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Early Mother-Child Separation, Parenting, and Child Well-Being in Early Head Start Families

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Abstract

Drawing on theories of attachment and family instability, this study examined associations between early mother-child separation and subsequent maternal parenting behaviors and children's outcomes in a sample of 2080 families who participated in the Early Head Start Research and Evaluation Project, the vast majority of whom were poor. Multiple regression models revealed that, controlling for baseline family and maternal characteristics and indicators of family instability, the occurrence of a mother-child separation of a week or longer within the first two years of life was related to higher levels of child negativity (at age 3) and aggression (at ages 3 and 5). The effect of separation on child aggression at age 5 was mediated by aggression at age 3, suggesting that the effects of separation on children's aggressive behavior are early and persistent.

Keywords

mother-child attachment; maternal parenting; child aggression; behavior problems; early separation

A central component of attachment theory is the notion that caregivers must be present and accessible in order for their children to become attached to them. Prior to developing a focus on individual differences in attachments throughout the lifespan, Bowlby was concerned with the well-being of children who experienced separations from their mothers (Kobak & Madsen, 2008). His early work demonstrated that separations as brief as one week in duration could negatively impact the quality of the relationship between mother and child (Bowlby, 1969/1982). Since this time, however, very little research has examined the impact of separations as a potential marker of disruptions in attachment relationships. The present study draws on the multi-site Early Head Start Research and Evaluation Project to examine the impact of early mother-child separation on both maternal parenting and subsequent child development.

The Attachment Theory Perspective on Mother-Child Separation

According to attachment theory, a secure attachment is derived from the child's appraisal of his/her mother's (or other attachment figure's) availability. Availability implies that the mother is physically accessible to the child. Bowlby referred to the lack of accessibility as either separation or loss, depending on whether it was temporary or permanent in nature (Bowlby, 1973). Whereas Bowlby stressed the importance of the mother's physical accessibility, Ainsworth clarified two other aspects of availability that are important for infant attachment. First, the child must develop a belief that the lines of communication with

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his/her mother are open, and second, the child must believe that his/her mother will respond if called upon for help (Ainsworth, 1990; Kobak & Madsen, 2008). As securely attached children get older, they are better able to tolerate physical distance from their mother because they may still be able to communicate with her and because they anticipate being comforted upon reunion. In the present study, we are primarily interested in links between physical accessibility, maternal responsiveness, and child outcomes. Specifically, we ask whether early disruptions in physical accessibility (mother-child separation during the first two years of life) are associated with maternal sensitivity and child socioemotional and language development.

We focus on separation between birth and age two because during that period children rely on physical proximity as the primary indicator of their mother's availability. Mothers who have left the home environment, even if available by phone, are perceived as unavailable. Maternal availability is particularly important within the first two years of life because of the infant's limited understanding of the reasons for maternal absence and the timing of her return. As a result, experiences of separation may be particularly salient. Even those as brief as a few hours in duration can result in distress. By the third or fourth year of life, the child increasingly understands that his or her mother has motives and plans of her own, and their relationship develops into a "goal-corrected partnership" (Bowlby, 1969/1982). Open lines of communication between mother and child thus allow the child to perceive continuity in their relationship despite brief absences. As a result, separation anxiety typically declines markedly (Kobak, Cassidy, Lyons-Ruth, & Ziv, 2006; Kobak & Madsen, 2008).

We focus here on mothers' sensitive and emotionally responsive parenting because these behaviors are consistently associated with a secure child-parent attachment (DeWolff & van IJzendoorn, 1997). Research on attachment interventions has also demonstrated the importance of responsive maternal behaviors in fostering a child's security and has shown that helping mothers to increase their responsiveness to their child can increase the child's attachment security (see Berlin, Zeanah, & Lieberman, 2008, for a review).

Previous research with clinical samples has indicated that early separation from caregivers can have adverse effects on children's well-being (Bowlby, 1969/1982, 1973; Rutter, 1987). In particular, children raised in institutions with little opportunity for interaction with warm and responsive adults have been found to show severe socioemotional development problems (Tizard & Hodges, 1978; Zeanah et al., 2005). Similarly, research on the effects of foster care has shown that maltreated children who are placed in foster care often exhibit higher levels of problem behaviors than children who were not removed from the care of their parents, particularly if the foster caregivers are unfamiliar to the child. The most commonly held explanation for these findings is that disruptions to the parent-child attachment are so unsettling to children, even those who were maltreated by their parents, that they result in negative socio-emotional outcomes ranging from mild to quite severe (Lawrence, Carlson, & Egeland, 2006).

Early separation has also been explicitly linked to insecure/disorganized attachment and subsequent mental health problems. In a study of French Canadian preschool children, those who experienced a shift from secure attachment to insecure/disorganized attachment were most likely to have experienced the loss of a parent or grandparent, or experienced parental hospitalization between assessments (Moss, Cyr, Bureau, Tarabulsy, & Dubois-Comtois, 2005). Furthermore, extended separations of a month or more prior to age 5 have been linked to increased symptoms of borderline personality disorder in adolescence and adulthood (Crawford, Cohen, Chen, Anglin, & Ehrensaft, 2009).

Other studies examining the impacts of more minor separations from caregivers have also found adverse consequences. For example, Leventhal and Brooks-Gunn (2000) found that any separation from a primary caregiver (defined as hospitalizations lasting one week or more, or a change of primary caregiver between assessment waves) was negatively associated with children's reading achievement by age 8. Although they found effects of separations that occurred at any point (until the child was age 8), separations that occurred within the first year of life were particularly salient for later achievement. Even normative separations, such as a child spending the day in child care, has been shown to be physiologically stressful for many children (Luecken & Lemery, 2004), though the stress of these separations can be buffered by responsive parenting prior to the separation and a sensitive alternative caregiver (Gunnar et al., 1992; Klein, Kraft, & Shohet, 2008).

Mother-Child Separation as a Disruption to the Family System

In addition to the implications that separations have for the child-mother attachment, separations may also be viewed as an indicator of family instability. A child who experiences a separation from his/her mother early in life may experience instability and chaos in other aspects of the home environment. Disorderliness, in terms of both family routines and the physical dimensions of a home (such as clutter, noise and crowding), is associated with both emotional distress and lower cognitive functioning among young children (for reviews see Brooks-Gunn, Johnson, & Leventhal, 2010; Evans, 2006). It appears that children in more predictable (i.e., regulated) environments are better able to self-regulate, which has positive implications for both socioemotional and academic competence (Evans, 2006). Within this context, an early-mother child separation may well be experienced as an unexpected disruption of normal family routine. It may also signal a household chronically subject to chaos.

Changes to the composition of a household also threaten the predictability of children's home environments, particularly when they cause separations between children and parents. The current literature on family stability illustrates associations between parent-child separations and negative outcomes for children and adolescents (Adam, 2004). For example, Adam and Chase-Lansdale (2002) examined the effect of family disruption, operationalized as parental separation or residential moves, on the adjustment of low-income adolescent girls. Parental separation was defined as residential separation from a parent or parent-figure, regardless of whether the parent or the adolescent moved out of the house. As hypothesized, a greater number of disruptions was positively related to adolescent adjustment problems. In particular, parental separation was related to earlier initiation of sexual intercourse and to educational and externalizing problems. In addition, although mother-child and father-child separation were both related to negative outcomes, the predictions from mother-child separation were particularly robust across multiple domains (Adam & Chase-Lansdale, 2002).

Other research has identified links between family instability and children's behavior problems. For example, Ackerman et al. (1999) found associations between family instability and externalizing behavior problems when indexing instability with a number of indicators, including changes in intimate parental relationships and residence changes. Furthermore, other research has found that instability – particularly in family structure – is more common among lower income and minority families (relative to higher income and White families; Ellwood & Jencks, 2004). Similarly, Morrissey (2009) has demonstrated that instability in terms of multiple child care arrangements has been linked to behavior problems, particularly for girls.

Unstable family environments have also been associated with less sensitive and responsive parenting and with negative child outcomes in several domains (Cavanagh & Huston, 2006;

Guzzo & Lee, 2008; Taylor, 2005). For example, Osborne and McLanahan (2007) found that poor-quality mothering mediated the link between instability (as defined by mother's number of romantic partner transitions) and children's internalizing and externalizing problems at age 3. Since many of the adverse outcomes associated with chaos and instability in the family system are associated with maternal low education, poverty, and minority race/ethnicity status, all of which predict suboptimal parenting and child outcomes, it is crucial that controls for family characteristics be included in analyses of family instability and parenting and child outcomes.

The Present Study

The present study builds on both attachment theory and work on family instability to address the role that early mother-child separation plays in predicting maternal parenting behaviors and children's developmental outcomes. Although attachment theory suggests that even temporary separation may affect later child outcomes, most research in this area has focused on permanent or otherwise traumatic separation (Lawrence et al., 2006; Tizard & Hodges, 1978; Zeanah et al., 2005). Even studies that have examined less traumatic separations have focused primarily on major separations such as those associated with parental moves (Adam & Chase-Lansdale, 2002) or extended hospitalizations (Leventhal & Brooks-Gunn, 2000). In the current study, we define early separation more broadly as *any* separation from the mother that lasted for one week or more and occurred within the child's first two years of life. Although it is quite likely that many of these separations occurred for innocuous reasons such as vacations or work-related travel, according to attachment theory (Bowlby, 1969/1982), a separation for as long as a week can result in distress for a young child who lacks the cognitive abilities to understand the continuity of maternal availability despite physical unavailability. Furthermore, a separation may serve as an indicator of other types of disruptions or instability within the family.

Based on the findings of previous research, we examined the effects of early separation on maternal parenting behaviors and children's outcomes in both socioemotional and cognitive domains. We tested four specific hypotheses. First, we expected that early mother-child separation would be related to maternal behaviors such that children who experienced separation would have mothers who were generally less sensitive and positive towards their children at age 3 than children who did not experience separation. Second, we expected that mother-child separation during the first two years of life would be negatively related to children's subsequent socioemotional and language development. Third, we anticipated that the effects of separation on children's development would persist such that effects observed at age 3 would still be evident at age 5. Fourth, we expected that early mother-child separation would covary with measures of family and household instability during the child's first two years of life. Because of insufficient prior research on which to base hypotheses, we did not predict whether associations between early separation and later parenting and child outcomes would be sustained in multivariate models that controlled for early instability. If associations between early separation and later parenting are sustained, even while controlling for family instability, it will suggest that separation is not merely a manifestation of early instability, but rather that it carries its own unique implications for parenting. If associations between early separation and later child outcomes are sustained, even while controlling for family instability, it will support the notion that disrupted attachments per se – rather than instability in general – are responsible for those associations.

Method

Sample and Procedures

The data are drawn from the Early Head Start Research and Evaluation Project, an ongoing evaluation of 17 Early Head Start (EHS) programs nationwide (see Love et al., 2002). All families seeking enrollment in the 17 programs between February 1996 and October 1998 were eligible for inclusion in the study. Families (N = 3,001), all of whom were low-income, were randomly assigned to the program and control groups; the former were offered EHS services and the latter were not. In the present study, the program and control groups are combined in all analyses. At baseline, approximately half the children were under 6 months old, while one quarter were over 6 months, and one quarter had not yet been born (i.e., the mother sought services prenatally).

Children were assessed in their homes as close as possible to the child's first, second, third, and fifth birthdays. At each time point, mothers were interviewed about their physical and mental health, employment and income, parenting strategies, household routines, and relationship with the child's father. Mothers also reported on their child's behavior, physical health, and developmental milestones. Children's cognitive ability and academic achievement were directly assessed by trained data collectors who were unaware of the family's program group assignment. Data collectors also made observations of the home environment, and all mother-child dyads were videotaped in a semi-structured play assessment. Interviews and assessments were conducted in Spanish for families whose primary language was Spanish. At the end of each visit, the mother was compensated for her time and the child was given a small gift. Mothers were also interviewed by telephone six, 15, and 26 months after study enrollment. Questions were primarily concerned with the family's use of child care and supportive services. At each point of contact, family demographic information was updated.

During the five years spanned by the project, the greatest attrition occurred in the first year following random assignment. At child age 1, 78% of the sample participated in the home assessment. At age 2, 72% of the sample participated; at age 3, 70% of the sample participated; and at age 5, 72% of the sample participated. These are fairly typical retention rates for studies of high-risk families with young children.

The present analytic sample includes all families with information on mother-child separation in the first two years of life and on either maternal parenting at child age 3 or child outcomes at age 5. Of the 3,001 families in the full sample, 2,080 (69%) met this criterion. Compared to mothers excluded from the analytic sample, those who were included were more likely to be White (39% versus 33%, $p < .05$) and to have had more education (54% of mothers had a high school diploma or GED at baseline, compared to 49% of mothers excluded from analysis, $p < .05$). Included mothers were more likely than excluded mothers to be living with a romantic partner (26% versus 22%, $p < .05$) and less likely to be the sole adult in their household (34% versus 41%, $p < .05$). They were slightly less likely to be primiparous (62% versus 66%, $p < .05$), and more likely to be in the program than control group (54% versus 42%, $p < .05$). In sum, within a generally disadvantaged sample (by design, given the families served by EHS), the families eligible for the present analysis were less disadvantaged. However, there were no differences between included and excluded families according to poverty status at baseline (89% were in poverty) or whether the mother was a teenager at the child's birth (39%). There were also no differences by child sex (51% male). Additional information regarding the demographic characteristics of the analytic sample can be found in Table 1.

Measures

Early mother-child separation—During the home assessments at child ages 1 and 2, mothers were asked if they had been separated from their child for a week or longer within the previous year. Children whose mothers who answered affirmatively at either time point were coded as having experienced a separation from their mother during the first 2 years of life (n = 335 [16%]).1 The presence or absence of a separation in the first 2 years was coded as 1 for at least 1 separation, and 0 for no separations. Because a child could have experienced a separation in the year prior to a wave in which he/she did not participate, our measure of separation is likely an undercount. However 86% participated at both ages 1 and 2. The most commonly reported reason for the separation at the age 1 home assessment was a vacation taken by the mother (19%), followed by the mother's visit to a relative (13%) or to the child's father or father figure (9%). At the age 2 home assessment, the most common reasons were the mother's visit to a relative (23%), mother's vacation (18%), and mother's visit to the father/father figure (13%). The separation was rarely due to the child being removed from the home by child protective services (6% at the age 1 and 3% at the age 2 assessment). Of those families who reported a separation, 37% did so by 14 months, an additional 47% reported a first separation by 24 months, and 16% reported separation at both 14 and 24 months. Even so, the correlation between age 1 and age 2 separation was modest (r = .19, p < .05).

Maternal parenting behaviors at child age 3—There are three measures of maternal parenting drawn from the home assessment at child age 3. Two measures came from the videotaped mother-child play activity. The protocol for this assessment was adapted from Vandell (1979) and the NICHD Study of Early Child Care's "Three Box" free play assessment (NICHD Early Child Care Research Network [ECCRN], 1999). The mother-child dyad was given three bags numbered 1 through 3 and instructed to go through the bags in order and play with their contents for the next 10 minutes. Instructions were intentionally vague in order to elicit naturally occurring parenting behaviors. The first bag contained a book, the second bag contained a play cash register and groceries, and the third bag contained blocks. Both the mother's and child's behavior were coded; maternal sensitivity and detachment, as well as child negativity were considered in the present analyses.

The coding scheme (Brady-Smith et al., 2000; Fuligni, Brooks-Gunn, & Brady-Smith, in press), also derived from that of the NICHD Study of Early Child Care (NICHD ECCRN, 1999) was based on attachment theory (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969/1982) and on research emphasizing the importance of parental scaffolding to children's early development (Rogoff, Mistry, Goncu, & Mosier, 1993; Vygotsky, 1978). Two scales of parenting behavior were used in the present analysis: sensitivity (responsivity, or the accurate perception of the child's signals and prompt and appropriate responses to these signals) and detachment (lack of engagement with the child). Both scales had seven points, ranging from very low (1) to very high (7). Sample means were 4.5 (SD = 1.0) for sensitivity and 1.2 (SD = 0.6) for detachment.

Videotapes were scored by the National Center for Children and Families (NCCF) at Teachers College, Columbia University. A doctoral student trained a team of coders and was the "gold standard" for all reliability tests. Coders were racially and ethnically diverse, and were randomly assigned to videotapes. Coders achieved reliability (exact agreement within one point) to a criterion of 85% with the gold standard, after which 15% of tapes were

[1]Several methods of devising the separation variable were explored, including continuous coding of the total number of separations experienced, and examining the timing of separation (prior to 1 year vs. prior to 2 years). Preliminary analyses revealed that no dosage or timing effects were present. Instead, a threshold of one separation was the relevant variable for our analyses, likely because most mothers whose child experienced a separation reported only one.

drawn randomly from the coders' weekly assignment and checked for interrater reliability (again at 85%). Coders' average agreement ranged from 86% to 100% across scales (Brady-Smith, Fauth, & Brooks-Gunn, 2005). All coders were unaware of identifying information about the videotaped families.

Also at the age 3 home assessment, data collectors administered the Home Observation for Measurement of the Environment (HOME) – Short Form, preschool version, from the National Longitudinal Survey of Youth (Caldwell & Bradley, 1984; Center for Human Resource Research, 2002). The HOME measures the quality of the home environment, and is completed by both interviewing the mother and by making observations throughout the home visit. The scale selected for the present analysis, Warmth, is purely observational. It is the sum of three binary items (0/1) indicating whether the mother kissed or caressed the child during the visit, whether her voice conveyed positive feeling towards the child, and whether she praised the child ($\alpha = .72$; Love et al., 2002). The mean in the present sample was 2.5 ($SD = 0.80$).

Child outcomes at ages 3 and 5—Aggressive behavior was measured using the Aggressive Behavior scale of the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2000). The CBCL includes items describing children's problem behaviors, and parents indicate how true each item is of their child using a 3-point scale (0 = not true to 2 = very true). Nineteen items were summed to create the Aggressive Behavior scale. Sample items include "destroys others' things" and "is uncooperative." At age 3, the sample mean was 11.1 (range = 0 – 37, $SD = 6.5$); at age 5 the sample mean was 10.9 (range = 0 – 38, $SD = 6.7$).

Children's negativity towards the mother was assessed during the videotaped mother-child play activity at ages 3 and 5. Children were scored on a 7-point scale (1 = very low, 7 = very high) according to the degree to which they expressed anger, hostility, or dislike towards their mother. At age 3, the sample mean was 1.3 ($SD = 0.6$) and at age 5, it was 1.2 ($SD = 0.6$).

During the home assessments at ages 3 and 5, children's receptive vocabulary was assessed with the Peabody Picture Vocabulary Test-III (Dunn & Dunn, 1997). This measure is age-standardized against national norming samples ($M = 100$, $SD = 15$). In the present sample, the mean of the PPVT-III was 83 ($SD = 16$) at age 3, and 92 ($SD = 15$) at age 5. Thus, the children considered here are up to one standard deviation below the national average, as would be expected from a disadvantaged sample.

Early household instability—There were five items indicative of household instability during the child's first 2 years of life, when early mother-child separation could have occurred: (a) whether the mother had another birth subsequent to the focus child by the 15-month phone interview (coded as rapid subsequent birth); (b) whether the mother experienced a change in marital status between the 6- and 15-month phone interviews; (c) the entry or exit of a cohabiting romantic partner between the 6- and 15-month phone interviews; (d) whether the child had multiple concurrent child care arrangements at either the 6- or 15–month phone interview; (e) and the mother's report at the age 1 home assessment of sleep routines for the child during the past week. The first four items were dichotomous, the last summed 3 items (regular bedtime, bedtime routine, and child always sleeps in same place).

Baseline demographic characteristics—A range of family socio-demographic characteristics were measured at baseline, prior to randomization into the program and control groups. These included maternal age, with the mother defined as a teenager at the

study child's birth if she was under 20 years of age at the time, and the mother's primary language (1 = English). Mother's race/ethnicity was self-reported, with Whites and Blacks both considered non-Hispanic. Mothers' education at baseline was dichotomized according to whether they had received a high school diploma or a GED. (Few mothers in this sample attended college.) Whether the family lived above the poverty line was calculated using the mother's report of the family income, her household size, and the federal poverty threshold. Mothers' living arrangements were categorized as living with a romantic partner, with another adult, or with no other adults. Child's sex and birth order were reported by the mother. For those mothers whose child had not been born yet, the child's sex was gathered via the 6-month phone interview. (See Table 1).

Results

Analytic Strategy

We first compared mother-child dyads who experienced a separation of a week or more in the first two years of life (i.e., had an early separation) to mother-child dyads who did not, according to characteristics of the family at baseline and indicators of household stability in the first two years. We next examined bivariate correlations among early separation, maternal parenting behaviors at child age 3, and child outcomes at ages 3 and 5. Then in separate models, parenting behaviors and child outcomes were regressed on early mother-child separation, controlling for baseline characteristics and household instability indicators. After identifying the child outcomes that were significantly predicted by early mother-child separation, we tested a mediated model in which age 3 outcomes mediated the association between early separation and children's behavior at age 5.

Baseline Characteristics Associated with Early Mother-Child Separation

Several characteristics at baseline distinguished the families of the children who experienced separation in the first 2 years of life from those who did not (see Table 1). Children with an early separation were more likely than children without one to have mothers who reported English as their primary language (88% versus 78%, $p < .001$), were less likely to be Hispanic (13% versus 25%, $p < .01$), and were more likely to be Black (41% versus 32%, $p < .01$). Children with and without an early separation did not differ according to maternal age, education, or poverty status at baseline.

Notably, the families of children with and without an early separation differed according to living arrangements at baseline. Specifically, mothers who went on to experience an early separation from their child were less likely than other mothers to live with a romantic partner (21% versus 28%, $p < .05$), though there were no significant differences in the proportions of mothers who lived either with no other adults or with another adult who was not a romantic partner. Children with and without an early separation did not differ according to child sex, whether or not they were first-born, or program group assignment (program versus control).

Associations between early mother-child separation and indicators of early household instability were mixed. Mothers who experienced a separation from their child were more likely to have had an additional birth by 15 months post-enrollment than mothers who did not experience an early separation (19% versus 14%, $p < .05$). Mothers with an early separation were also less likely to implement regular sleep routines for their children (95% vs. 97%, $p < .05$). Finally, there was a trend for mothers who experienced a separation from their child to be more likely to have had a change in marital status (11% versus 7%, $p < .10$). However, there were no differences between mothers who experienced a separation and

those who did not in terms of changes in cohabitation status, or in utilizing multiple caregiving arrangements.

Bivariate Associations between Early Mother-Child Separation and Later Parenting and Child Outcomes

Table 2 presents bivariate correlations among mother-child separation in the first 2 years of life, parenting behaviors at child age 3, and child outcomes at ages 3 and 5. Early mother-child separation was not associated with later parenting behaviors, but was related to child negativity (r =.06, $p < .05$) and aggression (r = .06, $p < .05$) at age 3, and to child aggression at age 5 (r = .06, $p < .05$). Separation was not associated with receptive vocabulary at either age 3 or 5. Correlations among maternal parenting behaviors at age 3 were small to moderate (|r|s of .12 to .44, p's < .001). Correlations among child outcomes ranged from small to large (|r|s of .01 to.60, p's < .01).

Multivariate Associations between Early Mother-Child Separation and Later Parenting Behaviors and Child Outcomes

Building on the findings of the bivariate analyses, a series of regression models was tested to examine the role of early separation in predicting later maternal parenting behaviors and child outcomes. First, early separation was used to predict the three maternal parenting behaviors measured at child age 3. Next, early separation was used to predict the three child outcomes measured at child ages 3 and 5. Last, a mediation model was tested based on the results from the previous two models. All models included maternal age, race, education, income, living arrangements, parity, child sex, program status, and the five indicators of household instability as controls. All multiple regression models were tested using Mplus software (Muthen & Muthen, 2001) and accounted for missing data with full information maximum likelihood (FIML) estimation, resulting in a consistent sample size (N = 2,080) across all analyses.

Table 3 presents the results of the first step in our analysis, in which maternal detachment, sensitivity, and warmth at child age 3 were regressed on early separation. None of these parenting behaviors was associated with early separation. Tables 4 and 5 present results of subsequent analyses, in which children's aggression, negativity toward parent, and receptive vocabulary at ages 3 and 5 were regressed on early separation. Consistent with bivariate analyses, there were significant associations between early separation and children's aggressive behaviors at age 3 (β= .06, $p < .05$) and age 5 (β= .05, $p < .05$). Children who experienced a separation from their mother within the first two years of life exhibited significantly higher levels of aggressive behaviors at ages 3 and 5 than children who had not experienced an early separation. Additionally, early separation was related to child negativity at age 3 (β= .05, $p < .05$), but not at age 5. Children who experienced an early separation were observed to be more negative toward their mothers during play at age 3, but this effect was no longer evident by age 5. Children's receptive vocabulary at age 3 or age 5 was not associated with having experienced an early separation.

Last, a mediation model was tested based on the previous sets of results. Because early mother-child separation was related to children's aggressive behaviors at both 3 and 5 years, we examined whether aggression at age 3 mediated the relationship between early separation and aggression at age 5. Following the steps outlined by Baron and Kenny (1986), it was first necessary to demonstrate that aggression at age 3 was related to both early separation and aggression at age 5. The significance of the first of these paths had already been demonstrated. It was also necessary that aggression at 3 years predict aggression at 5 years. This association was found to be large and significant, such that children who were rated as aggressive at age 3 were also likely to be aggressive at age 5

(β= .48, p < .001). Finally, when the association between early separation and aggression at age 5 was tested controlling for aggression at age 3, the coefficient for separation was no longer significant (β= .03, p = .22), suggesting that aggression at age 3 mediated the relationship between early separation and age 3 aggression at age 5. This finding was confirmed by a Sobel test, which indicated that age 3 aggression significantly mediated the relationship between early separation and aggression at age 5 (z = 2.51, p < .05).

Discussion

We tested the associations between early mother-child separation and nine outcomes. Three of these outcomes were significantly related to mother-child separation. In particular, we found associations between early mother-child separation and child negativity at 3 years, and child aggression at both 3 and 5 years. Early mother-child separation was not associated with maternal warmth, sensitivity or detachment, or with children's vocabulary skills.

These modest associations with early separation may be explained in part by the fact that the sample is extremely disadvantaged. Eighty-nine percent lived in poverty, 39% were teenage mothers, 46% lacked a high school diploma or GED, and 74% lived without a male partner at baseline. These characteristics serve individually and cumulatively as risks to early cognitive and socioemotional development (Sameroff, Seifer, Baldwin, & Baldwin, 1993; Smith, Brooks-Gunn, & Klebanov, 1997; Williams, Anderson, McGee, & Silva, 1990). They also predict home environments that are generally less warm, stimulating, and organized (Brooks-Gunn, Klebanov, & Liaw, 1995; Evans, Gonnella, Marcynyszyn, Gentile, & Salpekar, 2005; Menaghan & Parcel, 1991; Smith et al., 1997). If these families already experience disruption on a fairly regular basis, the additional experience of a week-long separation may not pose a significant threat, or shock, to the family system. Indeed, the indicators of family instability were themselves only mildly predictive of child outcomes. An important next step is to repeat the current analyses in a less at-risk sample. It is possible that in such a sample, larger effects on child aggression or negativity might emerge, or that effects on a greater number of parenting behaviors or child outcomes might emerge. In short, the overall risk level of the sample may factor into the extent to which early mother-child separation affects parenting and child development.

Given the context of relatively limited findings, our results still suggest that early separation has consequences for both children's aggression and negativity. For aggression, effects emerge by age 3 and persist at least through age 5. The effect of separation on child aggression at age 5 was identified as being mediated through elevated levels of aggression at age 3. These findings indicate that even a relatively brief separation within the first 2 years of life can have implications for child well-being three years later.

Despite the fact that physical proximity to primary caregivers is key to the formation of child-parent attachments, relatively little research has examined the effects of temporary separations on children's development. Previous research has focused on separations due to divorce (Amato & Keith, 1991), foster care (Lawrence et al., 2006), and parental moves (Adam & Chase-Lansdale, 2002), or more lengthy separations (Crawford et al., 2009; Moss et al., 2005), leaving unanswered questions about temporary and/or shorter separations that occur early in life. The present study shows that even brief separations can be associated with later behavior problems among children. Moreover, it does so using observed measures of maternal parenting and parent-child interaction, which are preferable to self-reported measures (Zaslow et al., 2006). Also, the use of a disadvantaged sample is noteworthy because it may be within this population that early separations are most likely to occur.

Finally, we proposed that both attachment theory and the literature on family instability and household chaos suggested the adverse effects of early maternal-child separation. Bowlby believed that early separations interrupt the development of the attachment of a child to her mother. Although his original work focused on the dire consequences for children who were raised in institutions with very little human interaction, he also emphasized that less severe negative outcomes were associated with more brief and relatively minor separations that occurred while the attachment system was still being developed (Kobak & Madsen, 2008). Regardless of cause, Bowlby observed that separations from the mother were generally associated with infant distress and feelings of loss that could be manifested in later child behaviors (Bowlby, 1969, 1973).

Alternatively, or in addition, early mother-child separation might disrupt family routines, thus upsetting the predictability and security of the child's home environment (Adam & Chase-Lansdale, 2002; Morrissey, 2009). Although we were unable to formally test this hypothesis, we probed available data on household composition and routines for associations with early mother-child separation. Of five indicators of family instability in the first two years of the child's life (change in mother's marital status, entrance or exit of a cohabiting partner, mother's rapid subsequent birth, multiple concurrent child care arrangements for the child, and the child's adherence to sleep routines), three were associated with early mother-child separation (change in marital status, rapid subsequent birth, and sleep routines). Despite this, bivariate associations between early separation and child aggression and negativity persisted in a multivariate model controlling for all five indicators of family instability. Thus it appears that in this sample, early separation was not merely a manifestation of family instability. Further, the causal mechanisms which link early separation to subsequent child behavior problems may well correspond to the unique pathways predicted by attachment theory.

It appeared that culture and language may have played a more significant role than family instability in predicting who did and did not experience a separation. Notably, Hispanic mothers and non-English speaking mothers were less likely to report a separation than their counterparts. In contrast, Black mothers made up 41% of those reporting separation although they constituted only 33% of the total sample. Further research is needed to explore the racial and cultural correlates of early mother-child separation.

Early Mother-Child Separation, Maternal Parenting, and Children's Outcomes

We find no association between early separation and maternal warmth, sensitivity, or detachment. Although these aspects of parenting (particularly sensitivity) is linked to the development of secure mother-infant attachment (DeWolff & van IJzendoorn, 1997; Friedman & Boyle, 2008), it does not appear that the experience of an early separation in any way is reflected in these aspects of maternal parenting. Indeed, the effect of early separation was manifested most clearly in children's early behavioral problems.

Our findings suggest an association between the experience of an early separation and later child aggression and negativity. This is consistent with previous research that has identified socioemotional consequences associated with a disrupted attachment (Adam & Chase-Lansdale, 2002; Lawrence et al., 2006). Similarly, it has been shown that anger is a common response in the Strange Situation assessment of infant-parent attachment (Shiller, Izard, & Hembree, 1986). If early separation is associated with anger, it is not surprising that children would demonstrate elevated aggressive behaviors as a result. We did not find evidence that separation predicted receptive vocabulary at ages 3 and 5. In contrast, Leventhal and Brooks-Gunn (2000) found that separation from a primary caregiver in the first eight years of life was negatively associated with reading and math achievement in middle childhood. It is possible that associations with cognitive outcomes would be evident in the present sample

later in the child's development, that separation impairs academic achievement more than language development, or that we would need to capture separation over a longer period of time to observe any associations with cognitive outcomes in our sample.

The degree to which a separation affects child outcomes likely depends on the reason for the separation. If separations are voluntary, mothers may be able to take preparatory steps to minimize the effects on her child. For example, with proper time and planning, mothers can select an alternate caregiver with whom the child has an established relationship, make arrangements to ensure that the child's routine is maintained in her absence, and ensure that other familiar figures such as relatives and neighbors are in contact with the child. In our sample, the separations appear to have been largely voluntary, since the primary reasons reported were mothers' visits or vacations as opposed to emergencies such as the illness of the mother, child or other family member. The relatively minor effects of separation in our sample may be due to the relatively non-urgent causes of the separation.

Another factor likely to influence the separation's effect on the child is the identity of the alternate caregiver and whether the child changes residences during the separation. A scenario in which a child stays at home and is cared for by a father or grandparent who already coresides with the child is qualitatively different from one in which the child is brought to an unfamiliar caregiver. Unfortunately, in the present sample we cannot determine whether children were cared for by an existing caregiver during the separation. However, at the age 1 home visit, mothers were asked about the person with whom the child stayed during the separation. Thirty-eight percent of mothers reported it was the maternal grandparent, 30% of mothers reported that it was the other parent, and the remainder consisted largely of other relatives. Fewer than 10% of children stayed in a hospital, foster home, or other institution. This may account for the relatively benign effects of separation in this sample. Future research examining the effects of early maternal-child separation must account for the familiarity of the environment and quality of the relationship between the child and his/her alternate caregiver during the separation.

Limitations and Caveats

As previously mentioned, the reason for the separation, where the child stayed, and who provided care are all potentially informative for helping to understand the effects of separation on parents and children. A maternal separation is quite likely not as distressing to an infant if he/she is left in the care of another attachment figure to whom he/she is securely attached. The present study was limited by its lack of information on caregiving arrangements during the separation. Another important contextual factor for which we did not account is the quality of care that the child receives during the separation, which can greatly alter how stressful the separation is for the infant. Gunnar et al. (1992) found that infants who received continuous, responsive, and individualized care during a 30 minute separation were much less stressed by the situation than children who were merely comforted and then left to play independently. It is quite likely that the quality of the care and the responsiveness of the alternate caregiver predicts much of the variability in how children respond to separations. Future research should address whether contextual factors associated with early separations can ameliorate the adverse effects of disrupted maternal physical availability. Many of these same issues are also under consideration in the literature addressing attachment and child care (Aviezer & Sagi-Schwartz, 2008; Vermeer, & Bakermans-Kranenburg, 2008).

The present study was also limited with respect to speaking to the causal association between early separation and children's behavior problems. Although we controlled for family characteristics, as well as indices of family instability that may have been correlated with separation, there are other characteristics that future research should examine in order

to strengthen the causal interpretation about the role of separation in predicting children's behavior. In particular, because parenting is a transactional process, it is possible that infant characteristics, such as temperament, may have predicted the occurrence of a separation or the child's behavior at ages 3 and 5 and/or moderated the effects of early separation on later outcomes. Similarly, future research could examine maternal personality characteristics or emotional well-being during the prenatal period to determine whether such variables may be related to both separation and children's behavior problems.

Future research should also explore how the experience of an early separation varies according to the security of the mother-child attachment. Such information was not available in the present study. Children who are not securely attached to their mother may find it particularly difficult to adjust to an alternate caregiver, regardless of the quality of the care received. At the same time, even securely attached children may be seriously distressed by a separation if it is experienced as a disruption in the mother-child relationship. Further research is needed to better understand how a child's attachment to his/her primary caregiver influences how the child reacts to alternate caregivers. In addition, further study is needed on how the experience and context of early mother-child separations shape children's developing attachments, both to the mother and to other caregivers.

While it is known that traumatic or extended separations can negatively impact children's development, the present study suggests that even relatively minor separations of a week or more that occur within the first two years of life are not entirely without adverse consequences for children's development. Although more information is certainly required about the physical and emotional contexts that might buffer the effects of separations on children's development, it is clear that a mother's physical accessibility during the first years of life has important implications for supporting positive child development.

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Table 1

Baseline Demographic Characteristics

	Total N = 2,080	Ever Separated n = 334	Not Separated n = 1,746
Mother teen at child's birth	39%	41%	38%
Mother's primary language is English	79%	88% ***	78%
Mother has high school diploma or GED	54%	53%	54%
Mother race/ethnicity:			
White, non-Hispanic	39%	41%	39%
Black, non-Hispanic	33%	41% **	32%
Hispanic	23%	13% ***	25%
Other	4%	5%	4%
Mother's living arrangements:			
Lives with partner	26%	21% *	28%
Lives with other adults	40%	43% ***	39%
Lives with no other adults	34%	37% ***	34%
Child is first-born	62%	65% ***	61%
Family above the poverty line	11%	12% *	11%
Child is male	51%	52%	51%
Family assigned to program group	54%	53%	54%
Rapid subsequent birth	15%	19% *	14%
Change in marital status	8%	11% +	7%
Change in cohabitation status	15%	15%	15%
Multiple child care arrangements by 15mo.	42%	43%	42%
Child has sleep routines	97%	97%	95%

Note: two-tailed tests of group differences.

+ $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

Table 2

Correlations among Early Mother-Child Separation, Parenting at Age 3, and Child Outcomes at Ages 3 and 5

	1	2	3	4	5	6	7	8	9
1. Early Separation	1.0								
2. Maternal sensitivity, age 3	-.01	1.0							
3. Maternal detachment, age 3	-.02	-.44***	1.0						
4. Maternal warmth, age 3	-.04	.30***	-.17***	1.0					
5. Child receptive vocabulary, age 3	.01	.22***	-.12***	.20***	1.0				
6. Child aggression, age 3	.06*	-.07**	.02	-.12***	-.09***	1.0			
7. Child negativity, age 3	.06*	-.33***	.11***	-.13***	-.12***	.10***	1.0		
8. Child receptive vocabulary, age 5	-.01	.30***	-.13***	.20***	.59***	-.08*	-.14***	1.0	
9. Child aggression, age 5	.06*	-.08**	.01	-.10***	-.05	.51***	.11**	-.09**	1.0
10. Child negativity, age 5	-.00	-.07*	-.01	.00	-.03	.06	.18***	.01	.11***

Note: Because the indicator of early separation is dichotomous, its correlations with all parenting behaviors and child outcomes, which are continuously measured, are point-biserial correlations, whereas all others in the table are Pearson correlations. All may be interpreted similarly.

* $p < .05$

** $p < .01$

*** $p < .001$

Table 3

Effects of Early Mother-Child Separation on Maternal Parenting Behaviors at Age 3

	Detachment			Sensitivity			Warmth		
	B	***SE B***	***β***	***B***	***SE B***	***β***	***B***	***SE B***	***β***
Early Separation	-.04	.04	-.02	-.03	.07	-.01	-.04	.05	-.02
Child is male	-.00	.03	-.00	.00	.05	.00	-.01	.04	-.01
Teen mother	.07	.04	.06^{+}	-.07	.07	-.03	.02	.05	.01
Primary language is English	-.01	.06	-.01	.18	.10	.07*	-.20	.08	-.10*
Completed high school/GED	-.13	.04	-.11***	.40	.06	.18***	.22	.05	.13***
Black	.11	.04	.09**	-.46	.07	-.21***	-.14	.05	-.08***
Hispanic	.00	.06	.00	-.09	.10	-.04	-.03	.08	-.02
Other ethnicity	-.10	.08	-.04	.11	.14	.02	.10	.10	.03
Living with other adults	-.01	.04	-.01	-.07	.07	-.03	-.25	.06	-.15***
Living with no other adults	.00	.04	.00	-.08	.07	-.04	-.07	.06	-.04
First-born	-.02	.03	-.02	.04	.06	.02	.06	.04	.04
Above poverty line	-.03	.05	-.02	.03	.08	.01	.07	.06	.03
Program group	-.04	.03	-.03	.11	.05	.05*	.06	.04	.04
Rapid subsequent birth	.12	.05	.07*	-.02	.08	-.01	-.20	.06	-.08**
Change in marital status	-.08	.06	-.04	.04	.11	.01	.01	.09	.00
Change in cohabitation status	.04	.05	.03	-.07	.08	-.02	.03	.07	.01
Multiple child care arrangements	-.03	.03	-.02	.02	.06	.01	.01	.04	.00
Child has sleep routines	-.01	.02	-.01	.02	.03	.02	.05	.02	.06*
R^2		.04			.11			.08	

Note: All variables were entered simultaneously for each model.

$^{+}p < .10$

$^{*}p < .05$

$^{**}p < .01$

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

Table 4

Effects of Early Mother-Child Separation on Children's Development at Age 3

	Aggression			Negativity			Receptive Vocabulary		
	B	***SE B***	***β***	***B***	***SE B***	***β***	***B***	***SE B***	***β***
Early separation	1.03	.41	.06*	.08	.04	.05*	.53	1.07	.01
Child is male	1.17	.30	.09***	.05	.03	.04+	-2.77	.79	-.09 ***
Teen mother	-.17	.39	-.01	-.05	.04	-.04	-.58	1.04	-.02
Primary language is English	.11	.58	.01	-.00	.06	-.00	2.29	1.62	.06
Completed high school/GED	-.00	.37	.00	.05	.03	-.04	4.52	.96	.14 ***
Black	-1.28	.39	-.09**	.03	.04	.02	-6.55	.97	-.20 ***
Hispanic	-.94	.58	-.06	-.03	.05	-.02	-6.92	1.49	-.19 ***
Other ethnicity	-2.46	.77	-.08**	-.04	.08	-.01	-.31	2.07	-.00
Living w/ other adults	.22	.44	.02	.07	.04	.06	-1.26	1.23	-.04
Living w/ no other adults	.52	.42	.04	.04	.04	.04	-.34	1.16	-.01
First-born	-.186	.34	-.01	.08	.03	.07*	.65	.92	.02
Above poverty line	-.66	.47	-.03	.09	.05	.05+	.11	1.31	.00
Program group	-.43	.30	-.03	-.07	.03	-.06*	1.21	.80	.04
Rapid subsequent birth	.02	.49	.00	-.03	.05	-.02	-.78	1.3	-.02
Change in marital status	-.34	.65	-.01	-.03	.06	-.02	.23	1.7	.00
Change in cohabitation status	.88	.50	.05+	-.00	.05	-.00	-3.83	1.36	-.09 **
Multiple child care arrangements	-.02	.33	-.00	-.04	.03	-.03	1.71	.87	.05 *
Child has sleep routines	-.17	.19	-.02	.03	.02	.05+	.49	.50	.03
R^2		.03			.02			.13	

Note: All variables were entered simultaneously for each model.

+ $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$

Table 5

Effects of Early Mother-Child Separation on Children's Development at Age 5

	Aggression			Negativity			Receptive Vocabulary		
	B	***SE B***	***β***	***B***	***SE B***	***β***	***B***	***SE B***	***B***
Early separation	.91	.44	.05*	-.02	.04	-.01	-.15	1.03	-.00
Child is male	1.48	.32	.11***	.06	.03	.05+	-1.99	.77	-.06*
Teen mother	-.45	.41	-.03	-.06	.04	-.05	-1.06	.99	-.03
Primary language is English	.24	.63	.01	-.10	.06	-.07+	4.62	1.56	.12**
Completed high school/GED	-.43	.39	-.03	-.01	.04	-.01	5.12	.94	.17***
Black	-3.06	.42	-.21***	-.06	.04	-.05	-8.76	.96	-.27***
Hispanic	-2.23	.62	-.14***	-.17	.06	-.13**	-3.09	1.47	-.08*
Other ethnicity	-1.31	.85	-.04	-.09	.08	-.03	-1.52	2.04	-.02
Living w/ other adults	1.49	.47	.11**	.08	.04	.07+	-1.77	1.16	-.06
Living w/ no other adults	1.43	.45	.10**	.05	.04	.04	-3.02	1.13	-.09**
First-born	-.43	.37	-.03	.07	.03	.06*	2.10	.89	.07*
Above poverty line	.19	.52	.01	-.08	.05	-.05+	1.64	1.25	.03
Program group	-.11	.33	-.01	-.03	.03	-.03	-.02	.79	-.00
Rapid subsequent birth	.05	.52	.00	-.01	.05	-.01	1.02	1.25	.02
Change in marital status	-.79	.66	-.03	-.06	.06	-.03	2.22	1.62	.04
Change in cohabitation status	.159	.53	-.01	-.07	.05	-.04	-2.47	1.27	-.06+
Multiple child care arrangements	-.30	.35	.02	-.03	.03	-.02	.97	.84	.03
Child has sleep routines	-1.03	.20	-.13***	.02	.02	.03	1.17	.48	.07*
R^2		.07			.02			.16	

Note: All variables were entered simultaneously for each model.

+ $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$