

## Nonstandard Work Schedules and Developmentally Generative Parenting Practices: An Application of Propensity Score Techniques

By: Joseph G. Grywacz, Stephanie S. Daniel, Jenna Tucker, Jill Walls, [Esther Leerkes](#)

**This is the accepted version of the following article:**

Grzywacz, J.G., Daniel, S.S., Tucker, J.M., Walls, J. & Leerkes, E.M. (2011). Nonstandard work schedules and developmentally generative parenting practices: An application of propensity score techniques. *Family Relations*, 60(1), 45-59. doi: 10.1111/j.1741-3729.2010.00632.x,

which has been published in final form at <http://dx.doi.org/10.1111/j.1741-3729.2010.00632.x>.

**\*\*\*Reprinted with permission. No further reproduction is authorized without written permission from Wiley & the National Council on Family Relations. This version of the document is not the version of record. Figures and/or pictures may be missing from this format of the document. \*\*\***

### **Abstract:**

Data from the National Institute for Child Health and Human Development Study of Early Child Care (Phase I) and propensity score techniques were used to determine whether working full time in a nonstandard schedule job during the child's first year predicted parenting practices over 3 years. Results indicated that women who worked full time in a nonstandard schedule job during the first year had poorer maternal sensitivity at 24 and 36 months. Modest differences in Home Observation for the Measurement of the Environment scores were also observed at 36 months. The results provide strong evidence that full-time maternal employment in nonstandard schedule jobs may interfere with the creation and maintenance of developmentally generative parenting practices.

**Keywords:** health | life-span wellness | social relations and health | stress | work-family issues

### **Article:**

Parenting practices during infancy have substantial implications for infants, parents, and families. In early childhood, there is consistent evidence linking parenting practices like the creation of a warm and stimulating environment to infant health (Coulibaly, Séguin, Zunzunegui, & Gauvin, 2006) and cognitive and socioemotional development (Susman-Stillman, Kalkose, Egeland, & Waldman, 1996). Effective parenting during infancy also appears to have delayed effects that last into young adulthood (Sroufe, Egeland, Carlson, & Collins, 2005). Parenting activities that foster optimal child development also contribute to parental efficacy and other domains of parental well-being, thereby creating (at least) the potential for a positive feedback

loop whereby parental well-being reinforces subsequent use of effective parenting behaviors. Thus, parenting practices during infancy have both immediate and long-term implications for children, in part because they provide a foundation for a lifetime of effective parenting (Bell & Harper, 1977; Conger & Simons, 1997).

The social factors contributing to developmentally generative parenting practices or parenting behaviors that contribute to optimal child health and development in early childhood are less clear. In this study, we conceptualized parenting practices as a specific domain of parenting (Darling & Steinberg, 1993), and we sought to determine whether full-time maternal employment in a job where the work schedule exists outside the Monday through Friday 8-to-5 norm (Presser, 1995) undermines developmentally generative parenting practices during early childhood. Specifically, we sought to determine whether differences exist in maternal sensitivity and the creation of a nurturing and stimulating home environment between women with a full-time nonstandard work schedule and those in other work arrangements, including nonworking.

Practical and theoretical concerns guide the focus on nonstandard maternal work schedules. Practically, over 6 million women with young children work in jobs requiring a nonstandard work schedule (Bureau of Labor Statistics, 2005). The simple fact that nearly 14% of working mothers of infants are exposed to nonstandard schedules necessitates consideration of whether this work arrangement undermines developmentally generative parenting. Indeed, results from previous research suggest that nonstandard work schedules interfere with effective parenting (Heymann & Earle, 2001; Strazdins, Clements, Korda, Broom, & D'Souza, 2006). Other research, however, suggests no differences in parenting between mothers in standard and nonstandard work schedules (Barnett & Gareis, 2007). Interpreting results from previous research is challenging because entrance into maternal employment, particularly full-time employment in jobs requiring a nonstandard work schedule, is influenced by a variety of self- and social-selection processes. We applied propensity score matching procedures to minimize potential biases introduced by selection processes (D'Agostino, 1998; Rosenbaum & Rubin, 1983).

## **Background**

### **Conceptual Foundations**

Parenting is a complex and multidimensional phenomenon. In their influential synthesis of the parenting literature, Darling and Steinberg (1993) characterized two main aspects of parenting: parenting style and parenting practices. Although parenting style was conceptualized as a contextual variable reflecting the emotional climate of the parent-child relationship, parenting practices were conceptualized as specific behaviors used in parenting to achieve discrete and domain-specific goals related to child development. Parenting, from this point of view, therefore involves both affective and behavioral components; Darling and Steinberg argued that each

component is important because it has different putative effects on child outcomes. In this article, however, we focused on parenting practices.

Researchers have identified a wide variety of developmentally generative parenting practices. The provision of a stimulating and responsive home environment that engages children in exploratory or problem-solving behavior is believed to be valuable, in part because it is associated with enhanced cognitive outcomes like language development (Raviv, Kessenich, & Morrison, 2004) and performance in school (Hubbs-Tait, Culp, Culp, & Miller, 2002). Parental sensitivity or warmth and responsiveness to infants' social cues is also advocated because it strengthens the parent-child bond and contributes to enhanced socioemotional development (Dallaire & Weinraub, 2005) and peer acceptance (Morrison, Rimm-Kauffman, & Pianta, 2003).

Although researchers have identified parenting practices believed to promote optimal child development, less attention has been given to identifying antecedents of developmentally generative parenting. In the decades following the publication of Belsky's (1984) influential model of parenting, several researchers have examined how individual characteristics of parents and children, as well as contextual sources of stress and support, shape every aspect of parenting, including parenting practices. At the time Belsky proposed his model of parenting, he lamented the undifferentiated treatment of maternal employment. Since then, the "socialization of work" literature has developed, and it suggests that parenting is shaped by adults' work arrangements (see Perry-Jenkins, Repetti, & Crouter, 2000). Indeed, there is now a coherent body of evidence indicating that greater ability to exert judgment or control over work-related tasks is associated with more frequent reading to children as well as enhanced verbal development of children (Parcel & Menaghan, 1994). Other researchers noted that substantive complexity is associated with better self-reported parenting practices (MacDermid & Williams, 1997), parenting styles, and parental warmth and responsiveness (O'Neil & Greenberger, 1994).

Attention has recently turned to the potential implications of nonstandard work schedules for parenting. Nonstandard work schedules are those that require workers to perform their job-related activities outside the Monday through Friday 8-to-5 norm (Presser, 1995). Nonstandard schedules include fixed weekend days, fixed nights, and nonfixed schedules (e.g., rotating shifts). The potential implications of nonstandard work schedules for parenting is gaining attention because occupations requiring nonstandard schedules are projected to become more common (Hecker, 2001) and because a sizable proportion (13.2%) of mothers with children under the age of 6 are employed in a job requiring a nonstandard work schedule, most of whom (8.5%) work evenings or nights (Bureau of Labor Statistics, 2005).

There is substantial reason to believe that nonstandard maternal work schedules undermine positive parenting. Conceptually, ecological systems theory (Bronfenbrenner, 1979) draws attention to the work-family meso-system and argues that the unique niche created by that meso-system shapes behavior and development (see Voydanoff, 2001). Applied to parenting, ecological theory suggests that a challenging work-family arrangement, such as parenting an

infant while working in a nonstandard schedule job, creates multiple barriers to the acquisition and maintenance of developmentally generative parenting practices. Nonstandard schedules create temporal barriers to effective parenting, especially when parents work full time. Establishing and maintaining family rituals and patterns of parent-child interaction is difficult when work schedules change (Fagan, 2001; Kalleberg & Epstein, 2001). Similarly, nonstandard schedules can interfere with regular routines such as putting children to bed or engaging in family-related activities (La Valle, Arthur, Millward, Scott, & Clayden, 2002; Zerubaval, 1985).

Nonstandard schedules can also leave individuals exhausted and poorly equipped to parent. Rotating shifts interfere with circadian rhythms and sleep cycles (Pilcher, Lambert, & Huffcutt, 2000) thereby contributing to physical exhaustion, which has been linked to poor family functioning (Fenwick & Tausig, 2001; Khaleque, 1999; Perry-Jenkins, Goldberg, Pierce, & Sayer, 2007). The psychological toll of nonstandard work schedules, especially when they require a full-time commitment or greater than 30–35 hours per week, can also leave workers feeling guilty about not spending enough time with their children, concern that they might miss out on important developmental milestones, and dissatisfaction about their lack of time for themselves and their partners (LaVelle et al., 2002). These feelings and appraisals can interfere with mothers' ability to respond sensitively to their infants (Crnic & Low, 2002; Seifer & Dickstein, 2000). In sum, nonstandard work schedules create temporal barriers, and they undermine parents' vitality and ability to engage in developmentally generative parenting.

### **Empirical Foundations**

Relatively little research has examined variation in parenting practices by maternal employment in nonstandard schedule jobs, and none of this research has focused on parents of infants. Results from an exploratory study of nurses indicated no differences in parenting among mothers of school-aged children who worked days relative to those who worked the evenings (Barnett & Gareis, 2007). In contrast, results from a large Canadian cohort with children aged 2 to 11 years indicated that mothers (and fathers) with a nonstandard schedule job reported more frequent use of hostile or ineffective parenting practices than their counterparts with standard work schedules (Strazdins et al., 2006). Furthermore, ineffective parenting accounted for 42% of the association between nonstandard maternal work schedules and child behavioral problems. Others reported that the total quality of home environment for children aged 5 to 10 years was lower for evening-shift mothers (Heymann & Earle, 2001). The pattern of results in this small literature suggests less developmentally generative parenting among mothers in nonstandard work schedule jobs compared to those with a standard work schedule.

One challenge to drawing strong conclusions from the accumulated evidence linking maternal work schedules with parenting practices is that researchers have not fully appreciated the complex selection processes underlying maternal employment in jobs requiring a nonstandard schedule. Maternal employment in general, and employment in nonstandard schedule jobs in particular, is not randomly assigned (Presser, 2004; Repetti, Matthews, & Waldron, 1989).

Rather, diverse and possibly competing selection processes determine who enters a job requiring a nonstandard schedule. Nearly one tenth of workers (8.2%) with a nonstandard schedule job self-select into nonstandard schedules because it is believed to provide a better arrangement for family or child care (Bureau of Labor Statistics, 2005). This is illustrated by women working the night shift or weekends to save on child-care expenses.

Other individuals have few labor force opportunities because of limited educational attainment or little formal training (Presser, 2004) and, therefore, find themselves “forced” into a job requiring a nonstandard work schedule (i.e., social selection). Han (2008) reported that several indicators of socioeconomic hardship increased the odds of working in a job requiring nonstandard hours. Specifically, women with less education, those who were unmarried at the birth of their child, those with more years living in a single family household, and having greater years reliant on welfare support were all associated with having ever worked in a job requiring a nonstandard work schedule. The problem is that many of the processes related to selection into nonstandard schedules, both social selection and self-selection, also underlie parenting practices. It is clear, for example, that intensive mothering beliefs promote self-selection into nonstandard work schedules because it enables mothers to be with their children during the day while remaining fully engaged in the labor force (Hattery, 2001). Likewise, members of socially marginalized groups are disproportionately represented in nonstandard schedule jobs, but they are also less likely to engage in generative parenting practices (Raviv et al., 2004). Research will likely produce inconsistent results if these competing selection processes are not adequately addressed.

### **The Present Study**

The primary goal of this study was to understand the potential influence of full-time employment in a nonstandard schedule job on mothers' developmentally generative parenting practices. We treat all types of nonstandard work schedules as being comparable in terms of their potential effects on developmentally generative parenting. It is possible that some types of nonstandard schedules, such as fixed nights, may affect parenting behaviors differently from other types, such as rotating schedules; however, consistent with previous research (Daniel, Grzywacz, Leerkes, Tucker, & Han, 2009; Han, 2005; Strazdins et al., 2006), we posited that all types of nonstandard work schedules undermine positive parenting. We also focused on exposure to nonstandard maternal work schedules during the infants' first year, because more intense early exposure in terms of full-time versus part-time employment has greater potential to interfere with the initiation and maintenance of developmentally generative parenting practices (Daniel et al.; Waldfogel, Han & Brooks-Gunn, 2002). Drawing on ecological theory, we hypothesized that full-time employment in jobs requiring nonstandard maternal work schedules undermines developmentally generative parenting practices, such that maternal employment in a job requiring a nonstandard schedule during the first year will predict lower levels of maternal sensitivity and poorer quality of the home environment.

Propensity score procedures were used to minimize potential biases in estimated associations that result from competing selection processes involved in women's entrance into a nonstandard schedule job. Propensity scores are the conditional probability of an individual being assigned to one group as opposed to one or more others on the basis of a set of observed covariates (Rosenbaum & Rubin, 1983). In our application, propensity scores represent the relative likelihood that an individual will be employed in a job requiring a nonstandard schedule. The logic behind using propensity scores as opposed to observed values is that propensity scores simulate a quasi-randomized experiment (D'Agostino, 1998). That is, propensity scores balance individuals on relevant observed variables, like education and parenting attitudes, such that two people with similar propensity scores only differ in terms of which "treatment" they find themselves in. Propensity scores, therefore, allow researchers to better delineate putative effects of "treatments," like employment in a job requiring a nonstandard schedule on outcomes, because they minimize selection biases between comparison groups (Diaz & Handa, 2006; Smith & Todd, 2001). Indeed, Rosenbaum and Rubin demonstrated that propensity scores reduced selection biases by more than 90%. A secondary goal of this article was to demonstrate the utility and application of propensity score procedures.

## **Method**

### **Data and Sample**

The data for this study were from the National Institute for Child Health and Human Development Study of Early Child Care (NICHD SECC). The NICHD SECC began in 1991 and was intended to study the effects of various forms of nonmaternal child care on a child's development over time. Participants of the study included 1,364 children (born between January and November of 1991) and their mothers. Prospective study families were sampled from all births in randomly selected 24-hour birth intervals in 24 hospitals within the vicinity of 10 data collection sites across the country. Enrollment in the study proceeded through three steps: (a) hospital screening of mother-newborn dyads within 48 hours of birth to determine whether the mother and infant met study eligibility criteria (e.g., absence of serious medical complications for the infant; infant not being placed for adoption), (b) 2-week follow-up telephone calls to mother-infant dyads deemed eligible from the hospital screening to determine eligibility and willingness to participate in the study, and (c) successful completion of an in-home interview when the child was approximately 1 month of age. Individuals who completed the 1-month interview were enrolled in the first phase of the study ( $N = 1,364$ ) and followed through 36 months with primary data collection occurring at 1, 6, 15, 24, and 36 months.

The study sample was not designed to be nationally representative, but does include a variability of race, ethnicity, and economic background. At enrollment, 75% of the sample children were non-Hispanic White ( $n = 1,042$ ), 12.8% were non-Hispanic Black ( $n = 173$ ), and 6.6% were Hispanic ( $n = 83$ ), with the remainder being Asian, Native American, and individuals of multiple races. Nearly 30% of mothers in the sample had a high school degree or less, one third reported

some college, and 35% of the sample reported having a bachelor's or graduate degree. Nearly 20% of families received public assistance at enrollment in the study. Because of the selection procedures, some disadvantaged groups were excluded from the sample (mothers under 18, not fluent in English, with a substance abuse problem, or living in dangerous neighborhoods). The sample also overrepresents non-Hispanic White children and families on public assistance in contrast to U.S. families in general. Between enrollment and the close of the first project phase when children were 36 months, 131 families (9.6%) were lost to follow-up, with slightly greater attrition among children in racial and ethnic minority families.

The sample used to generate the propensity of being employed full time in a nonstandard schedule job was limited to mothers with complete information on all study variables (see Measures;  $N = 968$ ). Mothers' average age at the time of giving birth to their infants was 28.9 years ( $SD = 5.4$ ). For most of the women in this analytic sample the focal child was their first (43.7%), 37.5% had one older child, and the remaining women had two or more children older than the focal child. Over one half of the analytic sample (55.1%) graduated from high school or reported completing "some college," few participants (6.2%) reported having less than a high school degree, and 38.7% reported graduating from college. Approximately one in seven participants (16.1%) were classified as being a member of a racial or ethnic minority group. The majority of mothers (85.3%) in this sample were employed outside the home during the year before the focal child was born, and they worked 35.8 hours per week ( $SD = 12.3$ ).

## **Variables**

**Parenting variables.** Maternal sensitivity was constructed from data obtained from video-taped observations of semi-structured free-play sessions collected at 6, 15, 24, and 36 months in the laboratory and coded on a 4-point scale. At 6, 15, and 24 months, mother ratings were coded for sensitivity to nondistress, positive regard, and intrusiveness (reverse scored). At 36 months, mother ratings were coded for supportive presence, respect for autonomy, and reflected hostility. The mean value for the three dimensions was computed, with higher scores indicating greater maternal sensitivity. These composite scores have been reported to have good internal consistency and inter-rater reliability (NICHD Early Child Care Research Network, 1998).

The overall quality of the home environment was assessed at 6, 15, and 36 months using the Infant/Toddler and the Early Childhood version of the Home Observation for the Measurement of the Environment (EC-HOME; Caldwell & Bradley, 1984), respectively. The Infant/Toddler HOME, used at 6 and 15 months, contains 45 items and six subscales, whereas the EC-HOME Inventory, which was used at the 36-month assessment, contains 55 items and eight subscales. Both instruments assess the quality and quantity of stimulation and support available to a child in the home environment. All items are scored in binary fashion (yes/no). The Infant/Toddler HOME and the EC-HOME share four subscales, including responsiveness (e.g., parent responds verbally or vocally to a child's verbalizations or vocalizations), acceptance (e.g., parent does not scold or criticize child during the visit), learning materials (e.g., push or pull toy available), and

variety (e.g., parent reads stories to child at least three times weekly). The Infant/Toddler HOME Inventory also contains two unique subscales including organization (e.g., child gets out of house at least four times a week) and involvement (e.g., parents structuring a child's play periods), whereas the EC-HOME Inventory contains four unique subscales, including language stimulation (e.g., child is encouraged to learn the alphabet), physical environment (house is reasonably clean and minimally cluttered), academic stimulation (child is encouraged to learn colors, numbers, and patterned speech), and modeling (e.g., TV is used judiciously). Items summed across all subscales produce a total score indicating overall quality of inputs and interactions the child receives at home ( $\alpha > .75$  at all three assessments).

**Independent variable.** A five-category work schedule variable was created from responses to questions asked during the 1-, 3-, 6-, 9-, and 12-month interviews about work schedule and hours per week worked on all jobs. The first category reflected individuals who did not work at all during the first year of their infant's life. The second and third categories were both part-time workers (i.e., average work hours across the 6-, 9-, and 12-month interviews were less than 35 hours per week) but differed in terms of whether they work in a standard (Category 2) or nonstandard (Category 3) schedule. Likewise, the fourth and fifth categories were both full-time workers (i.e., average hours across the first year were 35 hours per week or more), but they differed in terms of their job requiring a standard versus a nonstandard schedule. An individual was classified as having a nonstandard schedule if they indicated working a schedule other than 7:30 a.m.–5:00 p.m. during at least one of the five interviews during the infant's first year. Our decision to differentiate full time and part time was based on previous research suggesting that the effects of nonstandard schedules may be more pronounced among those who work full time (Daniel et al., 2009). Using these criteria, 203 women (20.9%) were classified as not having worked outside the home during the child's first year (Nonworking), 218 (22.5%) worked part time and had a standard work schedule (SWS-PT), 189 (19.5%) worked part time and had a nonstandard work schedule (NSWS-PT), 266 (27.5%) worked full-time and had a standard work schedule (SWS-FT), and 92 (9.5%) worked full-time and had a nonstandard work schedule (NSWS-FT) during the child's first year of life.

**Selection variables.** A variety of variables reflecting selection factors that may shape entrance into a job requiring a nonstandard work schedule were used in constructing the propensity score model (see Analyses below). Selection variables were identified using both conceptual and practical decision rules. Conceptually, we were interested in variables that capture both self-selection and social selection into nonstandard work. Practically, we selected only variables that were assessed at the 6-month interview or earlier to ensure that the propensity score model was based primarily on variables measured temporally prior to assessments of nonstandard work schedules and parenting practices.

Variables intended to capture potential social selection into a job with a nonstandard work schedule included maternal age, racial/ethnic minority status, marital status, maternal education, whether the focal pregnancy was planned (yes vs. no), mothers' prebirth employment status

(employed vs. not) and occupation, hours worked per week prior to birth, number of weeks of paid maternal leave, and indicators of financial hardship, including poverty status at 1 month (yes/no), receipt of public assistance at 1 month (yes/no), and perceived financial resources. Mothers' self-reported reason for working (e.g., for financial purposes) or for staying home (e.g., don't need to work) were examined. Partner work schedule and usual work hours were examined, as were both maternal and partner perceived health at 1 month.

Several variables intended to capture potential self-selection into a nonstandard schedule job were included in analyses. Information regarding the level of happiness at the birth of the target child (1 = *somewhat* or *very*, 0 = *otherwise*) was obtained. The Parental Modernity Scale (Schaefer & Edgerton, 1985) was administered within 1 month at home and yielded two subscores including Progressive Beliefs and Traditional Beliefs. Progressive parenting beliefs reflect attitudes or preferences for self-directed child behavior (e.g., children learn best by doing things themselves rather than listening to others). In contrast, traditional parenting beliefs reflect attitudes in support of children following adult commands (e.g., children should not question the authority of their parents). The overall quality of the mother's intimate relationship with her partner was assessed at 1 month using the Love and Relationships Questionnaire (Braiker & Kelley, 1979), a 25-item measure assessing the degree to which partners experience conflict (e.g., how often do you and your partner argue?), enrichment or maintenance behaviors (e.g., how much do you tell your partner what you want or need from the relationship?), love (e.g., to what extent do you have a sense of belonging with your partner?), and ambivalence (e.g., how confused are you about your feelings toward your partner?) in the marital or close relationship. The perceived costs of maternal employment were assessed at 1 month using a subset of 11 items from the Beliefs about the Consequences of Maternal Employment for Children scale (Greenberger, Goldberg, Crawford, & Granger, 1988). Sample items include "children are less likely to form a warm and secure relationship with a mother who is working full time" and "working mothers are more likely to have children with psychological problems than mothers who do not work outside the home." Maternal personality including neuroticism, extraversion, and agreeableness was assessed using established instruments (Costa & McCrae, 1985) administered when the child was 6 months.

## **Analyses**

The basic process for using propensity scores involved two separate steps (D'Agostino, 1998). In the first step, propensity scores were calculated by fitting a logistic regression model predicting NSW-FT, the observed value where individuals were categorized as having a full-time nonstandard work schedule in the first year. In this analysis, it was necessary to identify variables reflecting both self- and social-selection processes that influence entry into a full-time nonstandard schedule job. This was accomplished by determining differences between women who were and were not classified from self-reports as having a full-time nonstandard work schedule using either a *t* test or chi-square test, depending upon the distribution of the variable. Several variables were found to differ by employment group, including personality

characteristics (agreeableness and extraversion), prebirth employment status, employment status prior to birth, prebirth occupation, needing to work for financial reasons, availability of paid maternity leave, and commitment to work. The primary objective in creating a propensity score model is to obtain the best possible estimate of having a full-time nonstandard work schedule (D’Agostino); consequently, all variables whose *p* value from bivariate tests of association was less than .20 were included in the initial propensity score model. The final model had good fit statistics (likelihood ratio chi-square 108.94; *df* 41; *p* < .0001) and 80% of the predicted probabilities were concordant with observed responses on the NSW-FT variable. Additional analyses indicated that differences observed in bivariate analyses were eliminated after controlling for the probability of having an NSW-FT (results available upon request).

After fitting the model to calculate propensity scores, the next step was to select from three basic strategies for how to use the computed scores, including matching, stratification, and covariance adjustment, each of which produces unbiased estimates of effects (D’Agostino, 1998). We chose matching because it provides a strong test of possible differences by employment arrangement. “Nearest neighbor” matching was implemented using a publicly available macro (Coca-Perrillon, 2007) that was programmed to identify two controls (i.e., non-NSWS-FT) for every case of NSW-FT to maximize power. After the matching procedure was completed, paired *t* tests were used to determine whether parenting behaviors at each time point differed between propensity score-matched pairs. Then, ordinary least-squares regression models were fit using the matched pairs data to determine whether differences in employment arrangements predicted parenting practices over time, controlling for earlier observations of parenting and contemporaneous nonstandard work schedule classification. Importantly, analyses presented in Tables 2–5 are based on the propensity score-matched sample, not the full NICHD SECC sample on which the propensity score was calculated.

**Table 2. Mean Differences in Maternal Sensitivity at 15, 24, and 36 Months Among Women in Full-Time Nonstandard Schedule Jobs Relative to Propensity Score Matched Women in Other Work Arrangements**

	15 Months		24 Months		36 Months	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
NSWS-FT	9.47	1.56	9.23*	1.56	16.40***	2.87
SWS-FT	9.50	1.60	9.62	1.61	17.47	2.32
NSWS-FT	9.60	1.41	9.29 <sup>†</sup>	1.60	16.47***	2.70

	15 Months		24 Months		36 Months	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
SWS-PT	9.48	1.58	9.64	1.57	17.56	2.61
NSWS-FT	9.50	1.53	9.34	1.61	16.47*	2.82
NSWS-PT	9.53	1.67	9.41	1.70	17.22	2.97
NSWS-FT	9.56	1.48	9.32	1.64	16.48*	2.84
Nonworking	9.30	1.69	9.13	1.78	17.27	2.77

Note: Sample size for each comparison (n = 184). NSWS-FT = nonstandard work schedule, full time; SWS-FT = standard work schedule, full time; SWS-PT = standard work schedule, part time; NSWS-PT = nonstandard work schedule, part time.

†p < .10.

\*p < .05.

\*\*\*p < .001 (two-tailed).

**Table 3. Mean Differences in Total HOME Scores at 15 and 36 Months Among Women in Full-Time Nonstandard Schedule Jobs Relative to Propensity Score Matched Women in Other work Arrangements**

	15 Months		36 Months	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
NSWS-FT	37.53 <sup>†</sup>	3.65	41.23 <sup>***</sup>	6.48
SWS-FT	38.18	3.82	43.15	5.65
NSWS-FT	37.54	3.71	41.54*	6.57
SWS-PT	38.10	4.69	42.99	6.76
NSWS-FT	37.70	3.58	41.25	6.65
NSWS-PT	37.76	4.03	42.16	6.79

	15 Months		24 Months		36 Months	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
NSWS-FT	37.61		3.62	41.20	6.69	
Nonworking	37.33		4.62	40.90	7.76	

Note: Sample size for each comparison (n = 184). NSWS-FT = nonstandard work schedule, full time; SWS-FT = standard work schedule, full time; SWS-PT = standard work schedule, part time; NSWS-PT = nonstandard work schedule, part time.

†p < .10.

\*p < .05.

\*\*p < .01 (two-tailed).

**Table 4. Regression Estimates of the Effect of Full-Time Employment in Jobs With a Nonstandard Work Schedule on Maternal Sensitivity at 15, 24, and 36 Months**

	15 Months		24 Months		36 Months	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Panel A. Standard work schedule, full-time comparison						
Constant	7.65	0.52	5.32	0.65	12.83	1.02
NSWS-FT	0.05	0.23	-0.51*	0.23	-0.78*	0.39
Sensitivity <sub>pv</sub>	0.21***	0.05	0.46***	0.07	0.50***	0.10
NSWS <sub>curr</sub>	-0.22	0.30	-0.09	0.30	-0.07	0.53
<i>R</i> <sup>2</sup>	0.05		0.21		0.14	
Panel B. Standard work schedule, part-time comparison						
Constant	8.08	0.52	6.27	0.73	12.58	1.02
NSWS-FT	-0.04	0.22	-0.51*	0.23	-0.73*	0.37

	15 Months		24 Months		36 Months	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Sensitivity <sub>pv</sub>	0.18 <sup>***</sup>	0.05	0.36 <sup>***</sup>	0.07	0.53 <sup>***</sup>	0.10
NSWS <sub>curr</sub>	-0.35	0.28	-0.05	0.27	-0.26	0.45
<i>R</i> <sup>2</sup>	0.05		0.12		0.15	

Panel C. Nonstandard work schedule, part-time comparison

Constant	7.30	0.60	5.48	0.65	12.34	1.06
NSWS-FT	-0.08	0.22	-0.37 <sup>†</sup>	0.23	-0.80 <sup>*</sup>	0.40
Sensitivity <sub>pv</sub>	0.26 <sup>***</sup>	0.06	0.43 <sup>***</sup>	0.07	0.54 <sup>***</sup>	0.11
NSWS <sub>curr</sub>	-0.21	0.21	-0.08	0.22	-0.40	0.38
<i>R</i> <sup>2</sup>	0.07		0.17		0.14	

Panel D. Nonworking comparison

Constant	6.72	0.89	4.53	0.83	10.30	1.35
NSWS-FT	0.66	0.44	0.10	0.30	-0.25	0.52
Sensitivity <sub>pv</sub>	0.24 <sup>**</sup>	0.09	0.49 <sup>***</sup>	0.09	0.71 <sup>***</sup>	0.15
NSWS <sub>curr</sub>	-0.16	0.35	-0.12	0.29	0.07	0.52
<i>R</i> <sup>2</sup>	0.07		0.23		0.15	

Note: NSW-FT = nonstandard full-time work schedule; Sensitivity<sub>pv</sub> = maternal sensitivity at previous visit; NSW<sub>curr</sub> = dichotomous nonstandard work schedule at the time of outcome assessment.

†*p* < .10.

\**p* < .05.

\*\**p* < .01.

\*\*\**p* < .001 (two-tailed).

**Table 5. Regression Estimates of the Effect of Full-Time Employment in Jobs With a Nonstandard Work Schedule on Total HOME Scores at 15 and 36 Months**

	15 Months		36 Months	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Panel A. Standard work schedule, full-time comparison				
Constant	22.48	2.00	12.05	4.44
NSWS-FT	-0.78	0.52	-1.57 <sup>†</sup>	0.82
HOME <sub>pv</sub>	0.43 <sup>***</sup>	0.05	0.50 <sup>***</sup>	0.11
NSWS <sub>curr</sub>	0.10	0.67	-2.10 <sup>†</sup>	1.10
<i>R</i> <sup>2</sup>	0.20		0.20	
Panel B. Standard work schedule, part-time comparison				
Constant	18.95	2.33	7.20	4.50
NSWS-FT	-0.43	0.57	-1.10	0.83
HOME <sub>pv</sub>	0.52 <sup>***</sup>	0.06	0.50 <sup>***</sup>	0.11
NSWS <sub>curr</sub>	-0.002	0.70	-3.25 <sup>***</sup>	0.99
<i>R</i> <sup>2</sup>	0.25		0.30	

Panel C. Nonstandard work schedule, part-time comparison

	15 Months		24 Months		36 Months	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Constant	19.89	1.85			8.65	4.65
NSWS-FT	-0.52	0.44			-1.47 <sup>†</sup>	0.91
HOME <sub>pv</sub>	0.50 <sup>***</sup>	0.05			0.50 <sup>***</sup>	0.13
NSWS <sub>curr</sub>	-0.28	0.42			-0.39	0.90
<i>R</i> <sup>2</sup>	0.31				0.21	

Panel D. Standard work schedule, nonworking comparison

Constant	18.61	2.99			2.21	5.55
NSWS-FT	-0.84	0.89			-0.29	1.08
HOME <sub>pv</sub>	0.54 <sup>***</sup>	0.08			0.85 <sup>***</sup>	0.18
NSWS <sub>curr</sub>	0.25	0.71			-2.68 <sup>*</sup>	1.13
<i>R</i> <sup>2</sup>	0.29				0.30	

Note: NSWS-FT = nonstandard full-time work schedule; HOME<sub>pv</sub> = HOME score at previous visit; NSWS<sub>curr</sub> = dichotomous nonstandard work schedule at the time of outcome assessment. <sup>†</sup>p < .10. \*p < .05. \*\*\*p < .001 (two-tailed).

## Results

Three patterns emerged from unadjusted comparisons of the parenting practice outcomes at 15, 24, and 36 months by employment classification (Table 1). Nonworking mothers had the lowest maternal sensitivity and HOME scores. Next, and consistent with our study hypothesis, there is evidence that full-time nonstandard work schedules during the first year may have delayed effects on parenting practices. Maternal sensitivity at 24 and 36 months was lower for mothers working full time in a nonstandard schedule job relative to those working full time in a standard schedule job. By 36 months, those who worked full time in a nonstandard schedule job during

the child's first year were less sensitive than those who worked part time in a standard schedule job, and they were less sensitive (although not statistically significant) than those who did not work. Mothers who worked full time in a nonstandard schedule job had lower HOME scores at 36 months than those who worked full time in a standard schedule job. Furthermore, although mothers with a full-time nonstandard schedule had HOME scores at 15 and 36 months that were comparable to mothers who did not work during the first year, those with a part-time nonstandard schedule had better scores than those who did not work at both time periods.

**Table 1. Unadjusted Parenting Practices at 15, 24, and 36 Months by Exposure to Nonstandard Maternal Work Schedules During Children's First Year of Life**

	<b>Nonstandard Schedule Full Time <i>M</i> (<i>SD</i>)</b>	<b>Standard Schedule Full Time <i>M</i> (<i>SD</i>)</b>	<b>Nonstandard Schedule Part Time <i>M</i> (<i>SD</i>)</b>	<b>Standard Schedule Part Time <i>M</i> (<i>SD</i>)</b>	<b>Nonworking <i>M</i> (<i>SD</i>)</b>
Maternal sensitivity					
15 months	9.40 (1.62)	9.53 <sup>b</sup> (1.53)	9.47 <sup>c</sup> (1.66)	9.56 <sup>a</sup> (1.52)	9.03 <sup>a,b,c</sup> (1.83)
24 months	9.09 <sup>a</sup> (1.79)	9.65 <sup>a,b</sup> (1.65)	9.48 <sup>d</sup> (1.68)	9.62 <sup>c</sup> (1.61)	8.78 <sup>b,c,d</sup> (1.90)
36 months	16.51 <sup>b,d</sup> (3.10)	17.45 <sup>c,d</sup> (2.41)	17.37 (2.80)	17.50 <sup>a,b</sup> (2.49)	16.71 <sup>a,c</sup> (3.16)
HOME score					
15 months	36.83 (4.49)	38.06 <sup>a</sup> (3.71)	37.46 <sup>c</sup> (4.22)	37.69 <sup>b</sup> (4.70)	36.19 <sup>a,b,c</sup> (5.73)
36 months	40.39 <sup>a</sup> (7.57)	42.86 <sup>a,b</sup> (5.82)	46.76 <sup>d</sup> (7.15)	42.17 <sup>c</sup> (7.21)	39.39 <sup>b,c,d</sup> (8.79)

Note: Estimates with common superscripts differ significantly ( $p < .05$ ), on the basis of one-way analysis of variance with Bonferroni post hoc comparisons.

Pairwise  $t$  tests examining differences in parenting among women with a nonstandard work schedule who worked full time in contrast to propensity score-matched women in other work circumstances reinforce the unadjusted results. There was no evidence that maternal sensitivity at 15 months differed by work arrangement (Table 2). At 24 months, women with a full-time

nonstandard schedule, however, were observed to be less sensitive than women with a full-time standard schedule job. Trend-level evidence ( $p < .10$ ) also suggests that women with a full-time nonstandard schedule job were less sensitive at 24 months than women with a part-time standard schedule. By 36 months, there was consistent evidence that women who worked full time in a nonstandard schedule job during the first year of their infant's life were less sensitive than women in any other employment arrangement.

Turning to mothers' ability to provide a nurturing and safe home environment, again there was little evidence at 15 months that maternal work arrangement makes a difference (Table 3). There was trend-level ( $p < .10$ ) evidence suggesting that HOME scores may differ among full-time working mothers by work schedule such that those with a nonstandard schedule have lower HOME scores than those with a standard schedule. At 36 months, robust differences in HOME scores were observed, such that women who worked full time in a nonstandard schedule job during the first year had poorer HOME scores than full-time and part-time women with a standard schedule. As hypothesized, results reported in Tables 2 and 3 provide consistent evidence that maternal exposure to full-time nonstandard work schedules during infants' first year of life predicts poorer parenting at 24 and 36 months.

Predictive models controlling for earlier observations of parenting outcomes and contemporaneous work schedules provide further evidence that early exposure to full-time nonstandard work schedules may have protracted effects on developmentally generative parenting practices. Controlling for maternal sensitivity at 15 months, women who worked full time in a nonstandard schedule job during their infants' first year demonstrated poorer maternal sensitivity at 24 months than women who worked full or part time in a standard schedule job (Table 4). By 36 months, there is consistent evidence indicating that sensitivity is lower among mothers who worked full time in a nonstandard schedule job relative to those in all other work arrangements except those who did not work at all. There, however, was little robust evidence that HOME scores differed meaningfully by maternal work arrangement in the first year. There was some trend-level evidence ( $p < .10$ ) suggesting that HOME scores are poorer among those with a full-time nonstandard schedule relative to those in a full-time standard schedule job and those working part time in a nonstandard schedule job (Table 5). There was some evidence that contemporaneous employment in a nonstandard schedule job at 36 months was associated with poorer HOME scores in the matched NSW-FT and nonworking mother sample and in the matched NSW-FT and SWS-PT sample.

## **Discussion**

The aim of this study was to determine whether nonstandard maternal work schedules during infants' first year of life undermined developmentally generative parenting practices in early childhood. The study was motivated by growing concerns over the expanding number of jobs requiring a nonstandard schedule (Hecker, 2001), evidence suggesting that women with young children are likely to occupy these jobs (Presser & Hermsen, 1996), and by strands of evidence

suggesting that nonstandard schedules may interfere with effective parenting (Han, 2005; Strazdins et al., 2006). Using methods designed to account for competing reasons mothers may find themselves in jobs with a nonstandard schedule, our results indicated that mothers' full-time involvement in nonstandard work schedules may interfere with developmentally generative parenting, particularly maternal sensitivity, among working mothers. The creation of a stimulating and supportive home environment may also be undermined by nonstandard work schedules, but this evidence was less clear and consistent.

The results of this study extend the literature examining the putative effects of nonstandard work schedules on parenting. Foremost, our findings indicated that full-time employment in jobs requiring a nonstandard work schedule during a child's first year of life may have small, yet robust, detrimental effects on developmentally generative parenting. Unlike previous research that relied on cross-sectional data (Strazdins et al., 2006), our results indicate that individuals who worked full time during their infant's first year in a job requiring a nonstandard work schedule had lower maternal sensitivity at 36 months in contrast to workers in all other employment arrangements. Furthermore, these results persisted even after controlling for earlier observations of maternal sensitivity and contemporaneous work schedules. Although children's overall access to sensitive caregiving from other family members and child-care providers remains unknown, these results present compelling evidence of a link between maternal full-time employment in job requiring a nonstandard work schedule and parenting practices. That is, the use of longitudinal data, the clear temporal sequencing of predictor (full-time nonstandard schedule work) and outcome assessed in a laboratory environment rather than self-report (sensitivity), tight statistical control to account for biases introduced by likely selection effects (Rosenbaum & Rubin, 1983), and adjustment for earlier observations of the outcome provide strong evidence that the time structure of maternal work during early infancy may “cause” differences in parenting behavior.

The overall pattern of results suggests that full-time employment in a job requiring a nonstandard schedule may undermine the foundation upon which generative parenting practices develops. This finding is consistent with a basic premise of ecological theory. That is, to the extent the workplace is a salient context for person-environment interactions and subsequent adult development, our results suggest that nonstandard maternal work schedule interferes with adults' ability to sustain developmentally generative parenting practices. It is noteworthy that there is no evidence of variation in maternal sensitivity or HOME scores by employment arrangement at 15 months. Differences in maternal sensitivity, however, begin emerging at 24 months, and a clear pattern is apparent at 36 months. Similarly, albeit less robustly, some differences in HOME scores begin to emerge at 36 months. This is consistent with previous research suggesting that parenting develops over time and is more open to change early in the child's life (Holden & Miller, 1999). It may be that the demands of full-time nonstandard employment in early infancy erode the affective quality of the developing parent-child relationship, and this comes to a head during the latter part of infancy because this is a particularly stressful time for parents involving

autonomy and compliance struggles with their children, increased expectations for the socialization of appropriate behavior, and a general decline in the extent to which parents enjoy parenting (Fagot & Kavanaugh, 1993).

Alternatively, it may be that the delayed effect of this type of employment on parenting is in part a child effect. That is, children of mothers in this sample who worked a nonstandard schedule in the first year were more likely to display behavior problems at 24 and 36 months (Daniel et al., 2009). These challenging child behaviors may undermine concurrent parenting quality. The possible mechanism contributing to the delayed impaired development of maternal sensitivity among those with a nonstandard work schedule is not immediately clear. It is possible that mothers with a full-time nonstandard schedule were too exhausted to sensitively respond to their infant's emotional cues (Crnic & Low, 2002; Seifer & Dickstein, 2000). The compromised ability to respond sensitively may be minor in the beginning (and therefore not significantly different), but it may accumulate to create a “slow fade” effect whereby parental behavior becomes entrained and potentially expands over time, thereby creating delayed differences in sensitivity at later points in childhood. Indeed, this is one interpretation of clear developmental trend for NSWS- FT across all the sensitivity models (Table 4): In all cases the estimated effect increases in magnitude. Future research specifically designed to explain the observed delayed differences in parenting behavior is needed.

Interestingly, the pattern of results suggests that parents' ability to provide a warm and stimulating environment, as measured by the HOME, may be less subject to developmental processes. Pairwise comparisons of HOME scores from propensity score-matched samples revealed that mothers who worked full time in a nonstandard schedule job had poorer HOME scores than those who worked full or part time in a standard schedule job. These differences, however, were largely attenuated once contemporaneous employment in a nonstandard schedule job was included in the model. These results are consistent with previous research with older children indicating that evening and night work was associated with poorer HOME scores (Heymann & Earle, 2001). In connection with this previous research using cross-sectional data, our longitudinal results suggest that the parenting-related consequences of nonstandard work schedules are largely immediate. That is, nonstandard schedule jobs present temporal barriers that may prevent parents from engaging in behaviors such as bedtime routines (e.g., book reading) or being able to quickly respond to children's needs. Because the longitudinal effects are attenuated once current employment is controlled, it seems as though parents are able to recover with minimal long-term consequences.

The results of this study also contribute to practical discussions of the effects of employment in nonstandard schedules on parenting and child development. Results reported in Tables 1–3 suggest that selection effects generally biased estimated means in a downward fashion. In all cases except for one, means reported for parenting practices in Table 1 are lower than those reported in Tables 2 and 3. In some cases, the attenuation due to bias is small (e.g., 15-month sensitivity means differ by .07, approximately 5% of 1 *SD*), but in other cases the attenuation is

larger (e.g., 36-month HOME scores differ by .84, 13% of 1 *SD*). These results suggest that future research focused on differences in parenting or child outcomes by maternal work schedules in particular, and parental work arrangements more broadly, need to fully account for the diverse and varied selection effects. The wide assortment of potential forces shaping selection into employment arrangements is rarely considered in studies of nonstandard work arrangements (cf. Han, 2008), thereby threatening the interpretability of observed associations. Propensity score techniques such as those used in this study offer one alternative for generating robust, unbiased estimates of the effects of employment on parenting and child development (Rosenbaum & Rubin, 1983).

Although our focus was on the potentially deleterious effects of nonstandard maternal work schedules, the comparatively poor parenting of nonworking women in this study is worth comment. Unadjusted analyses indicated that nonworking women had the lowest maternal sensitivity at 15 and 24 months, comparable sensitivity scores to those in full-time nonstandard work schedules at 36 months, and the lowest HOME scores at 15 and 36 months. This pattern persisted in propensity score-adjusted analyses, although maternal sensitivity at 36 months was lowest among women with a full-time nonstandard work arrangement (Table 2). These results are noteworthy for at least two reasons. First, the comparatively low parenting scores of nonworking women reinforce the conclusion that employment does not impair or interfere with women's parenting behavior (Bianchi, 2000), and it may, in fact, promote better parenting (Barnett & Hyde, 2001; Sieber, 1974). Second, the findings are noteworthy because the emergent differences in maternal sensitivity between nonworking mothers and those with a full-time nonstandard schedule job at 36 months reinforce the notion that early exposure to nonstandard schedules may be benign, but it may interfere with the creation of a foundation for maintaining sensitivity to infants' cues over time. Although the poor parenting practices among nonworking mothers is noteworthy, it should not distract attention from findings indicating that full-time nonstandard work schedules predict poorer parenting practices at 24 and 36 months among employed women.

### **Implications for Policy and Practice**

The results of this study suggest that maternal full-time employment in jobs requiring nonstandard work schedules may undermine developmentally generative parenting practices among working mothers. Although it is premature to move to policy recommendations until our findings are supported by further research, our results do suggest that tax credits that incentivize parenting education focused on sensitive responses to infant cues for women whose full-time job requires a nonstandard work schedule may be useful in systematically addressing the potential threat to parenting and children of anticipated growth in the 24/7 economy. Similarly, on a programmatic level, our results suggest the need for parenting education classes targeting mothers of infants who work nonstandard work schedules. Of course, the scheduling of these classes would need to accommodate the challenging work schedules of the targeted clientele.

Although our results contribute meaningfully to literature and have the potential to inform policy and programmatic assistance to families, they need to be interpreted in light of their limitations. Perhaps the greatest limitation is the absence of a direct measure of women's explanations for being in a job with a nonstandard schedule. Such a measure would, undoubtedly, improve the fit of the propensity score model, which would in turn, generate better predicted probabilities of being in a nonstandard schedule job and improved comparisons among groups of individuals. Next, the age of the data is a limitation. These analyses were conducted on data collected between 1991 and 1994, and it is possible that associations between nonstandard work schedules and parenting practices could have changed as the global economy created greater demand for jobs that operate 24/7. Although this is a legitimate concern, practically there have been no systematic attempts to address the work-family needs of individuals in the nonstandard schedule workforce. Thus, apart from greater prevalence of nonstandard work schedules in the contemporary economy, there is little reason to believe that associations of nonstandard work schedules with parenting practices would be systematically different today compared to the early 1990s. A third limitation is that we were not able to examine specific types of nonstandard work schedules and more specific types of parenting behaviors. It is possible that some nonstandard work schedules, perhaps fixed weekends or fixed evenings, may have relatively benign effects on parenting, whereas others, like fixed nights or rotating shifts, may exert a negative toll on parenting (Hsueh & Yoshikawa, 2007). Unfortunately, this study had neither sufficient measures nor sample size to explore this possibility. Furthermore, the generalizability of the results is not known because the NICHD SEEC was not designed to represent any specific cohort. Finally, we were unable to examine possible modifiers of the effects of the nonstandard work schedules. It is likely that some families, such as the economically disadvantaged, are more vulnerable to nonstandard work schedules (Joshi & Bogen, 2007; Strazdins, Korda, Lim, Broom, & D'Souza, 2004). Future research is needed to address these issues.

Limitations notwithstanding, the results of this contribute to the small but growing body of research examining the potential effects of nonstandard employment schedules on children. Using propensity score techniques to adjust for competing factors affecting selection into a job with a nonstandard schedule, our analysis found that women's full-time exposure to nonstandard work schedules during their child's first year of life had long-term negative implications for maternal sensitivity. Similar, albeit less consistent and robust evidence suggests that early exposure to full-time nonstandard schedule work may undermine the ability to provide a warm and stimulating environment. Although replication of these results is essential, especially given projections anticipating substantial growth in jobs requiring nonstandard schedules, the results of this study suggest that full-time employment in a job outside the more typical Monday-through-Friday, daytime schedule interferes with parents' ability to engage in and sustain developmentally generative parenting practices, particularly maternal sensitivity.

## **Note**

This research was supported by a grant from the *Eunice Kennedy Shriver* National Institute for Child Health and Human Development (HD050204).

## References

- Barnett, R. C., & Gareis, K. C. (2007). Shift work, parenting behaviors, and children's socioemotional well-being: A within-family study. *Journal of Family Issues*, **28**, 727–748.
- Barnett, R. C., & Hyde, J. S. (2001). Women, men, work, and family. An expansionist theory. *American Psychologist*, **56**, 781–796.
- Bell, R. Q., & Harper, L. V. (1977). *Child effects on adults*. Hillsdale, NJ: Erlbaum.
- Belsky, J. (1984). The determinants of parenting: A process model. *Child Development*, **55**, 83–96.
- Bianchi, S. M. (2000). Maternal employment and time with children: Dramatic change or surprising continuity? *Demography*, **37**, 401–414.
- Braiker, H., & Kelley, H. (1979). Conflict in the development of close relationships. In R. Burgess & T. Huston (Eds.), *Social exchange and developing relationships* (pp. 135–167). New York: Academic Press.
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.
- Bureau of Labor Statistics (2005). *Workers on flexible and shift schedules in 2004 summary*. Retrieved November 11, 2010, from <http://www.bls.gov/news.release/flex.nr0.htm>
- Caldwell, B. M., & Bradley, R. H. (1984). *Home observation for the measurement of the environment*. Little Rock: University of Arkansas.
- Coca-Perraillon, M. (2007). *Local and global optimal propensity score matching*. Retrieved November 11, 2010, from <http://www2.sas.com/proceedings/forum2007/185-2007.pdf>
- Conger, R. D., & Simons, R. L. (1997). Life-course contingencies in the development of adolescent antisocial behavior: A matching law approach. In T. P. Thornberry (Ed.), *Advances in criminological theory* (Vol. 7, pp. 55–99). New Brunswick, NJ: Transaction.
- Costa, P., & McCrae, R. (1985). *The NEO Personality Inventory manual*. Odessa, FL: Psychological Assessment Resources.
- Coulibaly, R., Séguin, L., Zunzunegui, M., & Gauvin, L. (2006). Links between maternal breastfeeding duration and Québec infants' health: A population-based study. Are the effects different for poor children? *Maternal and Child Health Journal*, **10**, 537–543.

- Crnic, K., & Low, C. (2002). Everyday stresses and parenting. In M. H. Bornstein (Ed.), *Handbook of parenting: Vol. 5. Practical issues in parenting* (pp. 243–267). Mahwah, NJ: Erlbaum.
- D'Agostino, R. B., Jr. (1998). Propensity score methods for bias reduction in the comparison of a treatment to a non-randomized control group. *Statistics in Medicine*, **17**, 2265–2281.
- Dallaire, D., & Weinraub, M. (2005). Predicting children's separation anxiety at age 6: The contributions of infant-mother attachment security, maternal sensitivity, and maternal separation anxiety. *Attachment and Human Development*, **7**, 393–408.
- Daniel, S. S., Grzywacz, J. G., Leerkes, E., Tucker, J., & Han, W. J. (2009). Nonstandard maternal work schedules during infancy: Implications for children's early behavior problems. *Infant Behavior and Development*, **32**, 195–207.
- Darling, N., & Steinberg, L. (1993). Parenting style as context: An integrative model. *Psychological Bulletin*, **113**, 487–496.
- Diaz, J. J., & Handa, S. (2006). An assessment of propensity score matching as a nonexperimental impact estimator. *Journal of Human Resources*, **41**, 319–345.
- Fagan, C. (2001). The temporal reorganization of employment and the household rhythm of work schedules: The implications for gender and class relations. *American Behavioral Scientist*, **44**, 1199–1212.
- Fagot, B. I., & Kavanaugh, K. (1993). Parenting during the second year: Effects of children's age, sex, and attachment classification. *Child Development*, **64**, 258–271.
- Fenwick, R., & Tausig, M. (2001). Scheduling stress: Family and health outcomes of shift work and schedule control. *American Behavioral Scientist*, **44**, 1179–1198.
- Greenberger, E., Goldberg, W. A., Crawford, T. J., & Granger, J. (1988). Beliefs about the consequences of maternal employment for children. *Psychology of Women Quarterly*, **12**, 35–59.
- Han, W. J. (2005). Maternal nonstandard work schedules and child cognitive outcomes. *Child Development*, **76**, 137–154.
- Han, W. J. (2008). Shift work and child behavioral outcomes. *Work, Employment and Society*, **22**, 67–87.
- Hattery, A. (2001). *Women, work, and family: Balancing and weaving*. Thousand Oaks, CA: Sage.
- Hecker, D. E. (2001). Occupational employment projections to 2010. *Monthly Labor Review*, **124**(11), 57–84.

- Heymann, S. J., & Earle, A. (2001). The impact of parental working conditions on school-age children: The case of evening work. *Community, Work & Family*, **4**, 305–325.
- Holden, G., & Miller, P. (1999). Enduring and different: A meta-analysis of the similarity in parents' child rearing. *Psychological Bulletin*, **125**, 223–254.
- Hsueh, J., & Yoshikawa, H. (2007). Working nonstandard schedules and variable shifts in low-income families: Associations with parental psychological well-being, family functioning, and child well-being. *Developmental Psychology*, **43**, 620–632.
- Hubbs-Tait, L., Culp, A., Culp, R., & Miller, C. (2002). Relation of maternal cognitive stimulation, emotional support, and intrusive behavior during Head Start to children's kindergarten cognitive abilities. *Child Development*, **73**, 110–131.
- Joshi, P., & Bogen, K. (2007). Nonstandard schedules and young children's behavioral outcomes among working low-income families. *Journal of Marriage and Family*, **69**, 139–156.
- Kalleberg, A. L., & Epstein, C. F. (2001). Introduction: Temporal dimensions of employment relations. *American Behavioral Scientist*, **44**, 1064–1075.
- Khaleque, A. (1999). Sleep deficiency and quality of life of shift workers. *Social Indicators Research*, **46**, 181–189.
- La Valle, I., Arthur, S., Millward, C., Scott, J., & Clayden, M. (2002). *Happy families? Atypical work and its influence on family life*. Bristol, UK: Policy Press.
- MacDermid, S. M., & Williams, M. L. (1997). A within-industry comparison of employed mothers' experiences in small and large workplaces. *Journal of Family Issues*, **18**, 545–566.
- Morrison, E. F., Rimm-Kauffman, S., & Pianta, R. C. (2003). A longitudinal study of mother-child interactions at school entry and social and academic outcomes in middle school. *Journal of School Psychology*, **41**, 185–200.
- NICHD Early Child Care Research Network. (1998). Early child care and self-control, compliance and problem behavior at twenty-four and thirty-six months. *Child Development*, **69**, 1145–1170.
- O'Neil, R., & Greenberger, E. (1994). Patterns of commitment to work and parenting: Implications for role strain. *Journal of Marriage and the Family*, **56**, 101–112.
- Parcel, T. L., & Menaghan, E. G. (1994). Early parental work, family social capital, and early childhood outcomes. *American Journal of Sociology*, **99**, 972–1009.
- Perry-Jenkins, M., Goldberg, A. E., Pierce, C. P., & Sayer, A. G. (2007). Shift work, role overload, and the transition to parenthood. *Journal of Marriage and Family*, **69**, 123–138.

- Perry-Jenkins, M., Repetti, R. L., & Crouter, A. C. (2000). Work and family in the 1990s. *Journal of Marriage and the Family*, **62**, 981–998.
- Pilcher, J. J., Lambert, B. J., & Huffcutt, A. I. (2000). Differential effects of permanent and rotating shifts on self-report sleep length: A meta-analytic review. *Sleep*, **23**, 155–163.
- Presser, H. B. (1995). Job, family, and gender: Determinants of nonstandard work schedules among employed Americans in 1991. *Demography*, **32**, 577–598.
- Presser, H. B. (2004). The economy that never sleeps. *Contexts: Understanding People in Their Social Worlds*, **3**, 42–49.
- Presser, H. B., & Hermsen, J. M. (1996). Gender differences in the determinants of work-related overnight travel among employed Americans. *Work and Occupations*, **23**, 87–115.
- Raviv, T., Kessenich, M., & Morrison, F. (2004). A mediational model of the association between socioeconomic status and three-year-old language abilities: The role of parenting factors. *Early Childhood Research Quarterly*, **19**, 528–547.
- Repetti, R. L., Matthews, K. A., & Waldron, I. (1989). Employment and women's health: Effects of paid employment on women's mental and physical health. *American Psychologist*, **44**, 1394–1401.
- Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies of causal effects. *Biometrika*, **70**, 41–55.
- Schaefer, E., & Edgerton, M. (1985). Parental and child correlates of parental modernity. In I. E. Sigel (Ed.), *Parental belief systems: The psychological consequences for children* (pp. 287–318). Hillsdale, NJ: Erlbaum.
- Seifer, R., & Dickstein, S. (2000). Parental mental illness and infant development. In C. Zeanah (Ed.), *Handbook of infant mental health* (2nd ed., pp. 145–160). New York: Guilford Press.
- Sieber, S. D. (1974). Toward a theory of role accumulation. *American Sociological Review*, **39**, 567–578.
- Smith, J. A., & Todd, P. E. (2001). Reconciling conflicting evidence on the performance of propensity score matching methods. *American Economics Review*, **91**, 112–118.
- Sroufe, L. A., Egeland, B., Carlson, E., & Collins, W. A. (2005). *The development of the person: The Minnesota study of risk and adaptation from birth to adulthood*. New York: Guilford Press.

- Strazdins, L., Clements, M. S., Korda, R. J., Broom, D. H., & D'Souza, R. M. (2006). Unsociable work? Nonstandard work schedules, family relationships, and children's well-being. *Journal of Marriage and Family*, **68**, 394–410.
- Strazdins, L., Korda, R. J., Lim, L. L., Broom, D. H., & D'Souza, R. M. (2004). Around-the-clock: Parent work schedules and children's well-being in a 24-h economy. *Social Science and Medicine*, **59**, 1517–1527.
- Susman-Stillman, A., Kalkose, M., Egeland, B., & Waldman, I. (1996). Infant temperament and maternal sensitivity as predictors of attachment security. *Infant Behavior and Development*, **19**, 33–47.
- Voydanoff, P. (2002). Linkages between the work-family interface and work, family, and individual outcomes. *Journal of Family Issues*, **23**, 138–164.
- Waldfogel, J., Han, W.-J., & Brooks-Gunn, J. (2002). The effects of early maternal employment on child cognitive development. *Demography*, **39**, 369–392.
- Zerubaval, E. (1985). *The seven day circle: The history and meaning of the week*. New York: Free Press.