each household member to the target child. A log transformation was applied to the paternal wages variable to correct for nonnormality.

Table 1. Means, Standard Deviations, and Percentages for Individual, Family, and Demographic Characteristics (N = 446)

Variables	M	SD	Range	%
Father education	15.41	2.53	4.00 – 22.00	
Father hourly wages	\$15.21	\$8.75	\$3.58 – \$84.29	
Father role overload	3.35	1.04	1.00 – 5.00	
Father primary work hours	44.54	9.99	7.00 – 82.00	
Father low self-direction	62.85	21.37	17.06 – 98.13	
Father care work	24.31	18.56	1.00 – 85.00	
Father nonsupportive work environment	0.00	2.48	–6.87 – 7.63	
Father engaged parenting	2.84	0.78	1.00 – 5.00	
Father sensitive parenting	3.46	0.54	2.00 – 5.00	
Rurality	5839.65	3877.15	894.78 – 20202.89	
Marital status				
Married (n = 376)				79.60
Cohabiting (n = 90)				20.40
Child gender				
Female (n = 218)				48.90
Male (n = 228)				51.10
Father race				
White (n = 366)				82.10
African American (n = 80)				17.90
Mother employment status				
Not employed (n = 178)				40.00
Part-time (n = 97)				21.70
Full-time (n = 171)				38.30
State				
North Carolina (n = 172)				38.6
Pennsylvania (n = 274)				61.4

Maternal employment status. Mothers reported the total number of hours worked at their primary job; maternal employment status was defined categorically as (a) not employed (0 hours), (b) part-time employment (<35 hours), or (c) full-time employment (35+ hours).

Paternal workplace characteristics

Occupational self-direction and care work. Objective measures of paternal occupational self-direction and care work in the workplace were constructed using data from the Occupational Information Network (O*Net; Peterson et al., 2001), an online database created by the U.S. Department of Labor to replace the Dictionary of Occupational Titles (DOT; U.S. Department of Labor, 1991). The self-direction measure contained 16 items rated on a 100-point scale, including those representing occupational complexity (e.g., “making decisions, solving problems”; “develop objectives, strategies”) and management (e.g., “coordinate, lead others”;

“guide, direct, motivate others”). For the current analyses, self-direction was reverse coded, such that higher scores reflected lower levels of self-direction. In the current sample, jobs lowest in self-direction included production laborers, retail order fillers, and assembly line workers. The care work factor contained four items rated on a 100-point scale related to caring for or assisting others, including “dealing with physically aggressive people,” “assist, care for others,” and “exposed to disease or infections.” In the current sample, jobs highest in care work included corrections officers, psychiatric aides, and registered nurses. Reliability was assessed by having two trained coders independently code 137 unique jobs in the data set. Interrater reliability was acceptable; interclass correlations (ICC) = .83 and .90 for self-direction and care work, respectively. Internal consistency was also acceptable; $\alpha = .98$ and .86 for self-direction and care work, respectively (for further information about these scales, see Crouter et al., 2006).

Nonsupportive work environment. Fathers completed three measures related to workplace supportiveness of their primary job. Fathers completed a modified, four-item version of the Flexible Work Arrangements Scale (Bond, Galinsky, & Swanberg, 1998; sample item: "At my place of employment, employees who put their family or personal needs ahead of their jobs are not looked on favorably"). Responses were rated on a 4-point scale ranging from *strongly agree* to *strongly disagree*; items were reverse scored such that higher scores reflected less workplace flexibility. Additionally, fathers completed two 9-item subscales from the Moos Work Environment Scale (Moos, 1986): the Co-Worker Support Scale (e.g., "People go out of their way to make a new employee feel comfortable") and the Supervisor Support Scale (e.g., "Supervisors usually compliment an employee who does something well"). Responses were rated on a 4-point scale ranging from *strongly agree* to *strongly disagree*; items were reverse scored such that higher scores reflected less support.

Bivariate analyses showed a high degree of intercorrelation among the three measures of workplace support (r s ranged from .46 to .61). Additionally, factor analysis results revealed that all three measures loaded onto a single factor. Thus, they were combined into a single, global measure of nonsupportive work. Mean scores for each individual scale were standardized and summed to create the composite measure ($\alpha = .77$).

Mediating factors

Role overload. Paternal experiences of role overload were assessed using a modified, six-item version of the Role Overload Scale (Reilly, 1982), which measures the respondent's sense of having too many commitments and not enough time to attend to them (e.g., "There are too many demands on my time"). Responses were rated on a 5-point scale ranging from *strongly agree* to *strongly disagree*; items were reverse scored such that higher scores reflect greater overload ($\alpha = .91$).

Moderating factors

Paternal education. Fathers reported the highest level of education obtained to date on a scale ranging from *less than high school* to *Ph.D.*

Paternal work hours. Fathers reported the total number of hours worked at their primary

job. In cases where fathers worked more than one job, the primary job was defined as the job at which they worked the greatest number of hours per week.

Rurality. Relative geographic isolation (rurality) was calculated for each family using Global Positioning Systems (GPS) technology. GPS coordinates (latitude and longitude) were calculated for the primary residence of each participating family. This information was then plotted on Geographic Information Systems (GIS) maps to create measures of the distance between each primary residence and 10 different community assets, specifically the nearest elementary school, high school, supermarket, county seat, doctor's office (any), freeway onramp, library, public park, gas station, and fire station. Distances (measured in meters) were calculated by superimposing 400×400 m grids onto each of the six study counties, as well as all surrounding contiguous counties. Results of factor analyses suggested that the individual distances could be combined to form a single, global index of rurality. Scores were calculated by taking the mean distance across all 10 items and then calculating the log of that score to correct for nonnormality ($\alpha = .88$; range = 895 – 20,203 m).

Father-infant interaction quality

Paternal engagement and sensitivity. A free-play interaction involving fathers and their infants was videotaped for 10 minutes following a procedure used in other research (Cox, Paley, Payne, & Burchinal, 1999). Fathers were given a set of toys and instructed to play with the child as they normally would if they had a little free time during the day. Interactions were later coded to assess levels of fathers' warm, energetic engagement and sensitivity toward their child. Ratings for each code were made on a 1 – 5 scale, ranging from *not at all characteristic* to *highly characteristic*. On the basis of the results of factor analyses conducted with an oblique rotation (i.e., Promax), *paternal engagement* was defined as the mean of fathers' scores for four characteristics: detachment (reverse scored; level of emotional uninvolved or disengagement), positive regard (level of positive feelings expressed toward child), animation (level of energy or excitement), and stimulation for development (appropriate level of scaffolding of activities with child). *Paternal sensitivity* was defined as the mean of fathers' scores for three

characteristics: sensitivity (level of responsiveness to child's needs, gestures, and expressions), intrusiveness (reverse scored; degree to which father imposed his own agenda on the interaction), and negative regard (reverse scored; level of negative feelings expressed toward child). Thus, the engagement variable at the high end represented fathers who were positive, energetic, stimulating, and attentive to their child and at the low end represented fathers who were detached, low in warmth and positive feeling, low in energy, and low in stimulation. For the sensitivity variable, at the high end were fathers who followed the child's lead, did not impose their own agenda, and did not show harsh or negative affect and at the low end were fathers who intruded on the child's actions, did not follow the child's lead, and were negative and harsh. Reliability was determined by calculating interclass correlation coefficients for ratings made by two coders to approximately 30% of the tapes randomly drawn at the 6-month assessment period. Reliability was acceptable for both engagement (ICC = .87) and sensitivity (ICC = .68).

RESULTS

Hierarchical regression analyses were conducted to examine the links between paternal job characteristics and paternal engagement and sensitivity. Theoretically relevant controls were entered into the model in the first step. Workplace characteristics were then entered into the model in a second step, to examine associations with parenting quality after controlling for specific factors that may select fathers into jobs. Next, bivariate and regression analyses were conducted to determine whether associations between paternal workplace characteristics and father-infant interaction quality were mediated by fathers' feelings of role overload. Finally, we examined whether associations between workplace characteristics and father-infant interaction quality varied as a function of education, rurality, and fathers' weekly work hours. Interaction terms were first examined individually. Next, final models were created by entering all interaction terms that had been significant in either the engagement or sensitivity models on their own. Post hoc tests of significant interactions were examined following Aiken and West (1991).

Table 2 presents the intercorrelations of the variables of interest. Paternal job characteristics were generally related in ways that would be expected. Jobs with higher wages had higher levels of self-direction and workplace supports. Further, jobs lower in self-direction were also lower in care work. Better educated fathers and White fathers were more likely to work jobs with higher wages and higher levels of self-direction, care work, and workplace supports. Paternal engagement and sensitivity were modestly correlated. Neither parenting measure varied according to child gender. The engagement and sensitivity dimensions were related to several paternal job characteristics. Specifically, working a job with a more supportive workplace environment and higher self-direction was associated with higher levels of engagement and sensitivity. Although the size of the correlations was modest (*rs* ranged from .11 to .17), note that they reflect associations between fathers' perceptions of their work environments, objective measures of fathers' work environments, and objective ratings of the quality of fathers' interactions with their infants during a 10-minute freeplay situation.

Are Paternal Work Characteristics Related to Fathers' Engagement and Sensitivity?

As shown in Table 3 (Model 1), paternal education and rurality were associated with overall levels of father engagement: Better-educated fathers exhibited higher levels of engagement whereas fathers living in more rural areas exhibited lower levels of engagement. Additionally, White fathers were rated as being more engaged compared to African American fathers. Examining main effects for workplace characteristics, a less supportive workplace environment was negatively associated with levels of paternal engagement. There was no association between low self-direction or care work and levels of father engagement.

As shown in Table 3 (Model 1), African American fathers exhibited lower levels of sensitive parenting compared to White fathers. There were no other associations between personal and demographic characteristics and levels of father sensitivity. Examining main effects for workplace characteristics, a less supportive workplace environment was negatively associated with levels of paternal engagement. No associations were found

Table 2. Correlations of Fathers' Occupational Conditions, Father and Child Individual and Background Characteristics, and Quality of Father-Infant Interactions (N = 446)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Child gender ^a	—													
2. State ^b	.02	—												
3. Rurality	.04	-.13**	—											
4. Marital status ^c	-.01	.04	-.06	—										
5. Father education	.02	.19**	-.04	-.33**	—									
6. Father race ^d	-.03	-.53**	-.16**	.11*	-.27**	—								
7. Father role overload	-.01	.16**	.08†	-.14**	.13**	-.23**	—							
8. Father hourly wages	.05	.10*	.06	-.35**	.48**	-.19**	.06	—						
9. Father primary work hours	.03	.02	.14**	-.17**	.08	-.06	.23**	.06	—					
10. Father low self-direction	-.03	-.01	-.02	.20**	-.37**	.16**	-.04	-.21**	-.09†	—				
11. Father care work	.02	.06	-.01	-.12	.26**	-.09*	-.03	.07	.02	-.61**	—			
12. Father nonsupportive work	.03	-.01	-.03	.11*	-.15**	.13**	.19**	-.19**	-.04	.13**	.004	—		
13. Father engaged parenting	.03	.06	-.06	-.08†	.20**	-.19**	.03	.10*	.04	-.13**	.09*	-.17**	—	
14. Father sensitive parenting	-.02	.07	.03	-.14**	.18**	-.23**	.04	.17**	.08	-.11*	.06	-.16**	-.20**	—

^aGender: 0 = female, 1 = male. ^bState: 0 = North Carolina, 1 = Pennsylvania. ^cMarital Status: 0 = married, 1 = cohabiting. ^dRace: 0 = White, 1 = African American. †p < .10. *p < .05. **p < .01.

between low self-direction or care work and levels of father sensitive parenting.

Are Associations Between Fathers' Work Characteristics and Levels of Engagement and Sensitivity Mediated by Paternal Feelings of Role Overload?

Consistent with approaches to testing mediation suggested by Baron and Kenny (1986), we first examined bivariate associations in order to determine whether fathers' reports of workplace support were related to their feelings of role overload, and whether feelings of role overload, in turn, were associated with levels of fathers' engaged and sensitive parenting. As shown in Table 2, a less supportive work environment was associated with greater levels of paternal role overload ($r = .19, p < .01$). Role overload, however, was not associated with paternal levels of engaged ($r = .03, ns$) or sensitive parenting ($r = .04, ns$). Further, hierarchical regression analyses identical to those found in Model 1 of Table 3 were estimated for engaged and sensitive parenting, respectively, with role overload added to the model. The addition of role overload to the models did not result in a significant reduction in the association between nonsupportive work and paternal engaged parenting or sensitive parenting. Thus, there was no support for a mediational model.

Do Associations Between Work Characteristics and Father-Infant Interactions Differ as a Function of Specific Individual and Demographic Risk Factors?

As shown in Table 3 (Model 2), two significant interactions emerged for paternal engagement: low self-direction \times rurality, $B = -.005, S.E. = .002, \beta = -.09, p < .05$, and care work \times paternal education, $B = .002, S.E. = .001, \beta = .10, p < .05$. Follow-up tests of the self-direction \times rurality interaction revealed that, for fathers living in more rural areas, paternal engagement was significantly lower when their level of self-direction in the workplace was lower ($t = -2.00, S.E. = .04, p < .05$). For fathers living in less rural areas, self-direction and paternal engagement were unrelated ($t = -1.08, S.E. = .04, ns$). Additionally, follow-up tests of the care work \times education interaction revealed that, for fathers who were less educated, paternal

Table 3. Hierarchical Regression Coefficients for Equations Predicting Paternal Engaged and Sensitive Parenting (N = 446)

Variables	Engaged Parenting						Sensitive Parenting					
	Model 1			Model 2			Model 1			Model 2		
	B	SE B	β	B	SE B	β	B	SE B	β	B	SE B	β
Step 1												
Child gender ^a	.03	.07	.02	.002	.07	.001	-.04	.05	-.04	-.03	.05	-.03
State ^b	-.15	.09	-.09	-.12	.09	-.08	-.08	.06	-.07	-.07	.06	-.07
Rurality	-.12	.06	-.11*	-.11	.06	-.09†	-.01	.04	-.02	-.01	.04	-.02
Marital status ^c	-.02	.10	-.01	-.02	.10	-.01	-.07	.07	-.05	-.06	.07	-.03
Mother part-time work ^d	-.06	.10	-.03	-.09	.10	-.05	-.06	.07	-.05	-.07	.06	-.06
Mother full-time work ^e	.07	.08	.05	.10	.08	.06	-.02	.06	-.02	-.01	.06	-.02
Father education	.04	.02	.14*	.04	.02	.14*	.02	.01	.08	.01	.01	.07
Father race ^f	-.43	.12	-.21**	-.41	.12	-.20**	-.32	.08	-.23**	-.31	.08	-.21**
Father hourly wages	.01	.09	.004	-.03	.09	-.02	.09	.06	.08	.08	.06	.07
Father primary work hours	.002	.004	.03	.003	.004	.03	.002	.003	.05	.002	.003	.03
Change in Adj. R ²	—						—					
Adj. R ²	.053**						.067**					
Step 2												
Father low self-direction	.0001	.002	.001	-.001	.002	-.03	-.0001	.002	-.003	-.0003	.002	-.01
Father care work	.002	.002	.04	.0001	.003	.001	.0004	.002	.01	.0002	.002	.01
Father nonsupportive work	-.04	.01	-.14**	-.04	.01	-.14**	-.02	.01	-.10*	-.02	.01	-.11*
Change in Adj. R ²	.014*						.004					
Adj. R ²	.067**						.07**					
Step 3												
Father low self-direction × rurality				-.005	.002	-.09*				-.002	.002	-.06
Father care work × father education				.002	.001	.11*				-.0001	.001	-.01
Father care work × father work hours				.002	.0002	.004				-.0004	.0002	-.12*
Change in Adj. R ²	.013*						.011*					
Adj. R ²	.080**						.081**					

Note: All variables in Model 2 were centered at their means.

^aChild gender: 0 = female, 1 = male. ^bState: 0 = North Carolina, 1 = Pennsylvania. ^cMarital status: 0 = married, 1 = cohabiting. ^dMother part-time work: 0 = not employed, 1 = part-time employment. ^eMother full-time work: 0 = not employed, 1 = full-time employment. ^fFather race: 0 = White, 1 = African American.

† $p < .10$. * $p < .05$. ** $p < .01$.

engagement was significantly lower when fathers worked jobs that were higher in care work ($t = -2.15$, $S.E. = .04$, $p < .05$). In contrast, for fathers who were better educated, paternal engagement was significantly higher when fathers worked jobs higher in care work ($t = 2.19$, $S.E. = .04$, $p < .05$).

Finally, as shown in Table 3 (Model 2), one significant interaction emerged for paternal sensitivity: care work × work hours, $B = -.0004$, $S.E. = .0002$, $\beta = -.12$, $p < .05$. Follow-up tests revealed that, for fathers who worked more hours, paternal sensitivity was lower when levels of care work were higher ($t = 1.79$, $S.E. =$

$.04$, $p < .10$), although this association was a nonsignificant trend. For fathers working fewer hours, care work and paternal sensitivity were unrelated ($t = -1.61$, $S.E. = .04$, ns).

DISCUSSION

The purpose of this study was to examine the implications of paternal occupational conditions for the quality of fathers' interactions with their 6-month-old infants. Results were consistent with our hypotheses, suggesting that several workplace characteristics were associated with levels of paternal engagement and sensitivity,

although in several instances, such associations depended upon personal and contextual characteristics of the father. No evidence was found, however, that role overload mediated the associations between workplace characteristics and parenting quality.

Consistent with role stress theory (e.g., Bolger et al., 1989), a less supportive workplace environment was associated with lower levels of both engagement and sensitivity during father-infant freeplay interactions. Although the current findings are consistent with findings from previous research (e.g., Volling & Belsky, 1991), this is the first study to find that a nonsupportive workplace environment may be harmful to the quality of father parenting in a predominantly low-income, rural sample of fathers. Note that the interaction data were rated by independent coders, so these associations do not reflect correlated paternal self-reports of workplace environment and relationship quality.

Although the current study hypothesized that associations between paternal workplace stressors and parenting quality would be mediated by fathers' feelings of role overload, there was no support for this hypothesis, a finding inconsistent with previous research (e.g., Crouter et al., 1999; Galambos et al., 1995). Perhaps workplace experiences shape paternal well-being in other ways. For example, workplace stress may affect daily mood, leaving fathers too fatigued or inwardly focused to be as engaged and sensitive as they might be otherwise (Repetti, 1994). In future research it will be useful to collect a broad array of parental well-being measures to better understand the specific links between work stress, well-being, and parenting.

Results from the moderation analyses suggested that occupational self-direction and care work were associated with levels of paternal engagement and sensitivity in the presence of other risk factors. Specifically, lower occupational self-direction was associated with lower paternal engagement, but only for fathers of families living in more rural areas. This finding is consistent with role stress theory (e.g., Bolger et al., 1989) and corroborates previous research that found that lower occupational complexity was associated with less positive and supportive parenting in older children (e.g., Greenberger et al., 1994), although these studies did not examine differences in effects of self-direction as a function of geography. Low levels of self-directed work may matter more for fathers living

in more rural areas because the greater geographic and social isolation associated with rurality may make fathers more vulnerable to the negative effects of low self-directed work (Dill, 2001) or because these fathers have fewer opportunities to leave undesirable jobs.

Additionally, performing high levels of care work was associated with lower levels of paternal engagement, but only for fathers with less education. This finding, consistent with role stress theory (e.g., Menaghan, 1983), extends previous research by linking experiences of care work to the quality of father-infant interactions. In the current sample, high care work jobs for fathers with lower levels of education were often high stress, low-skill jobs, such as nursing assistants or psychiatric technicians, involving physically and interpersonally demanding tasks (Geiger-Brown et al., 2004). Providing care in these types of occupations may result in high levels of job strain for these fathers, which in turn may result in lower levels of positive parenting. Additionally, low education may serve as a barrier to finding higher quality employment; less educated fathers in our sample may have had difficulty leaving high care work employment.

In contrast, performing high levels of care work was also associated with higher paternal engagement for better-educated fathers. This finding was surprising and does not support previous research, which suggests that working jobs higher in care work may be a risk factor for lower parenting quality. In the current sample, however, high care work jobs for well-educated fathers included physical therapists and child, family, and school social workers. Although these jobs involve spending a significant amount of time caring for or assisting others, these occupations are likely to have fewer workplace stressors than care work occupations typically examined in industry specific studies, such as certified nursing assistants and police officers. This finding also suggests that when examining effects of care work across a broad range of occupations, it is necessary to consider other characteristics that can distinguish high care work jobs that are low in work stress from those that are high in work stress.

The current study has a number of strengths, including the use of a predominantly lower- and working-class sample of rural fathers with infants, a population rarely examined in the work and family literature. Additionally, objective measures of several workplace characteristics

including occupational self-direction and care work were examined, improving upon previous research, which has relied extensively on self-report measures of the workplace. The study also used videotaped observations of father-infant interactions, rated by objective coders to assess engagement and sensitivity, rather than relying on paternal reports of relationship quality. Thus, the associations reported here, albeit modest in size, suggest that workplace stressors matter for the quality of father-infant interactions. Also, note that fathers omitted from the current sample because of missing data had lower levels of education and higher levels of nonsupportive work compared to fathers included in the current analyses, suggesting employed fathers not included in these analyses may have been at greater risk for lower quality interactions with their infants, on average, than fathers included in the current analyses.

Several limitations must be noted, however. First, the variables included in these models explain a relatively low level of the total adjusted variance in parenting. It is possible that other proximal and distal factors not included in the current models, such as parental relationship quality, paternal personality characteristics, child temperament, and maternal work characteristics, would account for additional variation in father parenting quality (Belsky, 1984). Additionally, the data were cross-sectional. A longitudinal study would be beneficial for examining how workplace experiences are associated with the quality of father-child interactions throughout infancy and early childhood.

Overall, the current study suggests that characteristics of fathers' work environments are associated with fathers' engaged and sensitive interactions with their infants. In particular, perceptions of the workplace as nonsupportive appear to be directly associated with lower levels of paternal engagement and sensitivity. Further, low self-direction and care work were related to lower parenting quality in the presence of other risk factors. Future research should replicate these findings as well as examine these associations in fathers of older children. Going forward, research should focus on implications of father work for child developmental outcomes via their impact on parenting quality. Finally, studies should examine whether policies designed to increase workplace supports have positive benefits that extend beyond the workplace to improving the quality of fathers' relationships with their children.

NOTE

This research was supported by a grant from the National Institute of Child Health and Human Development (PO1-HD-39667), Lynne-Vernon Feagans and Martha Cox, Pls, with cofunding from the National Institute on Drug Abuse. The Family Life Project Key Investigators include Lynne Vernon-Feagans, Martha Cox, Clancy Blair, Peg Burchinal, Linda Burton, Keith Crnic, Nan Crouter, Patricia Garrett-Peters, Doug Granger, Mark Greenberg, Stephanie Lanza, Adele Miccio, Roger Mills-Koonce, Deborah Skinner, Cynthia Stifter, Lorraine Taylor, Emily Werner, and Mike Willoughby. We thank Nissa Towe-Goodman and Peg Burchinal for their helpful suggestions on previous versions of this paper.

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