The Effects of Domestic Violence on the Stability of Attachment from Infancy to Preschool

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ABSTRACT

We hypothesized that trajectories of domestic violence (DV), maternal depression, and household income (from pregnancy to age 4) would be differentially associated with instability and stability of attachment, as measured by the Strange Situation at ages 1 and 4. Participants were 150 women and children. Women were first assessed during pregnancy and then yearly when the children were 1-4 years old. Overall, attachment was unstable for 56% of the sample from age 1 to age 4. Trajectories of DV and income both predicted attachment patterns. Positive outcomes (secure-secure and insecure-secure) were related to initially low levels of DV that stayed constant or became lower as well as initially high or low levels of income that increased over time. The importance of understanding trajectories of risk and protective factors for stability of attachment are discussed.
INTRODUCTION

The focus of the current research is to better understand developmental pathways that result in stability or instability in child-mother attachment in a heterogeneous-for-risk sample selected to over-represent domestic violence (DV: defined as male violence against his female romantic partner). Attachment theory predicts stability of attachment in individuals over time, while allowing that environmental factors may, on occasion, influence a change in attachment quality (Bowlby, 1969/1982). Infant attachment is usually assessed in early childhood by administering the Strange Situation Procedure (Ainsworth, Blehar, Waters, & Wall, 1978), a 22-minute paradigm during which the mother and child experience two separations and reunions. Briefly, child attachment is classified into secure and insecure categories, with a further subdivision of insecure into avoidant, ambivalent, and disorganized categories. Securely attached babies are distressed at the mother’s departure but are easily soothed upon her return (Carlson & Sroufe, 1995). Avoidant babies typically do not show a reaction to the mother’s departure and appear indifferent to her return. Ambivalent babies are highly distressed at the mother’s departure and are very difficult to soothe when she returns. Children are classified as disorganized when they do not show a consistent strategy in the reunions with the mother. They also frequently show odd behaviors, such as freezing and disorientation (Van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999).

In young children, specifically, Bowlby considered attachment to be sensitive to environmental changes, but later in childhood, attachment quality may become more resistant to change. Empirical support for this supposition has been found (Fraley, 2002); however, longitudinal research has not yet determined the interplay of individual and contextual factors that might influence the stability and instability of early child-mother attachment. Understanding
the factors which can affect attachment stability is critical to designing interventions that can either increase the likelihood that children with insecure attachment move toward security or help children to maintain stability of secure attachment.

To date, longitudinal research on attachment has only examined two time periods in a child’s life. Studies of attachment in low risk populations have reported 1-year stability rates ranging from 53% to 78% (Owen, Easterbrooks, Chase-Lansdale, & Goldberg, 1984; NICHD ECCRN, 2001; Thompson, Lamb, & Estes, 1982). In these studies, the stability is highest for the secure group. Similarly, studies of attachment in high-risk and heterogeneous-for-risk populations have also reported stability rates that exceed chance, ranging from 50-60%, particularly when the two assessments are within 1 year (Barnett, Ganiban, & Cicchetti, 1999; Easterbrooks, 1989; Egeland & Farber, 1984; Vondra, Hommerding, & Shaw, 1999).

Individual characteristics of the mother, the mother’s relationship with her partner, and the demographic characteristics of the family and the child are key predictors of stability or instability of attachment (Egeland & Farber, 1984; Moss, Cyr, Bureau, Tarabulsy, & Dubois-Comtois, 2005; NICHD ECCRN, 2001; Vondra et al., 1999). These findings are consistent with Bowlby’s theory as well as a developmental psychopathology perspective, which suggests that children’s behavior results from the influence of numerous factors existing at multiple levels of the ecology, and not from one specific factor (Finkelhor & Kendall-Tacket, 1997; Masten, Best, & Garmezy, 1990).

However, extant studies of stability/instability of attachment assess contextual predictors and attachment status concurrently. This methodology fails to measure these same contextual predictors prior to the first assessment of attachment (typically at about age 1). As we describe later, research indicates that prior maternal history, particularly during pregnancy, can have a
strong influence on the mother-child relationship. In addition, the concurrent measurement of criterion and predictors at 2 time periods (e.g., ages 1 and 4) can only assess whether a linear change in predictors is related to attachment stability/instability. Neither the trajectory of child development, nor the trajectories of contextual factors that occur with it, are likely to be linear. The inclusion of data from predictors at five time points (during pregnancy and throughout early childhood) allowed us to assess, in addition to linear change, other patterns of change. We also determined whether these linear or non-linear patterns of change were related to linear or non-linear patterns of change in the predictors of attachment stability/instability. We examined three contextual predictors (DV, household income, and maternal depressive symptoms) that have been previously associated with instability of attachment as well as with problematic child outcomes associated with children’s exposure to DV. As reviewed below, these risk factors have been associated with attachment concurrently or have predicted attachment at a later time period; however, there is no research examining trajectories of attachment and their relationship to trajectories of these risk factors.

**DV and Attachment**

Bowlby noted that the attachment system becomes activated as the child experiences fear when confronted with two specific threats: a threat to the caregiver or a threat in the child’s environment. Kobak and colleagues (2004) identified 4 specific trauma-related threats to attachment, one of which is “physical or sexual abuse of a parent.” Thus, the child’s exposure to DV is a stress that can have consequences for attachment.

Recent research suggests that stress experienced by the pregnant mother might influence the child *in utero*. While the mother is pregnant, the trauma itself, as well as the biological
correlates of maternal stress may affect brain development, and, thus, permanently influence the child’s responses to stress after birth (see Schore, 2003).

Research finds that women who experienced DV during their pregnancies had significantly more negative caregiving schemas of their unborn babies (Huth-Bocks, Levendosky, Bogat, & von Eye, 2004) and were more likely to be classified as non-balanced (similar to insecure), than those who did not experience pregnancy DV (Huth-Bocks, Levendosky, Theran, & Bogat, 2004). In addition, prenatal representations predict observed maternal parenting at age 1 (Dayton, Levendosky, Davidson, & Bogat, 2010).

Postpartum, DV continues to play a role in the organization of child attachment. When women experienced DV prenatally and postpartum or experienced DV for the first time during the first year of their children’s lives, their children were likely to either maintain insecure attachments or develop them by age 4. However, women who left the abusive relationship after the child was born were more likely to demonstrate balanced postpartum maternal representations, and the child was then more likely to become securely attached by age 4 (Levendosky, Leahy, Bogat, Davidson, & von Eye, 2009).

Importantly, DV is generally an episodic experience. Women often move in and out of violent relationships (e.g., Bogat, Levendosky, Theran, von Eye, & Davidson, 2003; Fleury, Sullivan, Bybee, & Davidson, 1998), and violence within relationships ebbs and flows (Feld & Straus, 1989; Follingstad, Hause, Rutledge, & Polek, 1992; Pagelow, 1981; Wofford, Mihalic, & Menard, 1994). This could affect children in two ways: (1) women’s parenting sensitivity may fluctuate depending on whether DV is present or absent at any given time, and (2) children’s exposure to DV may be consistent or intermittent. In the latter case, Martinez-Torteya, Bogat,

**Maternal Depressive Symptoms and Attachment**

Parental depression has deleterious effects on parenting and children’s functioning (e.g., Lyons-Ruth, Lyubchik, Wolfe, & Bronfman, 2002; Rogosch, Mowbray, & Bogat, 1992; Sameroff, Seifer, & Zax, 1982); however, not all children are negatively affected (see NICHD ECCRN, 1997). Depression may contribute to less optimal caregiving behaviors by reducing mothers’ attention and interest in their children (e.g., Gelfand & Teti, 1990; Zahn-Waxler Iannotti, Cummings, & Denham, 1990), thus decreasing maternal availability to assist the child with emotion regulation (e.g., Cummings & Cicchetti, 1990; Zahn-Waxler et al., 1990). Maternal depression may have stronger effects on young children, compared to older children, because of their nearly total dependence on the caretaker (Beardslee, Bemporad, & Klerman, 1983; Cummings & Cicchetti, 1990).

Maternal depression is associated with insecure infant-mother attachment (Lovejoy, Graczyk, O’Hare, & Neuman, 2000; Lyons-Ruth et al., 2002), the stability of insecure attachment among infants (Edwards, Eiden, & Leonard, 2004), and movement towards insecurity from infancy to early adulthood (Weinfield, Whaley, & Egeland, 2004).

DV is also associated with elevated depressive symptoms in women (e.g., Bogat et al., 2003; Kessler, Molnar, Feurer, & Appelbaum, 2001), but the symptoms are related to timing and duration of DV. Bogat and colleagues (2004) found elevated depressive symptoms for both abused and non-abused women during pregnancy, which, for most women, then diminish and plateau in the first two years of the child’s life. However, for women who consistently experience abuse during this time, symptoms again worsened by their children’s second year of
Household Income and Attachment

Poverty, which often co-occurs with DV (Tolman & Raphael, 2000), has been linked to increased risk for insecure attachment (e.g., Bakermans-Kranenburg, van IJzendoorn, & Kroonenberg, 2004; Egeland & Sroufe, 1981; IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999; NICHD, 2001). The “family stress model” posits that socioeconomic disadvantage affects parenting practices, which then influence children’s development (Bakermans-Kranenburg et al., 2004; Conger, Conger, Elder, & Lorenz, 1992; 1993).

Poverty has been associated with less consistent, attentive caregiving and less emphasis on infant needs compared to personal or familial needs (Aber, Jones, & Cohen, 2000; Cain & Combs-Orme, 2005). Recent results generally support this conclusion, but they also suggest that the effects of SES on children’s attachment may not be entirely mediated through diminished parenting sensitivity (NICHD ECCRN, 2001).

Summary and Hypotheses

We examined whether maternal depressive symptoms, household income, and DV predicted patterns of stability and instability of attachment from age 1 to 4 in a heterogeneous-for-risk sample, chosen to over-represent the incidence of DV among pregnant women. We hypothesized that trajectories related to the timing and duration of several contextual variables (DV, maternal depressive symptoms, and low income) would be related to patterns of stability and instability of attachment classifications. Based on findings from prior literature examining two time periods, we expected that increasing levels of risk factors would be associated with stability of insecure attachment or movement towards insecure attachment. We also expected that decreasing levels of risk factors would be associated with stability of secure attachment or
movement towards secure attachment. However, because women move in and out of DV relationships, and because of the different amounts of time that they experience (and their children are exposed to) DV, it was important to run models that allowed for more than differential linear slopes. Thus, we accommodated fluctuations over time in the independent variables by allowing for non-linear curvatures. However, because this is a first exploration of attachment pattern trajectories, there was no current theory or empirical research to guide *a priori* predictions about the exact shape of these trajectories.

**METHODS**

**Participants**

Participants were 150 women and their target children enrolled in a larger longitudinal study (*N* = 206) examining risk and resilience factors for women and children experiencing DV. Women and children were only included in this research if they had completed the Strange Situation at both ages 1 and 4. The 56 women who did not complete the Strange Situation included 18 who either refused participation or could not be located in the age 1 data collection wave, 15 who either refused participation or could not be located in the age 4 data collection wave, and 23 who were not able to be interviewed in project offices at either the age 1 or age 4 data collection wave. The participants did not differ from the non-participants in marital status, education, race/ethnicity, receipt of public assistance, or level of prenatal DV. Participants had significantly higher income during pregnancy than those who did not participate [*t* (202) = 2.30, *p* < .05].

The women for the larger study were recruited by placing flyers announcing the study in various sites in the community that served women (e.g., ob/gyn clinics). There were two types of flyers, one recruiting specifically for participants experiencing DV and the other recruiting for
a mother-baby study. In order to participate, women had to be between the ages of 18 and 40, pregnant at the time of the first interview, involved in a romantic relationship of at least 6 weeks duration during the pregnancy, and fluent in English. Women were first interviewed during their third trimester of pregnancy; subsequent interviews occurred yearly at the time of the children’s birthdays. Informed consent was obtained for each woman and her target child at each wave of data collection, while assent to participate was obtained from each child at age 4.

The women were 62% Caucasian, 25% African American, 5% Latina, 5% bi-racial and 3% of other ethnic/racial backgrounds. During pregnancy, 47% were single, 43% were married, and 10% were separated/divorced/ widowed. Almost half (42%) had completed high school or less, 44% had completed some college or trade school, and 14% had a college or graduate degree. The participants were comparable on ethnicity and education level to the population statistics from the 2 counties where 93% of the sample was recruited (U.S. Census Bureau, 2000). However, the distribution of participants’ income levels was different, such that 57% of the participants had incomes less than $20,000 annually, while only 31% of the women in these 2 counties had incomes in that range. There were 72 male and 78 female child participants. Forty-seven percent of children were Caucasian, 25% African-American, 24% bi-racial, and 4% Native American, Asian or Latino/a.

Measures

Demographics. Demographic information, including race/ethnicity, maternal age, maternal years of education, household income, and gender of the child were obtained. We analyzed household income because of the important relationship between it and children’s outcomes (e.g., NICHD ECCRN, 2001).
Beck Depression Inventory (BDI: Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). This measure includes items about a variety of symptoms such as mood, sleep, and appetite disturbances. Each item is rated on a 0 to 3 scale, and all items are then summed. Higher scores indicate greater symptom severity. There is well-established reliability and validity of the BDI (see review by Beck, Steer, & Garbin, 1988). In the current study, the coefficient alphas were .85, .85, .87, .90, and .90, respectively at the 5 waves. Scores of 12 and above are considered indicators of mild to moderate depression (Beck et al., 1961). At each wave of data collection, 20-30% of the women reported scores above 12; the mean scores at each wave varied from 5.74 to 10.57.

Strange Situation Procedure (SS: Ainsworth, et al., 1978). The SS was administered when the children were age 1 and age 4. The SS is a 22-minute laboratory procedure in which the child and mother participate in 8 episodes of play, separation, and reunion. The series of episodes is considered to be mildly to moderately stressful for the young child and, thus, induces particular attachment behaviors, such as crying, clinging, and withdrawal. At age 1, child behaviors are coded on four, 7-point scales: proximity seeking, contact maintenance, avoidance, and resistance (Ainsworth et al., 1978) and one, 9-point scale for disorganization (Main & Solomon, 1986). For the age 4 SS, child behavior is coded on 3 scales [a 9-point scale of security, a 7-point scale of avoidance, and a 9-point scale of disorganization (Cassidy & Marvin, 1992)] based on the following behavior: proximity/contact seeking, body orientation, speech, gaze, and affect. Children at both ages were classified into one of the following attachment categories: Secure, Insecure-Avoidant, Insecure-Ambivalent, or Disorganized/Controlling. Disorganized children were grouped with the two insecure categories for analyses.
Some researchers have suggested that the duration of separation in the SS may not be long enough to activate the attachment system in preschoolers (Solomon & George, 1999). However, the SS has been widely used with this age group, with inter-rater reliability ranging from 75-92% (Bar-Haim, Sutton, Fox, & Marvin, 2000; Bretherton, Ridgeway, & Cassidy, 1990; Marvin & Pianta, 1996; NICHD ECCRN, 2001; Shouldice & Stevenson-Hinde, 1992). Secure and insecure classifications at age 4 are related to classifications in other preschool paradigms assessing attachment representations (Bretherton et al., 1990: 75% concordant, p < .01) as well as showing expected relationships with maternal behavior, child behavior, mother-child interaction, and history of maltreatment (Cicchetti & Barnett, 1991; Moss, Bureau, Cyr, St-Laurent, & Mongeau, 2004; NICHD ECCRN, 2001; Stevenson-Hinde & Shouldice, 1995). Indeed, later assessments of attachment may provide stronger information regarding child risk for subsequent problematic outcomes; a recent meta-analysis of 69 studies indicated a larger effect size for preschool (vs. infant) SS attachment classifications in relation to childhood externalizing behavior problems (Fearon, Bakermans-Kranenburg, Van IJzendoorn, Lapsley, & Roisman, in press).

SS videotapes were coded at the University of Washington. At age 1, there was a 90% agreement rate (k = .84; p < .001), based on 11% double-coding. For age 4, the agreement rate was 76% (k=.53; p < .001), based on 35% double-coding. Differences in classifications were settled through conferencing.

Severity of Violence Against Women Scales (SVAWS: Marshall, 1992). The SVAWS is a 46-item questionnaire that measures threats of violence, actual physical violence, and sexual violence ranging from mild to severe during the past year. Threats of violence are included in this measure because they are a form of psychological abuse. Men are often able to control their
partners through threats, without the need to enact physical violence. Both physical and psychological abuse negatively affect women’s mental health and functioning (Baldry, 2003; Follingstad, 2009; Levendosky & Graham-Bermann, 2000; Morland, Leskin, Block, Campbell, and Friedman, 2008). Participants indicated how often they experienced these events based on a 4-point scale ranging from “Never” to “Many times,” and all items are then summed. Women completed the questionnaire during pregnancy and on the children’s birthdays (ages 1, 2, 3, and 4). Dutton, Pianta, and Marvin (2001) found that women’s reports of abuse on the SVAWS correlated with their partner’s reports. In our sample, the coefficient alphas were .95, .95, .95, .99, and .94, respectively at the 5 waves.

Procedures

Women who were interested in participating telephoned project offices and were then screened for inclusion criteria. After approximately half of the sample was recruited ($n = 96$), we began exclusively using the flyer recruiting women who had experienced DV as well as conducting telephone screening with the Conflict Tactics Scale (Straus, 1979) in order to increase the number of pregnant women experiencing DV in our sample. There were no demographic differences between the excluded women and the participants. For the 150 participants in the present study, 87 women experienced DV during their pregnancies; 63 women did not.

RESULTS

Missing Data

Missing data were imputed using the “hot-deck method” (Lisrel 8.8; Jöreskog & Sörbom, 2009). This method was used because it substitutes real values for missing values, obtaining the real values from another participant whose responses on specified variables most closely match
those of the participant with missing data. One advantage of this procedure is that the
correlations among the predictor variables across time will not be artificially increased (see
Table 1). Four women were missing SVAWS data at one time period, and five women were
missing household income data at one time period.

Data Analyses

Attachment Classifications

At age 1, 17.3% of the children were classified as Avoidant, 56% as Secure, 16% as
Ambivalent, and 10.7% as Disorganized. At age 4, 18.7% of the children were classified as
Avoidant, 64% as Secure, 3.3% as Ambivalent, and 14% as Disorganized. Overall, 44.3% of the
children demonstrated stability of attachment with their mothers from ages 1 to 4; this agreement
was not significantly greater than chance (see Table 2). When collapsed into groups of Secure
and Insecure classifications (children with disorganized attachment were collapsed into the
Insecure category), 57.4% stayed concordant. This was still not better than chance \( p = 0.07 \).

Due to sample size constraints, the collapsed groups of Secure and Insecure were used for the
rest of the analyses. Based on classifications of attachment from age 1 and age 4: secure-secure
\( n = 58 \), secure-insecure \( n = 26 \), insecure-secure \( n = 38 \), and insecure-insecure \( n = 28 \).

Factors Related to Stability and Instability of Attachment

We chose to conduct repeated measures ANOVAs rather than structural equation
modeling because of (1) the constraints of our sample size, and (2) the advantage of examining
the differential predictability of change in attachment from the longitudinal trajectories of the
predictors (i.e., DV, income, and maternal depressive symptoms). The trajectories could be linear
as well as accelerating, decelerating, and changing in acceleration or deceleration. The
dependent variables were regressed on the relevant covariates at each time point, and the
unstandardized residuals from these regressions were then used in the repeated measures analyses.

Prenatal DV was covaried in the analyses that did not involve DV as a predictor. In addition, because the women were heterogeneous on socioeconomic status (SES), indices of SES (i.e., maternal level of education and income during pregnancy) were also covaried in the analyses. However, the analyses that involved income as a predictor only covaried education and DV. Maternal level of education and family income were significantly correlated ($p = .38$); however, we included both because they only share 14% of their variances and together, they are solid proxy variables of SES. In addition, correlated predictors’ contributions are not always diminished in analyses when they are simultaneously included in regression models.

The pattern of security/insecurity of attachment was not related to the demographic variables of maternal age, maternal or child ethnicity, or maternal marital status. However, the pattern was significantly related to gender; thus, gender was included as a factor in each repeated measures ANOVA.

Domestic violence. A repeated measures ANOVA with polynomial decomposition examined the relationship between trajectory of DV and the pattern of attachment over time and gender (the pregnancy interview variables of maternal education and family income were covariates). The covariates were not significantly related to the outcomes. The multivariate tests indicated a significant time x pattern interaction [$F(12, 150) = 2.01, p < .05, \eta^2 = .05$]. The within-subjects tests indicated a significant interaction of time x pattern [$F(12, 150) = 1.79, p < .05, \eta^2 = .04$]. There was a significant quadratic effect of time x pattern [$F(3, 150) = 5.49, p < .05, \eta^2 = .09$], indicating differential curvature in the trajectories of these groups. See Figure 1. These patterns show the following: (1) the secure-secure group began with relatively low rates of
DV that remained low over time, (2) the secure-insecure group had low rates of DV initially, and showed a convex and then concave trajectory with a higher mean at the last time period, (3) the insecure-secure group had low rates of prenatal DV and also showed a slight decrease over time, rising to initial levels at the last time point and (4) the insecure-insecure group had high rates of prenatal DV with a concave trajectory.

Finally, there was a significant between-subjects main effect of gender \([F(1, 143) = 5.36, p < .05, \eta^2 = .04]\), such that mothers of girls had higher levels of DV at all time periods. There were no other significant effects.

**Income.** A repeated measures ANOVA was conducted. The covariates, DV during pregnancy and maternal education, were not significantly related to the outcomes. Multivariate tests revealed a significant time x pattern interaction \([F(12, 150) = 1.87, p < .05, \eta^2 = .05]\) with a significant within-subjects interaction of time x pattern \([F(12, 150) = 1.96, p < .05, \eta^2 = .05]\). There was a significant cubic effect, indicating change in curvature at different points between the groups \([F(3, 150) = 5.57, p < .05, \eta^2 = .10]\). See Figure 2.

The secure-secure group had a fairly flat trajectory of moderate income. The secure-insecure group also began with a relatively higher income which had a slight concave trajectory. The insecure-secure group began with a relatively low income with a strong concave trajectory, ending slightly higher than they began at age 4. Finally, the insecure-insecure group had the lowest prenatal income, with a fairly flat trajectory. There were no other significant main or interaction effects.

**Maternal Depressive Symptoms.** A repeated measures ANOVA was conducted. Pregnancy DV, maternal education and family income were used as covariates; they were not significantly related to the outcomes. The multivariate tests revealed a significant time x gender
interaction \[F(4, 150) = 2.63, p < .05, \eta^2 = .07\]. The within-subjects time x gender interaction was significant \[F(4, 150) = 2.85, p < .05, \eta^2 = .02\], with a quadratic effect \[F(1, 141) = 6.67, p < .05, \eta^2 = .05\]. Mothers of girls had a U-shaped curve for depression; they were most depressed during pregnancy and when their daughters were age 4. Mothers of the boys had an inverted U-shape for depression; they were most depressed when their sons were age 2. There were no other significant main or interaction effects.

DISCUSSION

This study represents a unique contribution to the fields of DV and attachment research in young children. It provides a first examination of developmental trajectories of risk factors that predict attachment stability in a sample characterized by an over-representation of DV. The importance of examining more than two time periods of the independent variables is borne out by our findings; the relationship between stability/instability of attachment and the predictors is complicated, and not linear.

In our research, the stability rates of attachment from age 1 to age 4 were between 44% and 57%, depending upon whether a 2-group or 4-group classification was used. These are similar to prior studies of high-risk and heterogeneous samples (e.g., Barnett et al., 1999; NICHD ECCRN, 2001). Our study adds to the literature by extending the assessment of attachment stability from 12 to 48 months in a heterogeneous sample; the only other stability assessments greater than 36 months were in low risk samples (e.g., Bar-Haim et al., 2000; Gloger-Tippelt, Gomille, Koenig, & Vetter, 2002).

Only about half of the children in our sample manifest stable attachment from infancy to preschool. These high rates of instability are consistent with other studies finding that the stability of the caregiving environment is a better predictor of later child outcomes than infant
attachment (Belsky & Fearon, 2002; NICHD ECCRN, 2006; Sroufe, Egeland, Carlson, & Collins, 2005; Tarabulsy et al., 2005). The child’s representational advances in cognitive and emotional development at age 4 (e.g., Thompson, 2000) may make these children more sensitive to changes in their home environments.

Linear slopes in the trajectories of DV and household income explained little variance; it was the curvatures (cubic for income and quadratic for DV) of the trajectories that predicted the patterns of stability and instability. For example, for the secure-insecure group, who started with low levels of DV during pregnancy, which increased, decreased, and then increased again, high levels of DV at age 4 appeared to disrupt the high quality of the mother-infant relationship that began during the first year of the child’s life. Perhaps the mother, in response to DV, became less involved with her child, or more distracted in her caregiving, as she coped with the conflict and violence in her relationship with her partner. Alternatively, the child’s developing emotion regulation, which is part of the attachment system, may have become dysregulated by the trauma of witnessing DV or its after-effects. Our findings are consistent with prior research indicating that contextual risk factors during pregnancy affect children’s functioning through the first year of life (Benoit, Parker, & Zeanah, 1997; Huth-Bocks, Levendosky, Bogat, & von Eye, 2004; Lieberman, 1999). However, our findings also suggest that high levels of DV during pregnancy appeared to disrupt the mother-infant relationship throughout the first 4 years of the child’s life. This may be related to the mother’s working models of caregiving that are disrupted by pregnancy DV (Huth-Bocks, Levendosky, Theran, & Bogat, 2004). However, our analyses do not allow us to distinguish fully the effects of pregnancy DV from DV occurring during the postpartum period.
The cubic trajectory of income, controlling for the effects of prenatal DV, was also related to the change and stability of attachment. Socioeconomic disadvantage has been associated with negative parenting behaviors, but it also may affect aspects of the home environment that contribute to attachment security, including consistency of caregiving, stability of housing, and parental involvement. Our results for the effects of income during pregnancy, as well as stability of income from pregnancy to age 4, are similar to recent findings demonstrating that lower levels of economic well-being, and the corollary of elevated perceptions of economic pressure, can indirectly affect parenting behavior and child well-being through an adverse impact on parental psychological well-being (Mistry, Vandewater, Huston, & McLoyd, 2002).

However, instability of attachment was not related in predictable ways to income. The women in this study did not have particularly high household incomes; thus, our results might not be generalizable to all women. Also, factors associated with income (e.g., life stress) might be more predictive of stability and instability of attachment. We did not have life stress/life events data for all time periods; thus, future research is needed to explore this possibility.

Surprisingly, the trajectory of maternal depressive symptoms was not associated with attachment stability or instability when prenatal DV was controlled. Prior research indicates that, among infants, maternal depression is associated with the stability of insecure attachment (Edwards et al., 2004) as well as movement from security to insecurity from infancy to early adulthood (Weinfield et al., 2004). Our research measured maternal depressive symptoms beginning in pregnancy, whereas the other studies did not. Thus, direct comparisons between our research and other studies are not possible. However, the lack of a relationship between depressive symptoms and attachment stability/instability may reflect that most individuals in our sample did not have clinical levels of depression (the mean scores for all attachment groups at
each time period did not reach the suggested clinical cut-off for the BDI). Alternatively, other research did not measure women’s experiences of DV during pregnancy; these experiences may be better predictors of attachment than depressive symptoms.

However, there was a time x gender finding such that the trajectory of depressive symptoms was reversed for mothers of boys and girls. Prenatally, the mothers of girls had higher depression scores. However, this may be an artifact related to the fact that they were also more likely to be in abusive relationships (see below). Postnatally, the findings, which do not correlate with the DV findings for gender, may instead reflect other difficulties in the mothers’ lives, such as perceptions of differential difficulty of parenting boys and girls which are age-related or amount of social support given to mothers of boys and girls at different ages.

Mothers of girls had higher levels of DV at all time periods compared with mothers of boys. This is a surprising finding and may suggest that mothers of girls are at particular risk for DV. One possible interpretation is that mothers of boys may be more likely to leave the DV relationship, fearing that boys may model the aggression of the adult male in the family. This fear has been previously reported in the literature but not specifically linked to leaving the partner (e.g., Levendosky, Lynch & Graham-Bermann, 2000). There is no research examining whether gender of the child predicts whether a woman stays with or leaves her partner. However, our results suggest a fruitful area for future research.

Conclusions and Limitations

Our results support the broader theory that attachment classifications can change over time in response to life experiences that directly affect the caregiving environment. In particular, for children with unstable life circumstances, there may be many opportunities to move toward or away from security.
Our research also demonstrates the importance of multiple assessments of risk factors over time lest simple linear changes be presumed to be associated with changes in attachment stability. Rather, the picture is more complex and suggests that certain periods of the child’s early development may be more or less vulnerable to the influences of contextual risk factors, such as DV or income. While this study did not assess the possibility of sensitive periods, this would be an important direction for future research.

Especially important was our finding that DV during pregnancy was a risk factor for insecure attachment at age 1. Social policies sensitive to these findings would ensure adequate resources, including financial assistance and mental health services for pregnant women as well as the frequent monitoring of medical and psychological well-being of women who are experiencing or at risk for DV. Our findings emphasize the importance of training physicians and other health care professionals working with pregnant women to conduct adequate assessments for DV.

In addition, trajectories of stable low income and rising DV were also associated with maintenance of insecurity or movement toward insecurity in the preschool children. This suggests that mild or moderate levels of DV should not be ignored. For example, pediatricians could administer a brief DV screen to the mother during every well-child visit to evaluate this, and recommend appropriate treatment. A recent meta-analysis showed that moderate-length interventions targeting the mother-child relationship are successful in increasing sensitivity and changing attachment quality (Bakermans-Kranenburg et al., 2003) in generally low-risk populations. One example of this type of intervention applied to families with DV is the child-parent psychotherapy for preschool children developed by Lieberman and colleagues (Lieberman, van Horn, & Ghosh-Ippen, 2005). For those mothers who do not leave the abusive
relationship, perhaps such interventions might counter-act the influence of increasing levels of DV.

Our findings should be interpreted cautiously, as all contextual measures were obtained from a single reporter, the mother. Another measurement limitation was the lower reliability of the Strange Situation coding at age 4; however, our inter-rater reliability is consistent with the MacArthur group guidelines (Solomon & George, 2008). In addition, we used continuous measures of all predictors. This allowed us to determine that higher or lower levels of the predictors were associated with risk; we could not determine whether a risk factor was only predictive when it reached a particular threshold or was under a particular baseline. For example, maternal depressive symptoms may only be associated with attachment stability when the mother fits diagnostic criteria for a mood disorder. Finally, because of the size of our sample and the need to analyze data from multiple time points, we could not test all of the predictors in one model. The covariance matrix of 1770 entries would not yield a model that would converge with 150 participants. Future research with larger samples may be able to do so.

Overall, the findings from this study demonstrate that attachment from infancy to early childhood is influenced by trajectories of family-level risk factors. Changes in risk factors over time are related to stability and instability of attachment in meaningful ways. Understanding what can lead either to stability of secure attachment or instability involving movement to secure attachment is important for clinicians as they design and implement interventions with high-risk families. The findings from this study highlight the importance of considering the ecological context within which the child-mother attachment relationship occurs in order to develop the most effective interventions. Finally, the findings suggest the importance of providing support to
pregnant women and mothers of young children so that the likelihood of long-term trajectories of risk for children’s functioning can be ameliorated.
References


Table 1. Correlations of the predictor variables over time.

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* p < .05
Table 2.

Distribution of Strange Situation Classifications from age 1 to age 4

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Note. 44.3% agreement, $\kappa = .07; \chi^2(9, N = 150) = 9.76, p = .37$. When collapsed into Secure/Insecure groups, there was 57% agreement, $\kappa = .12; \chi^2(1, N = 150) = 2.11, p < .15$. 
Figure Captions.

Figure 1. Four attachment pattern groups and the trajectory of domestic violence from pregnancy through age 4.

Figure 2. Four attachment pattern groups and the trajectory of income from pregnancy through age 4.
Figure 1.
Figure 2.