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Nonmaternal Care's Association With Mother's Parenting Sensitivity: A Case of Self-Selection Bias?

Kei M. Nomaguchi and Alfred DeMaris*

Department of Sociology, Bowling Green State University, Bowling Green, OH 43403

Abstract

Although attachment theory posits that the use of nonmaternal care undermines quality of mothers' parenting, empirical evidence for this link is inconclusive. Using data from the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development ($N = 1,233$), the authors examined the associations between nonmaternal care characteristics and maternal sensitivity during the first 3 years of children's lives, with special attention to selection effects and moderation by resource levels. Findings from fixed-effects regression models suggested that, on average, there is little relationship between nonmaternal care characteristics and maternal sensitivity, once selection factors are held constant. Some evidence of moderation effects was found, however. Excellent-quality care is related to more sensitivity for mothers with lower family income. Poor-quality care is related to lower sensitivity for single mothers, but not partnered mothers. In sum, nonmaternal care characteristics do not seem to have as much influence on mothers' parenting as attachment theory claims.

Keywords

child care arrangements; fixed-effects models; marital status; parenting styles; selection effects; socioeconomic status

Between 1975 and 1998, the labor force participation rate among mothers with children under age 3 increased from 34.3% to 62.2%. Since the peak in 1998, there has been no clear trend (U.S. Department of Labor, Bureau of Labor Statistics, 2010). The increase in maternal employment during the first 3 years of children's lives has led to scientific and public debates about how early nonmaternal care might influence the mother – child relationship and the development of children (National Institute of Child Health and Human Development Early Child Care Research Network [NICHD ECCRN], 2005). Although most research has examined the direct link between nonmaternal care and child outcomes, some researchers speculate that the extensive use of nonmaternal care may result in poorer child outcomes in part indirectly through undermining mothers' sensitive parenting (Belsky, 1999; Brazelton, 1986). *Mothers' sensitive parenting* generally refers to the extent to which mothers respond to their children's needs promptly, remain patient with their children, provide adequate stimulation, and engage in playful interactions (Belsky, 1999). Given that mothers' sensitive parenting is a key factor in shaping child outcomes (NICHD ECCRN, 2001, 2003), this speculation is important to explore, yet relatively little is known about how nonmaternal care may influence the degree to which mothers exhibit sensitive parenting.

*Department of Sociology, Bowling Green State University, Bowling Green, OH 43403.

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Attachment theory has led to the popular premise that daily separations from their children due to the extensive use of nonmaternal care may result in less sensitivity in mothers' parenting (Belsky, 1999, 2001). Some researchers, however, have questioned the universality of this link, emphasizing variations by contexts of mothers' lives (Clark, Hyde, Essex, & Klein, 1997). Furthermore, other researchers are skeptical about nonmaternal care having much influence on mothers' parenting quality, suggesting the possibility of a selection effect; that is, maternal sensitivity and choices made concerning nonmaternal care might both be dependent on unobserved characteristics, such as mothers' child-rearing orientation (NICHD ECCRN, 1999).

The purpose of the present research was to address this debate. Using longitudinal data from NICHD Study of Early Child Care and Youth Development (SECCYD), we reexamined the association between nonmaternal care characteristics and maternal sensitivity. To address variations by context, we used a stress – resource perspective and examined mothers' resources, such as family income and marital status, as moderators of the association. To address the selection issue, we used fixed-effects models that control for unmeasured characteristics that could confound the observed association, and we compared the results with those from random-effects models. This study extends prior work in that it is one of the first studies to (a) explicitly use the stress – resource perspective in linking nonmaternal care to maternal sensitivity and (b) attempt to rule out self-selection bias.

Background

Prior Research

Attachment theory (Ainsworth, 1989) undergirds the premise that the use of nonmaternal care during the first 3 years of children's lives is related to poorer quality of mothers' parenting. It posits that extended hours of daily separations from their children may place constraints on mothers' ability to learn their children's subtle cues, which in turn results in a failure to provide sensitive parenting (Belsky, 1999, 2001). Although a few empirical studies have found a link between the amount of nonmaternal care and less sensitivity in mothers' parenting (Belsky, 1999; NICHD ECCRN, 1999), most studies have not. One study found that the amount of nonmaternal care was related to less sensitive parenting only for mothers with depressive symptoms and mothers whose child had a difficult temperament (Clark et al., 1997). A few studies found no relationships between the use or amount of nonmaternal care and maternal sensitivity (Booth, Clarke-Stewart, Vandell, McCartney, & Owen, 2002; Sifter, Coulehan, & Fish, 1993). In addition, several studies found that full-time use of nonmaternal care was related to more sensitive parenting of mothers (Burchinal, Bryant, Lee, & Ramey, 1992; Crockenberg & Litman, 1991; Schwartz, 1983), especially when the quality of care was high (Caruso, 1989; Edwards, Logue, Loehr, & Roth, 1986; Howes & Olenick, 1986).

These inconclusive findings may be attributable to methodological differences and limitations. First, most studies used a small, local sample. Some studies used samples of mothers whose children were in a particular type of care (e.g., high-quality center care; Edwards et al., 1986); other studies focused on middle-class families (e.g., Schwartz, 1983). The variations in sample characteristics indicate the possibility that the link between nonmaternal care and maternal sensitivity may depend on context. Second, most studies did not adequately control for characteristics that were related to both nonmaternal care characteristics and maternal sensitivity, such as mothers' parenting values, leaving the question of a selection effect unanswered.

Another limitation is overreliance on attachment theory. Because it heavily focuses on the negative influence of long hours of nonmaternal care, attachment theory pays little attention

to other effects that nonmaternal care may have on mothers' parenting, such as the positive effects of high-quality care found in prior research (e.g., Burchinal et al., 1992). Also, it ignores the possibility of variations in the influence of nonmaternal care on mothers' parenting that are due to context (e.g., Clark et al., 1997). An alternative perspective that expands the scope of the link between nonmaternal care and mothers' parenting is needed.

In this article, we address the conceptual and methodological issues in prior research by using a stress – resource perspective that provides a broader theoretical scope and by examining fixed-effects models that take into account unobserved characteristics. Below, we discuss how a stress – resource perspective predicts the association between nonmaternal care and mothers' sensitive parenting and how it further predicts the possibility of variations in the link by levels of mothers' resources. Then we address the issue of selection effects.

Nonmaternal Care as the Source of Resources and Strains

A stress – resource perspective is derived from structural and ecological perspectives that posit that parenting is largely influenced by the contexts in which parents and children are embedded (Bronfenbrenner, 1979; House, 1981). Belsky (1984) argued that such contexts are major sources of stress and support that influence parenting quality. As Pearlin's (1989) stress process model suggests, stress derived from the parental role leads to poorer mental health that can adversely affect one's ability to provide sensitive parenting. In contrast, resources associated with the parental role help mothers engage in more sensitive parenting. As we describe below, the type, amount, quality, and stability of nonmaternal care may be related to mothers' parenting either because they induce more stress or because they provide mothers with more parenting support.

The types of nonmaternal care commonly used for young children in the United States include father, relatives, family day care home, day care center, and in-home nonrelative care (Peyton, Jacobs, O'Brien, & Roy, 2001). Although father care, relative care, and family day care homes may reflect a close-knit support system for mothers, these types of care are more unstable than day care centers, which can be stressful for mothers (Gordon, Kaestner, & Rorenman, 2008; Maume & Mullin, 1993; Scott, London, & Hurst, 2005). Nanny care can help mothers by providing scheduling flexibility, but it can also be stressful because of ensuing mother – nanny tension over who is the better “mother” to the child (Macdonald, 2010).

Longer hours of nonmaternal care are generally a reflection of mothers' greater paid work demands (Glass, 1998). Longer employment hours are related to a greater sense of work – family conflict (Nomaguchi, 2009) which can curtail mothers' positive interactions with their children (Frone, Yardley, & Market, 1997). Some studies have found that more nonmaternal care hours were related to less sensitive parenting (Belsky, 1999; NICHD ECCRN, 1999). Other studies, however, have found no relationship between employment hours and maternal sensitivity (Booth et al., 2002; Huston & Aronson, 2005).

Quality of nonmaternal care, especially care providers' warmth and attentiveness to each child, is the number one concern that mothers have when choosing care for their children (Peyton et al., 2001). Mothers who were dissatisfied with the quality of care their children received showed poorer mental health (Greenberger & O'Neil, 1990; Jackson, 1997), which could undermine their sensitive parenting. In contrast, mothers whose children went to high-quality child care centers were more likely to provide sensitive parenting than stay-at-home mothers or mothers whose children went to low-quality day care centers (Edwards et al., 1986; Howes & Olenick, 1986), suggesting that high-quality care delivered by caregivers might serve as a role model of sensitive parenting for mothers. The link between better care

quality and more maternal sensitivity was also found by NICHD ECCRN (1999) for mothers with children who were in nonmaternal care more than 10 hours per week in the SECCYD.

Finally, instability of nonmaternal care creates daily hassles of finding an alternative arrangement or leads to missing work (Heymann, 2000; Scott et al., 2005). Some mothers use multiple arrangements to secure care providers, which increases their difficulty of working around various care providers' availability (Morrissey, 2008; Scott et al., 2005). Other mothers have to change care arrangements because of provider unavailability (Scott et al., 2005). Changing care arrangements requires that effort be expended on searching for potential providers and building a new relationship with the new care provider, which may lead to mothers' greater stress and less sensitive parenting.

Variations by Levels of Resources

The stress – resource approach further suggests that the extent to which individuals are vulnerable to stressful circumstances depends on the level of resources they can use to cope with the stress (Pearlin, 1989). This view indicates that nonmaternal care may be related to maternal sensitivity only for mothers with fewer resources. In support of this view, Belsky, Woodworth, and Crnic (1996) found that long hours of nonmaternal care were related to poorer parenting only among mothers with disadvantages measured on a scale of 10 characteristics such as child temperament, marital quality, and social support.

One type of resource that may be particularly salient is financial resources. Mothers with more family income may be less influenced by stress or support associated with nonmaternal care than mothers with less family income. With the same degree of reliance on nonmaternal care, mothers with more income are able to hire outside help for housework, which allows them to spend time with their children in a more focused manner. When a regular nonmaternal care arrangement fails, mothers with higher incomes can hire a substitute more easily. Modeling the parenting style of high-quality caregivers may occur only among mothers with lower socioeconomic status, because mothers with a higher socioeconomic status are unlikely to emulate their children's caregivers' approach because of social class differences in child-rearing styles (Macdonald, 2010).

Another relevant resource is marital status. A primary source of social support for U.S. adults is intimate partnership (McPherson, Smith-Lovin, & Brashears, 2006). Because single mothers lack a critical source of social support, both stress and support from nonmaternal care may be more salient for them than for partnered mothers (Colletta, 1981). Given that cohabiting couples tend to report less support from their partners than married couples (Brown & Booth, 1996), the parenting quality of cohabiting mothers may be more likely to be influenced, positively or negatively, by nonmaternal care characteristics than that of married mothers.

A Selection Effect

Some researchers are skeptical about nonmaternal care having much influence on mothers' parenting quality (Huston & Aronson, 2005; NICHD ECCRN, 1999). The central issue is selectivity. As ecological perspectives on parenting suggest (Belsky, 1984), characteristics of mothers, their children, the household, the neighborhood, and broader contexts may shape both mothers' choices concerning nonmaternal care and their sensitivity in parenting. Once all these characteristics are controlled, there may be little association between nonmaternal care characteristics and maternal sensitivity.

A number of mother characteristics may be related to both nonmaternal care and maternal sensitivity. Mothers who use nonmaternal care for longer hours are older, more educated, and more committed to paid work; they earn more, have fewer children, and have

progressive parenting values (Desai & Waite, 1991; Hynes & Clarkberg, 2005; NICHD ECCRN, 1997). Although older age, higher education, higher income, fewer children, and progressive parenting values are related to more sensitive parenting (Huston & Aronson, 2005; NICHD ECCRN, 1999), greater work commitment is related to more work – family conflict (Nomaguchi, 2009), which is related to less sensitive parenting (Frone et al., 1997). Mothers who use high-quality nonmaternal care have more family income and hold progressive parenting values (NICHD ECCRN, 1997), both of which are related to more sensitive parenting (Huston & Aronson, 2005; NICHD ECCRN, 1999). Characteristics of nonmaternal care as well as parenting styles differ across racial and ethnic groups (Hofferth, Brayfield, Deich, & Holcomb, 1991; Jackson-Newson, Buchanan, & McDonald, 2008). Mothers who are more playful about child care arrangements may be more likely to provide sensitive parenting and use stable, high-quality care (Gordon & Högnäs, 2006). For child factors, mothers' parenting tends to be more sensitive when the child is a girl, a first child, and has an easy temperament (Huston & Aronson, 2005; NICHD ECCRN, 1999), although less is known about how these child factors influence mothers' choices of nonmaternal care arrangements. Resources in the community, which comprise a factor in the broader context, are likely to affect the availability of high-quality nonmaternal care and mothers' parenting quality (Colletta, 1981).

Prior research that has properly controlled for characteristics that may be related to both nonmaternal care and maternal sensitivity is scarce. In fact, studies that have included all variables that need to be controlled are rare. It is possible that the link between the amount and quality of nonmaternal care and maternal sensitivity found in prior research (Belsky, 1999; NICHD ECCRN, 1999) may be spurious. What is needed is research that eliminates unmeasured characteristics, or *unobserved heterogeneity*, that lead to both mothers' making more favorable nonmaternal care arrangements and to mothers having greater maternal sensitivity. In this research, we used fixed-effects regression modeling to control for such unobserved heterogeneity. To the extent that a stable characteristic with a time-invariant effect is responsible for the link between nonmaternal care and maternal sensitivity, it can be controlled with this technique. Fixed-effects regression, however, cannot obviate confounding due to a time-varying characteristic or one with a time-varying effect on maternal sensitivity. Neither can it control for confounding due to reverse causation, in the event that it is actually maternal sensitivity that influences choices in nonmaternal care. Below we detail the strategy used in the current study.

The Present Study

Rather than posit conflicting formal hypotheses, we speculated on the findings anticipated by three different perspectives on the influence of nonmaternal care on mothers' sensitivity. We expected, that, if nonmaternal care reduces maternal sensitivity longer hours spent by children in nonmaternal care, lower quality of nonmaternal care, and instability of nonmaternal care are related to a lower level of maternal sensitivity. We also anticipated that, if the deleterious effect of nonmaternal care is limited to mothers with meager finances or lack of partner support longer hours spent by children in nonmaternal care, lower quality of nonmaternal care, and instability of nonmaternal care are related to a lower level of maternal sensitivity only for mothers with a lower level of family income and unmarried mothers. Last, we expected that, if any relationship between nonmaternal care and maternal sensitivity is driven solely by selection bias, nonmaternal care characteristics are unrelated to maternal sensitivity once observed and unobserved characteristics that are related to both nonmaternal care characteristics and maternal sensitivity are held constant. The observed characteristics that we controlled for included mother characteristics such as age, race or ethnicity, education, number of children, marital status, family income, work commitment, and parenting values, and child characteristics, such as sex, birth order, and temperament.

Method

Data

The data were drawn from the NICHD SECCYD, a longitudinal study of 1,364 children and their families. The study began in 1991 when families of newborns were recruited from 24 hospitals at 10 sites in nine states (for detailed information about the study design, see NICHD ECCRN, 1996, 2005). Of women who met the eligibility criteria for the study, 45% were enrolled. The present study used the information obtained when the child was 1 month (baseline), 6 months (Time 1 [T1]), 15 months (Time 2 [T2]), 24 months (Time 3 [T3]), and 36 months (Time 4 [T4]) of age. Data came from face-to-face interviews; self-administered surveys; and observations in home, laboratory, and child care settings. Among the 1,364 mothers, 1,234 mothers (90%) remained in the SECCYD by T4. One mother was dropped from the present analysis because of missing data on all variables used in fixed-effects models. The *N* for the analytical sample was 1,233. Heckman's (1979) test of attrition bias indicated that mothers' background characteristics in the baseline interview do not predict whether they were in the sample, with one exception: Mothers who dropped out of the sample tended to have more children in the household. It also suggested that there is little evidence that sample attrition biased the findings of the present analyses.

Measures

Maternal sensitivity—The indicator of *maternal sensitivity* was a scale based on observations of videotaped mother – child interactions in a semistructured age-appropriate play situation. Trained observers rated mothers' behaviors in several dimensions, such as sensitivity to distress, intrusiveness, detachment, stimulation of cognitive development, and positive or negative rewards for the child. The items and response categories for T4 were different from those for earlier times, because competent parenting differs by child's age. Thus, following the procedure used by prior research (Huston & Aronson, 2005; NICHD ECCRN, 1999), we created a composite of standardized scores from ratings on three items, including (a) sensitivity to nondistress, (b) intrusiveness (reverse coded), and (c) positive regard for T1, T2, and T3, and three items — (a) supportive presence, (b) hostility (reverse coded), and (c) respect for autonomy — for T4. Cronbach's alphas were .75, .71, .74, and .81 at T1, T2, T3, and T4, respectively. The alphas ranged from .63 to .83 for marital status subgroups and from .61 to .80 for family income subgroups (i.e., <25th percentile, 25th – 49th percentiles, 50th – 74th percentiles, and 75th+ percentile).

Nonmaternal care characteristics—Our analysis examined four nonmaternal care characteristics: (a) type, (b) amount, (c) quality, and (d) stability. These characteristics were measured at T1, T2, T3, and T4. When a mother used more than one nonmaternal care arrangement, we focused on characteristics of the primary arrangement in which the child spent the most time, following a procedure used in prior research (e.g., Gordon et al., 2008).

Type of care encompassed six categories, including (a) *maternal care only* (reference), (b) *father or partner*, (c) *relative in the child's or relative's home*, (d) *in-home care by a nonrelative* (i.e., a nanny), (e) *family day care home* (including other types of outside-home care by a nonrelative), and (f) *child care center*.

Amount of care was measured as the total hours children spent in all care arrangements per week. When mothers were taking care of their children full time, 0 hours were assigned. Because the stress – resource perspective suggests that amount of care may reflect hours of paid work, we examined the models using the measure of weekly hours of paid work, including or excluding hours worked at home, and found similar patterns of results.

Quality of care was measured by observation. For children spending at least 10 hr per week in nonmaternal care on a regular basis, observations of sensitivity, involvement, and stimulation provided by caregivers in nonmaternal care settings were conducted on two half-days, using the Observational Record of the Caregiving Environment checklist (NICHD ECCRN, 1996). The observations consisted of 44-min cycles, each broken into four 10-min observation periods. The Observational Record of the Caregiving Environment checklist comprises three kinds of ratings: (a) positive caregiving frequencies (i.e., behavioral scores), (b) positive caregiving ratings (i.e., observer evaluations), and (c) overall impressions of caregivers' behaviors at the end of the observation. Following prior research (NICHD ECCRN, 1999), we used the last rating, which we labeled *global child care quality*, measured by observers' rating of their overall impression of nonmaternal care (1 = "terrible," 2 = "poor," 3 = "fair," 4 = "good," and 5 = "excellent"). Because very few child care providers were rated as "terrible," we combined "terrible" with "poor." We created five categories: (a) *not in nonmaternal care*, (b) *poor*, (c) *fair*, (d) *good* (reference), and (e) *excellent*. Note that children who spent fewer than 10 hr per week in nonmaternal care had missing values. As we will discuss below, they were assigned imputed values.

Instability of care was measured with three indicators. *Multiple care arrangements* was a dummy variable indicating whether mothers reported more than one concurrent nonmaternal care arrangement; *missed work* was a dummy variable indicating whether, since the last interview (i.e., during the last 9 to 12 months), mothers or their spouses had missed work due to provider unavailability (e.g., provider sick, center closed); and *changes in arrangements* was a dummy variable indicating whether mothers had changed child care arrangements during the past 3 months because of provider unavailability.

Resources—*Family income* (T1, T2, T3, and T4) was a continuous variable that included mothers' and their spouse or partner's annual income from all jobs. *Marital status* (T1, T2, T3, and T4) was measured by three dummy variables, including *married* (reference), *cohabitation*, and *single* (including separated, divorced, widowed, and never married).

Controls—The number of children under age 18 in the household (T1, T2, T3, and T4) was a time-varying variable. Other controls were time-invariant factors measured during the baseline interview, except for child temperament, which was measured at T1. Mothers' age at birth was measured in years. Mothers' race or ethnicity was tapped by dummy variables including *White* (reference), *Black*, *Hispanic*, and *other race*. Mothers' education was captured with dummy variables including *less than high school*, *high school diploma*, *some college*, *college degree* (reference), and *advanced degree*. Child's gender was a dichotomous variable (1 = *girls*). Birth order also was a dichotomous variable (1 = *first child*). Child's difficult temperament was measured as the mean of 55 items ($\alpha = .81$; e.g., "My baby is fussy on waking up or going to sleep" [1 = *almost never* to 6 = *almost always*]). Progressive parenting values was the mean of eight items ($\alpha = .62$; e.g., "Children should be allowed to disagree with their parents if they feel their own ideas are better" [1 = *strongly disagree* to 5 = *strongly agree*]). Work commitment was a sum of six items ($\alpha = .75$; e.g., "I can't picture having a fully satisfying life without a career" [1 = *strongly disagree* to 6 = *strongly agree*]).

Statistical Models

We used both random- and fixed-effects regression modeling to examine the association between nonmaternal care characteristics and maternal sensitivity. A key question was whether some unobserved characteristics could be responsible for an observed association between nonmaternal care and maternal sensitivity. The first step was to examine whether, once the usual demographic controls were held constant, there was evidence of any such unobserved characteristic at work in the model. This was done by pooling the observations

from the four different time periods into one data set (hereinafter *the pooled data*, $N = 4,932$ person-years) and estimating the main model via ordinary least squares (OLS) regression. Serial correlation of errors for the same case across different times was a necessary condition for unobserved heterogeneity (Wooldridge, 2002); therefore, we began by testing for serially correlated errors, following the procedure outlined by Wooldridge (2002).

Given serial correlation, we estimated two types of models using the pooled data. Both presume an underlying equation that contains an extra effect, u_i :

$$Y_{ij} = \alpha_j + \beta X_{ij} + \gamma Z_i + u_i + e_{ij}, \quad (1)$$

where Y_{ij} is maternal sensitivity for the i th mother at time j ; X_{ij} is a vector of time-varying explanatory variables (e.g., nonmaternal care quality); Z_i is a vector of time-invariant factors (e.g., race/ethnicity); u_i is the unobserved effect, which may represent a self-selection factor; and e_{ij} is random error at each time point. The random-effects model assumes that u_i is uncorrelated with the regressors in the model (i.e., X_{ij} and Z_i), as well as with e_{ij} . Its presence only implies that there will be serial correlation of errors for the same case across time points in the data. Random-effects regression then estimates Equation 1 by removing the serial correlation (see Wooldridge, 2002, for the computational details).

The fixed-effects regression model, in contrast, assumes that u_i is correlated with the model regressors. Two other important assumptions are made about u_i : (a) It represents a characteristic of mothers that is unchanging over time, and (b) the effect of the characteristic on maternal sensitivity does not change over time. Its presence in Equation 1 leads to self-selection bias in the estimate for β if it is not eliminated. The manner in which it is eliminated is called *time demeaning*. It involves the estimation of an equation for the mean of Y_{ij} across time for each case; that is, one averages Equation 1 over the j time periods (where $j = 4$ in this study) for each case. The resulting equation for the averaged Y_{ij} is

$$\bar{Y}_i = \bar{\alpha} + \beta \bar{X}_i + \gamma Z_i + u_i + \bar{e}_i, \quad (2)$$

where, $\bar{Y}_i$, $\bar{\alpha}$, $\bar{X}_i$, Z_i , u_i , and $\bar{e}_i$ are the average values, over the j time periods for the i th case, of the terms in Equation 1 (because Z_i and u_i don't change over time, they are equal to their averages). Equation 2 is then subtracted from Equation 1, producing a new equation to be estimated:

$$Y_{ij} - \bar{Y}_i = (\alpha_j - \bar{\alpha}) + \beta(X_{ij} - \bar{X}_i) + (e_{ij} - \bar{e}_i). \quad (3)$$

This equation no longer contains an unobserved effect; it has been “differenced away.” It can then be estimated by OLS to produce an estimate of β that is unconfounded by u_i . We see that the time-invariant regressors in Z_i have also been differenced out of Equation 3. Thus, we cannot get estimates for them. Nevertheless, they are all controlled in the analysis. Notice that β in Equations 1 and 3 is the same coefficient vector. Hence, the fixed-effects technique is a “vehicle” for estimating the cross-sectional “effect” of X_{ij} on Y_{ij} while eliminating the unobserved selection effect. Importantly, that X_{ij} is causally antecedent to Y_{ij} must be justified on theoretical grounds, as we have done above.

For reliable estimation of the effects of the time-varying predictors, they must exhibit sufficient variability over time, within subjects. For this reason, we investigated the proportion of variability lying within versus between subjects for maternal sensitivity, as well as all within-subjects regressors in the study via a random-effects analysis of variance (Kutner, Nachtsheim, Neter, & Li, 2005). All such factors exhibited significant amounts of within-subject variability. Fifty-nine percent of the variability in maternal sensitivity is within subjects. Moreover, most of the nonmaternal-care factors showed the majority of

their variability to be within subjects. The exceptions were the amount of nonmaternal care (40.5% of variability within subjects) and family day home care (47.9% of variability within subjects). The variable having the least amount of within-subjects variability was number of children in the household (15.9% of variability within subjects), a control variable.

If u_i is uncorrelated with the model regressors, then both random-effects and fixed-effects coefficients should be about the same in large samples, but if u_i is correlated with one or more model regressors, then the effects from the two different approaches will diverge in large samples. In this case, the fixed-effects estimates will be consistent and the random-effects estimates will not. Therefore, a test of the equality of fixed- versus random-effects coefficients (Allison, 2009) allows us to evaluate whether the nonmaternal care – maternal sensitivity association is possibly driven by unobserved heterogeneity. Random-effects models were estimated via SAS's PROC MIXED program, and fixed-effects models were estimated with SAS's PROC GLM.

Missing Data

Most variables had relatively few missing data. For example, 4.5% of cases were missing on the outcome variable in the pooled data. A more marked missing-data problem emerged for nonmaternal child care quality, with up to 22% of cases missing data on this factor. Rather than employing listwise deletion, which is associated with larger standard errors and reduced power (Johnson & Young, 2011), we used multiple imputation to replace the missing values. Following Allison's (2009) recommendation, we replaced missing values on the outcome variable, as well as on the regressors. Five replicates of the data set were used to accomplish the procedure.

Sample Characteristics

Descriptive characteristics of the sample are presented in Table 1 for time-invariant variables and in Table 2 for time-varying variables. A few attributes are worthy of note. The average age of mothers at birth was 28.3 years, with a range of 18 to 46. Most mothers were White, with 81% falling into this racial group. Means for maternal sensitivity were 9.2, 9.4, and 9.4 for T1, T2, and T3, respectively (range: 3 – 12), and 17.2 for T4 (range: 3 – 21). These figures suggest that average maternal sensitivity was rather high. As mentioned earlier, these scales were converted into standardized scores for the analysis. In the pooled data, 29.2% used mother care, 12.9% used father care, 14.3% used relative care, 7.2% used nanny care, 19.3% used family day care in the home, and 17.0% used center care. The average amount of nonmaternal care was 25.1 hours per week. Distributions of quality of nonmaternal care were 6.8% poor, 20.0% fair, 29.9% good, 13.9% excellent, and 29.2% not applicable due to mother care. For three indicators of stability of nonmaternal care, 21.5% of mothers used multiple care arrangements, 5.7% of mothers involuntarily changed care arrangements because of unavailability of care providers, and 6.0% missed work because of unavailability of care providers.

Results

Addressing Selection Bias

We began by testing for serially correlated errors in the main effects regression model. The correlation was .32 and very significant ($p < .001$). This suggests the presence of an unobserved effect in the models. We then estimated both main effects and interaction models, as shown in Tables 3 and 4, using, alternately, random- versus fixed-effects specifications. The test recommended by Allison (2009) for assessing equality of effects across the random- and fixed-effects main effects models was highly significant ($F = 6.23$, $p < .001$). This suggests that the unobserved effect is correlated with one or more model

regressors and that the fixed-effects results are therefore to be preferred over the random-effects ones. To examine the extent to which results are confounded by unobserved heterogeneity, we discuss both the random- and fixed-effects models, in turn, in each table.

The results from the random-effects model (Model 1), and the results from the fixed-effects model (Model 2) for the association between nonmaternal care characteristics and maternal sensitivity, are presented in Table 3. We considered the random-effects model first. The model (Model 1) shows that the quality of nonmaternal care was related to maternal sensitivity. Mothers whose children were receiving poor- instead of good-quality nonmaternal care were significantly less sensitive in their parenting. Maternal sensitivity was greater for mothers with higher income levels but lower for cohabitators and single mothers, compared to married mothers. Blacks and “other” racial groups exhibited lower maternal sensitivity than Whites. Mothers with less education than a college degree showed lower maternal sensitivity than their degree-holding counterparts. Mothers with more progressive parenting values and those with lower work commitment were significantly more sensitive. Finally, mothers exhibited greater sensitivity toward girls than boys.

These results were, however, somewhat suspect. Random-effects coefficients are biased whenever the unobserved effect in the model is correlated with one or more model regressors, as was the case here. Thus, we reevaluated the above findings by comparing them with the effects in the fixed-effects model (Model 2). Here we found that the quality of nonmaternal care was not significantly related to maternal sensitivity. Maternal sensitivity was only marginally (at $p < .10$) higher for mothers with higher incomes. No other effects in the model attained significance at conventional levels. As explained above, the time-invariant factors of race through child’s difficult temperament, presented in the bottom half of Table 3, could not be included in the fixed-effects equation, but they were controlled nevertheless.

Variations by Resources

Another position concerning the association between nonmaternal characteristics and quality of mothers’ parenting is whether the links would be found only for mothers with fewer resources. We addressed this question by adding interaction effects between nonmaternal care characteristics and two types of resources (i.e., family income and marital status) on maternal sensitivity to the models. Models 1 and 2, in Table 4, present the results from random-effects and fixed-effects models, respectively. We considered the random-effects model first, focusing specifically on the added interaction effects. Three interaction effects were significant. First, increasing income appeared to dampen the effect of nonmaternal care quality on maternal sensitivity. The effect of excellent quality care, compared to that of good quality care, was: $0.446 - 0.006 \times \text{family income}$. This suggests that the positive effect of excellent quality on maternal sensitivity was diminished by 0.006 units for each additional \$1,000 of annual family income; specifically, the effect was 0.296 for those making \$25,000 — the 25th percentile in the income distribution in the current sample — but it was reduced to 0.206 for those making \$40,000 — the median income in the sample. The effect was further reduced to 0.056 for those making \$65,000, the 75th percentile in the income distribution, and was zero for those making \$73,400. These figures indicate that excellent quality of care was related to a higher level of maternal sensitivity for mothers with lower family income, but not for higher family income. Second, the negative effect of poor-quality nonmaternal care was exacerbated by being single. For single mothers, the effect was $-0.260 - 1.018 = -1.278$, compared to -0.260 for married mothers. Third, excellent-quality care appeared to have only marginal effects for married mothers, but it had a significantly more positive effect on maternal sensitivity for cohabiting mothers (i.e., $0.446 + 0.863 = 1.309$).

Again, an examination of the fixed-effects results provided a check on the robustness of these findings. The interactions involving quality of nonmaternal care and both income and single status were robust: The same substantive findings obtained in the fixed-effects results. In terms of effect size, the effects ranged from large to small in magnitude. The effect of poor quality of care, for single mothers, for example, was -1.785 (i.e., $-0.069 - 1.095$) compared to -0.069 for married mothers. Divided by the standard deviation of maternal sensitivity of 2.45, this translates into an effect size of -0.729 . This would be classified as a large effect by Cohen (1988). The maximum effect of excellent quality care occurs at the minimum income level of \$2,500 and is equal to $0.371 - 0.007(2.5) = 0.354$, for an effect size of 0.144. In Cohen's metric, this would be a small effect. The interaction between excellent quality care and cohabitation on maternal sensitivity found significant in the random-effects models received no confirmation in the fixed-effects equation.

Discussion

In the past few decades, there has been a debate over whether nonmaternal care is related to quality of mothers' parenting. Although attachment theory has led to the premise that the use of nonmaternal care undermines quality of mothers' parenting (Belsky, 1999), empirical research indicates several limitations of the theory. For example, some research suggests the possibility that the link between nonmaternal care and quality of mothers' parenting may exist only for mothers living in disadvantaged contexts (Clark et al., 1997). Other researchers suspected that self-selection might account for any association between nonmaternal care and maternal sensitivity (NICHD ECCRN, 1999). In this research, we used a stress – resource perspective to address the possibility of variations by context. In addition, to address the self-selection issue, we used longitudinal data that allowed us to control for observed as well as unobserved characteristics that may be influencing the association between nonmaternal care and mothers' parenting quality.

Our findings reinforce the importance of considering selection bias. Our test for serially correlated errors was significant, suggesting the presence of an unobserved effect in the models. When we compared the results between random-effects and fixed-effects regression models, we found that poorer quality care was related to lower maternal sensitivity in random-effects models, as previously found (NICHD ECCRN, 1999), but we did not find this association in the fixed-effects regression models. A statistical test indicated that fixed-effects regression models would provide more accurate estimates than the random-effects regression results. These results suggest that poorer quality nonmaternal care does not lead to lower maternal sensitivity; instead, some unobserved characteristic is very likely related to both the use of poorer quality care and less sensitive parenting. For the amount of nonmaternal care, we found no associations with maternal sensitivity in both random-effects and fixed-effects regression models. Our findings are at variance with prior work (Belsky, 1999; NICHD ECCRN, 1999) even in random-effects models, perhaps because we controlled for a wider range of mothers' characteristics, including work commitment and parenting values, than previous studies have. Finally, we found no associations between type or stability of nonmaternal care and maternal sensitivity, which is consistent with prior research findings (e.g., NICHD ECCRN, 1999). All in all, the first part of our analysis indicates that nonmaternal care characteristics play very little role in influencing quality of mothers' parenting on average.

The second part of our analysis indicates that there are some influences of nonmaternal care on mothers' sensitivity, but only for mothers with fewer resources. First, excellent quality of nonmaternal care is related to higher maternal sensitivity only for mothers with a lower level of family income. This pattern is consistent with other research findings that show high-quality nonmaternal care is beneficial for children from families with fewer resources

(Burchinal, Campbell, Bryant, Wasik, & Ramey, 1997; Dearng, McCartney, & Taylor, 2009; Watamura, Phillips, Morrissey, & McCartney, & Bub, 2011). Second, we found that poor nonmaternal care quality is related to lower maternal sensitivity for single mothers, but not for married or cohabiting mothers. This finding is consistent with the idea of “double jeopardy” of poor-quality nonmaternal care and fewer resources at home (Watamura et al., 2011). In sum, along with other research, our findings provide support for a notion based on the stress – resource perspective that mothers with fewer resources benefit more from resources within nonmaternal care, but they are also more vulnerable to stressful experiences derived from nonmaternal care. Because we found that only two of the many interaction effects we tested were significant, however, we conclude that empirical support for the third position is modest, at best.

Nevertheless, the evidence that resources condition the association between the quality of nonmaternal care and mothers’ parenting quality, although modest, may suggest policy implications. The availability of affordable, high-quality nonmaternal care for young children is limited (Heymann, 2000; NICHD ECCRN, 2005). Securing a nonmaternal care arrangement that meets their children’s needs (i.e., quality) and practical constraints (e.g., costs, location, and schedule) is not an easy task for mothers, especially when they have meager finances or lack partner support. They are more likely than their resourceful counterparts to end up compromising with a care arrangement that is of low quality (Heymann, 2000; Scott et al., 2005). Our findings, along with other research (e.g., Fuller, Kagan, Caspary, & Gauthier, 2002), suggest that more public efforts to increase the availability of affordable, high-quality nonmaternal care for single mothers and mothers with average or lower incomes may be warranted.

We did not find similar interaction effects between the amount of nonmaternal care and resource levels. One possibility is that although we focused on resources in the family domain (i.e., family income and marital status), resources in the work domain, such as scheduling flexibility or interpersonal relations in the workplace, may play a more important role in moderating the influence of the amount of nonmaternal care on mothers’ parenting quality (Gassman-Pines, 2011). This is an important area for future investigation.

We also did not find interaction effects between the stability of nonmaternal care and resources on maternal sensitivity. As some qualitative studies (e.g., Scott et al., 2005) have noted, having multiple care arrangements, changing care arrangements, and missing work because of the unavailability of a nonmaternal care provider may be especially difficult for mothers with fewer resources. Surprisingly, such sources of daily hassles do not seem to extend to more chronic stress that affects mothers’ quality of parenting. Research has shown that mothers who face multiple difficulties in securing child care tend to end up dropping out of the labor force (Heymann, 2000). It is possible that mothers tend to drop out of the labor force before the stressfulness of the instability of nonmaternal care begins to fully affect their parenting quality.

The present analysis has limitations that future research should address. First, fixed-effects regression modeling is unable to address unobserved heterogeneity that is either not stable over time or whose effect on the response changes over time, although there is not much that could be “driven” by this type of confounding because so few effects on maternal sensitivity were significant to begin with. In addition, fixed-effects models are somewhat inefficient because they discard variability in predictors that is between subjects. This would tend to reduce the power of tests of fixed-effects coefficients. To the extent that unobserved heterogeneity is driving predictor effects, fixed-effects coefficients are less likely to be contaminated by it than OLS or random-effects coefficients, however. Second, fixed-effects models, as well as random-effects models, do not address the issue of causality. Thus, the

causal direction could be the opposite. As other research has indicated (Howes & Stewart, 1987), it is possible that mothers who provide sensitive parenting tend to choose high-quality care; alternatively, mothers who are in stressful circumstances may be more likely to change nonmaternal care arrangements. It is possible that the moderation effects we found in the present analysis may mean that the influence of mothers' parenting sensitivity on the quality of nonmaternal care they use is greater for those who have fewer resources, perhaps because they have limited access to affordable, high-quality care. Third, the SECCYD was not a representative sample of U.S. mothers. Compared to families in census data, families in the SECCYD were more likely to be White and to have a higher level of education and household income, although they were also more likely to receive public assistance (NICHD ECCRN, 2005). Further work using a nationally representative sample is warranted.

The results of the present analysis suggest additional issues that should be investigated in future research. First, although we based our analysis on the stress – resource perspective, because of data limitations we were unable to examine the manner in which stress or support associated with nonmaternal care is related to maternal sensitivity. The SECCYD did not have information about daily hassles that mothers experienced or about mothers' sense of support from their child's care providers. Second, alternative measures of nonmaternal care characteristics could be more relevant to maternal sensitivity. For example, quality of nonmaternal care was measured on the basis of researchers' evaluations. It is possible that mothers' subjective evaluations of quality of nonmaternal care, which the SECCYD did not measure, may be more important in influencing their parenting than researchers' evaluations (e.g., Greenberger & O'Neil, 1990). Third, future research should investigate what might be the omitted variables that relate both to less maternal sensitivity and a poorer quality of nonmaternal care. Investigating such factors is important because mothers' sensitive parenting and high-quality nonmaternal care are both related to better child outcomes (NICHD ECCRN, 2001, 2003). Fourth, future research should examine whether mothers' parenting quality mediates the link between nonmaternal care and poorer child outcomes, the speculation that motivated the present analysis. Finally, although the present analysis conceptualized father care as a type of nonmaternal care, whether fathers should be classified as nonmaternal care providers is open to debate. Future research should examine possible implications of father care for mothers' well-being and parenting in a more nuanced way.

Past research on the association between nonmaternal care and quality of mother's parenting has heavily relied on attachment theory, ignoring possibilities of the influence of unobserved self-selection and variations by context. The present analysis suggests that ignoring selection characteristics that influence nonmaternal care may obscure scholars' understanding of the association between nonmaternal care and maternal sensitivity. Controlling for both observed and unobserved characteristics of mothers, the nonmaternal care characteristics we examined showed no main effects on maternal sensitivity. Instead, the present analysis provides some evidence that any effect of nonmaternal care quality may be conditioned by levels of resources. Excellent quality of nonmaternal care is related to higher maternal sensitivity for mothers with a lower level of family income, and poor quality of nonmaternal care is related to lower maternal sensitivity for single mothers. These results suggest that public efforts to provide affordable, high-quality care to help mothers with fewer resources maintain sensitive parenting could be valuable.

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Table 1 Means and Percentage Distributions for Time-Invariant Variables in the Analysis ($N = 1,233$)

Variable	<i>M</i> or %	<i>SD</i>	% Missing
Mother's age at birth (18 – 46; <i>M</i>)	28.3	5.6	0
Mother's race/ethnicity (%)			
White	80.9		0
Black	12.1		0
Hispanic	4.1		0
Other race	2.9		0
Mother's education (%)			
<High school	9.4		0
High school	20.7		0
Some college	33.1		0
College	21.6		0
Advanced degree	15.2		0
Mother's progressive parenting values (18 – 40; <i>M</i>)	32.8	3.5	0.8
Mother's work commitment (6 – 36; <i>M</i>)	21.2	5.9	0.6
Child's gender (1 = girls; %)	48.1		0
First child (%)	44.8		0
Child's difficult temperament (1 – 6; <i>M</i>)	3.2	0.4	1.9

Table 2 Means (*SDs*) and Percentage Distributions for Time Varying Variables in the Analysis

Variable	Individual waves				Pooled data	
	Time 1: 6 months	Time 2: 15 months	Time 3: 24 months	Time 4: 36 months	% Missing	
Maternal sensitivity ^a (<i>M</i>)	9.2 (1.8)	9.4 (1.6)	9.4 (1.8)	17.2 (2.8)		
Standardized maternal sensitivity ^b (<i>M</i>)	-0.04 (2.45)	-0.02 (2.40)	-0.04 (2.45)	-0.04 (2.58)	-0.03 (2.47)	4.5
Nonmaternal care characteristics:						
Type (%)						
Mother care	35.7	30.8	28.7	21.7	29.2	1.6
Father care	12.2	14.8	12.5	12.2	12.9	1.6
Relative care	17.6	14.8	13.2	11.7	14.3	1.6
Nanny care	7.4	8.1	7.1	6.2	7.2	1.6
Family daycare home	18.5	20.0	20.5	18.2	19.3	1.6
Center care	8.6	11.5	18.1	30.0	17.0	1.6
Amount (<i>M</i>)	22.2 (20.4)	24.8 (20.8)	26.0 (20.4)	27.5 (20.3)	25.1 (20.5)	1.8
Quality (%)						
Poor	3.5	5.2	8.0	10.6	6.8	22.0
Fair	14.0	20.5	20.6	25.0	20.0	22.0
Good	30.7	28.6	31.4	29.0	29.9	22.0
Excellent	16.0	14.9	11.3	13.6	13.9	22.0
Instability (%)						
Multiple care arrangements	16.5	20.7	22.2	26.6	21.5	1.6
Changes in arrangements	4.2	5.6	6.0	6.8	5.7	1.9
Missed work due to child care crisis	5.1	6.6	6.6	5.7	6.0	8.5
Resources						

Variable	Individual waves				Pooled data	
	Time 1: 6 months	Time 2: 15 months	Time 3: 24 months	Time 4: 36 months		% Missing
Family income in thousands (2.5 – 402; <i>M</i>)	48.8 (40.2)	49.3 (41.5)	51.5 (41.8)	53.0 (43.8)	50.6 (41.9)	3.5
Marital status (%)						
Married	77.5	76.6	76.6	75.6	76.6	3.6
Cohabiting	9.0	8.4	9.0	9.0	8.9	3.6
Single	13.5	14.9	14.4	15.4	14.6	3.6
Control						
Number of children (<i>M</i>)	1.9	1.9	2.0	2.1	2.0	2.6
	(1.0)	(1.0)	(1.1)	(1.0)	(1.0)	
<i>N</i>	1,233				4,932 person-years	

^a Ranges: 3 – 12 for 6, 15, and 24 months and 3 – 21 for 36 months.

^b Minimum = –13.14, maximum = 3.91.

Table 3

Regression Models Predicting the Associations Between Nonmaternal Care Characteristics and Maternal Sensitivity ($N = 4,932$ Person-Years)

Predictor	Model 1		Model 2	
	Random effects		Fixed effects	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Nonmaternal care characteristics				
Type ^a				
Father care	−0.060	0.138	−0.164	0.172
Relative care	−0.020	0.141	0.031	0.171
Nanny	0.022	0.173	−0.235	0.217
Family day care home	0.022	0.140	0.071	0.174
Center	0.042	0.143	−0.103	0.170
Amount	0.000	0.002	0.004	0.003
Quality ^a				
Poor	−0.327	0.148 *	−0.273	0.166
Fair	−0.001	0.110	0.019	0.126
Excellent	0.095	0.118	−0.024	0.125
Instability				
Multiple arrangements	0.121	0.085	0.020	0.106
Changes in arrangements	−0.008	0.130	0.082	0.140
Missed work due to provider unavailability	−0.051	0.139	−0.150	0.162
Resources				
Family income	0.004	0.001 ***	0.003	0.002 †
Marital status ^a				
Cohabiting	−0.505	0.149 ***	−0.390	0.262
Single	−0.450	0.126 ***	−0.083	0.238
Controls				
Number of children <18	−0.051	0.050	−0.016	0.085
Time ^a				
6 months	−0.011	0.085	−0.004	0.086
15 months	−0.004	0.086	0.012	0.085
24 months	0.005	0.085	−0.006	0.084
Mother's age at birth	0.016	0.010 †		
Mother's race/ethnicity ^a				
Black	−1.149	0.147 ***		
Hispanic	−0.140	0.208		
Other race	−0.780	0.245 **		

Predictor	Model 1		Model 2	
	Random effects		Fixed effects	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Mother's education ^a				
Less than high school	-1.745	0.196 ***		
High school diploma	-1.146	0.140 ***		
Some college	-0.524	0.118 ***		
Advanced degree	0.186	0.139		
Mother's progressive parenting values	0.053	0.012 ***		
Mother's work commitment	-0.020	0.008 **		
Girl	0.289	0.081 ***		
First child	-0.075	0.106		
Child's difficult temperament	-0.160	0.104		

^aOmitted reference categories are the following: mother care, good quality, married, 36 months, White, college graduate.

[†] $p < .10$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 4

Regression Models Examining Moderation Effects in the Associations Between Nonmaternal Care Characteristics and Maternal Sensitivity ($N = 4,932$ Person-Years)

Predictor	Model 1		Model 2	
	Random effects		Fixed effects	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Nonmaternal care characteristics				
Type ^a				
Father care	−0.135	0.142	−0.255	0.176
Relative care	−0.105	0.146	−0.066	0.176
Nanny	0.017	0.176	−0.285	0.219
Family day care home	−0.065	0.146	−0.025	0.180
Center	−0.025	0.147	−0.167	0.172
Amount	0.001	0.004	0.007	0.005
Quality ^a				
Poor	−0.260	0.344	−0.069	0.371
Fair	0.125	0.201	0.232	0.232
Excellent	0.446	0.223 [†]	0.371	0.255
Instability				
Multiple arrangements	0.216	0.168	0.108	0.200
Changes in arrangements	0.098	0.275	0.244	0.298
Missed work due to provider unavailability	0.285	0.261	0.154	0.309
Resources				
Family income	0.008	0.002 ^{***}	0.008	0.003 ^{**}
Marital status ^a				
Cohabiting	−0.676	0.212 ^{**}	−0.540	0.330
Single	−0.369	0.200 [†]	0.322	0.296
Controls				
Number of children <18	−0.053	0.050	−0.016	0.086
Time ^a				
6 months	−0.023	0.084	−0.011	0.086
15 months	−0.007	0.086	0.012	0.085
24 months	0.000	0.085	−0.010	0.084
Mother's age at birth	0.016	0.010		
Mother's race/ethnicity ^a				
Black	−1.122	0.148 ^{***}		
Hispanic	−0.156	0.208		
Other race	−0.776	0.246 ^{**}		

Predictor	Model 1		Model 2	
	Random effects		Fixed effects	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Mother's education ^a				
<High school	-1.703	0.197 ***		
High school diploma	-1.123	0.140 ***		
Some college	-.522	0.119 ***		
Advanced degree	0.197	0.140		
Mother's progressive parenting values	0.052	0.012 ***		
Mother's work commitment	-0.017	0.008 *		
Girl	0.288	0.081 ***		
First child	-0.066	0.106		
Child's difficult temperament	-0.155	0.104		
Nonmaternal care characteristics × income				
Amount × income	0.000	0.000	0.000	0.000
Poor quality × income	0.003	0.004	0.001	0.005
Fair quality × income	-0.002	0.003	-0.003	0.003
Excellent quality × income	-0.006	0.003 *	-0.007	0.003 *
Multiple arrangements × income	-0.001	0.002	-0.001	0.002
Changes in arrangements × income	-0.003	0.004	-0.003	0.004
Missed work × income	-0.003	0.003	-0.003	0.003
Nonmaternal care characteristics × marital status ^a				
Amount × cohabitation	0.002	0.007	0.002	0.008
Amount × single	0.008	0.006	-0.002	0.007
Poor quality × cohabitation	-0.022	0.501	-0.063	0.513
Poor quality × single	-1.018	0.458 *	-1.095	0.529 *
Fair quality × cohabitation	0.201	0.387	0.210	0.432
Fair quality × single	-0.259	0.300	-0.351	0.336
Excellent quality × cohabitation	0.863	0.430 *	0.766	0.484
Excellent quality × single	-0.218	0.464	-0.263	0.579
Multiple arrangements × cohabitation	-0.169	0.337	-0.263	0.381
Multiple arrangements × single	-0.273	0.292	-0.215	0.321
Changes in arrangements × cohabitation	0.722	0.418 †	0.695	0.439
Changes in arrangements × single	-0.503	0.463	-0.890	0.515 †
Missed work × cohabitation	-1.182	0.630 †	-1.024	0.663
Missed work × single	-0.513	0.446	-0.488	0.490

^aOmitted reference categories are the following: mother care, good quality, married, 36 months, White, college graduate, amount × married, poor quality × married, fair quality × married, excellent quality × married, multiple arrangements × married, changes in arrangements × married, and missed work × married

[†]
 $p < .10.$

^{*}
 $p < .05.$

^{**}
 $p < .01.$

^{***}
 $p < .001.$