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## Multi-risk Infants: Predicting attachment security from sociodemographic, psychosocial, and health risk among African-American preterm infants

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### Abstract

**Background**—Ecological and transactional theories link child outcomes to accumulated risk. This study hypothesized that cumulative risk was negatively related to attachment, and that maternal sensitivity mediated linkages between risk and attachment.

**Methods**—112 high-risk African-American premature infant-mother dyads participated. Psychosocial (maternal depression, stress and self-efficacy) and sociodemographic risk (poverty, maternal education, marital status) were maternal self-report (0–4 months). Infant health risk was obtained from hospital charts. Infant-mother attachment (12 months) and maternal sensitivity (4 months) were assessed with Q-sort measures.

**Findings**—Psychosocial and sociodemographic, but not infant health risk, negatively related to attachment. Both were mediated by maternal sensitivity.

**Conclusions**—The impact of risk domains on attachment security was mediated by maternal sensitivity. Results emphasize the need for early intervention programs targeting premature infants to identify and address environmental and personal factors that place parenting at risk.

### Keywords

Cumulative risk; maternal sensitivity; attachment

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Premature infants comprised 12.8% of US births in 2006 (Martin, Hamilton, Sutton et al, 2009) and are at risk for delays in motor/neurologic function, intelligence and academic achievement, language, executive function, and behavior into school-age years (Aylward, 2005; Zwicker & Harris, 2007). Premature birth is also associated with socioeconomic disadvantage (Messer, et al., 2008), which increases developmental risk (Engle & Black, 2008; McLoyd, 1998). Infants with both prematurity and socioeconomic disadvantage have worse developmental outcomes than infants with prematurity alone (Candelaria, O’Connell, & Teti, 2006; Laucht, Esser, Schmidt, 1997). This study of socioeconomically disadvantaged African-American families examined linkages between three cumulative risk domains: sociodemographic, psychosocial, and infant health, and quality of infant attachment security - a pivotal component of early social and emotional development (Sroufe, 2005).

This study draws its conceptual foundation from ecological and transactional developmental theories, and from attachment theory. Ecological/transactional perspectives propose that child development is influenced by "proximal" and "distal" factors (Sameroff, 2009). Proximal factors are directly influential processes such as unresponsive, insensitive parenting, that place children at risk for poor outcomes (McLoyd, 1998), including insecure attachment (Atkinson, et al., 2000a; Teti & Candelaria, 2002). Maternal sensitivity is identified both theoretically and empirically as "the" core determinant of attachment security (Atkinson, et al., 2000a; DeWolff & van IJzendoorn, 1997). Distal factors influence the child indirectly, often through influences on the caregiver. Maternal factors, such as state of mind regarding attachment (van IJzendoorn, 1995), maternal mental health (Atkinson, et al., 2000b) and maternal education (Tarabulsy et al., 2005), predict attachment, often operating directly and indirectly through effects on maternal sensitivity. Thus, multifaceted models of attachment security that include ecological and maternal factors are warranted and should be further explored (Belsky, 1999; De Wolff & van IJzendoorn, 1997). This study builds on the findings of Tarabulsy et al. (2005) and others by examining: 1) relations between multiple risk sources and attachment security and 2) maternal insensitivity, the predominant "proximal" risk factor, as a mediator of the linkage between risks and attachment security.

This study examined cumulative health risk, psychosocial risk, and sociodemographic risk. Prematurity is typically not linked with attachment security (Easterbrooks, 1989). However, preterm attachment security may be compromised if parents' capacities to interact sensitively are affected by poor infant health (Cassibba et al., 2008; Poehlmann & Fiese, 2001), maternal depression, or neurological impairment (Brisch et al., 2005), or when sociodemographic risks are combined with severe health risks (Wille, 1991). Thus prematurity may compromise attachment security when combined with other risk factors. Maternal psychosocial risk has well-established theoretical and empirical linkages to mother-infant interaction and, in turn, attachment security (Atkinson et al., 2000b). Finally, sociodemographic risk is also linked with insecure attachment (Diener, Nievar, & Wright, 2003). Based on previous findings (e.g. Tarabulsy et al., 2005), we expected sociodemographic risk to directly influence attachment security, and to be mediated by maternal sensitivity.

A central tenet of ecological and transactional theories is that development is more compromised when children are exposed to multiple risks simultaneously (Rutter, 1979). Cumulative risk is negatively related to child health, cognitive and social development (Candelaria, et al., 2006; Laucht, et al., 1997; Liaw & Brooks-Gunn, 1994; Trentacosta, et al., 2008), and with insecure attachment (Belsky, Roesenberger, & Crnic, 1995; Fish, 2001). Traditionally, proximal and distal sources of risk have been combined into one index. However, this approach is not well-rooted in ecological theory as it does not consider that distal risks will indirectly impact children through their effects on proximal risk processes. Researchers have begun to examine cumulative risk in specific domains, comparing and contrasting varying types of risk, and examining moderating and mediating models, allowing for a more sophisticated cumulative risk models (e.g. Klebanov & Brooks-Gunn, 2006; Krishnakumar & Black, 2002).

In this study, we sought to examine how sociodemographic, psychosocial, and infant health predict infant attachment security in a sample of predominantly low-income, African-American preterm infants, and whether maternal sensitivity mediates these relations, as attachment theory would predict. The present study was part of a larger investigation of the impact of an intervention program beginning shortly after birth designed to promote premature infant development and the parent-infant relationship (Teti et al., 2009). The present study is not an investigation of intervention effects.

Three research questions were addressed:

1. What are the unique influences of sociodemographic, psychosocial, and infant health risk on attachment security? We hypothesized that increased sociodemographic and psychosocial risks would negatively predict attachment security (Atkinson et al., 2000b; Tarabulsy, et al., 2005).
2. Do risk domains interact in predicting infant-mother attachment? Interactive models have suggested that health risk may impact attachment security when maternal psychological risk is present (Poehlmann & Fiese, 2001). Thus, the second hypothesis was exploratory whether risk domains interacted in predicting attachment security.
3. Are linkages between risk domains and attachment security mediated by maternal sensitivity? Based on attachment theory and studies of ecological risk (Tarabulsy, et al., 2005), we hypothesized that risk would predict attachment security through its influence on maternal sensitivity.

## Methods

### Participants

Participants were infants born < 37 weeks gestational age (GA) and < 2,500 grams and their mothers recruited from 4 hospitals in Baltimore and Washington, DC, as part of the Preterm Infant Development Study (PIDS), a randomized controlled trial examining the efficacy of an intervention aimed at facilitating infant development (Teti et al., 2009). Families were excluded if mothers had a positive toxicology screen, were under age 18 years, or if infants were diagnosed with a chromosomal abnormality. Random assignment to intervention or control groups balanced maternal education, father figure present, family income, parity, birthweight (BW), and infant gender across groups. This study included participants from both the intervention and control groups and intervention was statistically controlled in all analyses.

Of the 295 eligible families approached in the NICU, 168 consented and participated at baseline when infants were 32–36 weeks GA. Post-intervention (4 months), 134 (79%) participated; at one year, 124 (74%) participated. Twelve participants were excluded due to missing data, leaving an analysis sample of 112. Attrition analyses found no significant differences between completers and non-completers on gender, intervention status, maternal age, maternal parity, GA, BW, length of hospital stay (LS), marital status, maternal education, poverty status, maternal sensitivity, parenting efficacy, depressive symptoms or parenting stress. Completers were older ( $M = 27.59$  years) than non-completers ( $M = 25.03$  years;  $F(1,165) = 4.79, p = .03$ ), and less likely to receive public assistance (73% vs. 90%,  $\chi^2(1) = 5.14, p = .02$ ).

Infants were evenly divided by gender (51.8% female) and parity (50.9% first-born). Mean GA was 29.97 weeks ( $SD=3.31$ , range=23–36), mean infant BW was 1373.01 grams ( $SD=502.65$ , range=500–2395), and average LS was 40.43 days ( $SD=29.20$ , range=5–124). Mean maternal age was 27.74 ( $SD=6.64$ ) years. At 12 months 39.3% of infants were receiving early intervention services. Receiving services was uncorrelated with attachment security and maternal sensitivity.

### Procedures

Data were collected at baseline, post-intervention, and 12 months corrected age. Infant health indicators were collected from NICU charts at baseline. All sociodemographic and psychosocial risk variables were obtained at baseline or post-intervention. Maternal

sensitivity was measured in the home at 4 months. Attachment security was assessed at age 1 year. The ethnic composition of the home visiting teams included European American, Hispanic, and Asian visitors, who worked to establish good rapport with study participants, and were uniformly welcomed into participants' homes.

## Intervention

The intervention aimed at increasing infant attachment, parenting, and development. Both intervention and control groups received social support and general developmental information during eight home visits over 4 months. Intervention mothers watched an educational video on preterm infants, learned infant massage, and received repeated demonstrations of the Neonatal Behavioral Assessment Scale (Brazelton & Nugent, 1995) to facilitate mothers' administration and interpretation of infant cues. Intervention effects appeared to be limited to higher maternal self-efficacy and Bayley MDI outcomes at 4 months (Teti et al., 2009).

## Measures

**Risk indices**—All risk variables (See Table 1) were dichotomized into risk/no risk based on clinical cutoffs, lowest/highest quartile, or criteria specific to the variable based on Sameroff's original work (Sameroff, et al., 1987).

Health risk was composed of GA, BW, and LS. Infants born very early and/or very light are at high risk for developmental delay (Aylward, 2005). Thus, very preterm infants (GA < 32 weeks) and extremely low BW infants (< 1000g) were assigned to the risk categories. LS risk reflected the longest duration quartile. Between 25% and 40% of the sample were included in each health risk condition (Table 1). GA, BW and LS were combined into a health risk index, ranging from 0–2 (Table 2).

Sociodemographic risk was composed of poverty, maternal education, and single-parent status, based on the sociodemographic questionnaire. Poverty was measured according to the Census Bureau's measurement of poverty threshold, using family income and size (U.S. Census Bureau, 2005). Below the poverty threshold, less than a high school education, and being single were designated as risk (Table 1).

Psychosocial risk was composed of maternal self-efficacy, maternal depressive symptoms, and parenting stress. Maternal self-efficacy was measured at 4 months with the Maternal Self-Efficacy Scale (MSES; Teti & Gelfand, 1991), a 10-item likert-scale questionnaire assessing self-efficacy in the mothering role. One global item taps into overall feelings of efficacy. The others elicit feelings of efficacy in specific parenting activities (e.g. feeding). The MSES has adequate concurrent validity and internal reliability (Teti & Gelfand, 1991). In this sample, Cronbach's alpha was 0.79.

Parenting stress was measured at 4 months with the Parenting Stress Index–Short Form (PSI-SF) a 36 item questionnaire designed to measure parent-child stress (Abidin, 1990; Abidin, 1995). The internal reliability of the PSI-SF is good (Abidin, 1990; Abidin, 1995), and was excellent in this sample (Cronbach's alpha=0.92).

Mothers' depressive symptoms were measured at baseline with the Beck Depression Inventory (BDI) (Beck, Ward, Mendelson, Mock & Erbaugh, 1961), a 21-item self-administered inventory of depressive symptoms. Individuals rate items from 0 (minimal symptom endorsement) to 3 (most severe). The BDI has strong psychometric properties (Beck, Steer, & Garbin, 1988) and adequate internal reliability (Cronbach's alpha=0.85) in the present study. BDI scores above 15 were coded as risk (Beck et al., 1988).

Table 1 presents the percentages of mothers and infants falling into separate risk categories. Table 2 presents the percentages of mothers and infants assigned specific risk scores in each risk domain. Approximately 30% of families had sociodemographic risk index scores  $> 1$ , and approximately 18% of families had psychosocial risk index scores  $> 1$ . About 19% of infants had infant health risk scores  $> 1$ .

### Home Observations

Home observations of maternal sensitivity and infant-mother secure base behavior were obtained through 45- to 75 minute home observations of mothers and infants in daily routines and in a semi-structured play session.

The Maternal Behavior Q-Sort was used to measure maternal sensitivity ([MBQ]; Pederson & Moran, 1995) at 4 months of age, taking into account maternal responsive behavior and sensitive detection of infant cues. The MBQ correlates significantly with attachment scores and the Ainsworth rating scales of maternal sensitivity (Pederson et al., 1990). MBQ Z-scores ranged from 0.06 to 2.65 ( $M=1.47$ ,  $SD=.48$ ), with a normal distribution (skewness=0.05).

Attachment security was measured by the Attachment Q-Sort (AQS) (Waters, Vaughn, Posada, & Kondo-Ikemura, 1995) at 12 months. The AQS is a measure of attachment security for children 1 to 5 years of age designed to capture the affective, behavioral and cognitive domains of attachment. AQS scores accord with Strange Situation classifications (Vaughn & Waters, 1990), relate positively to maternal sensitivity (Pederson et al, 1990) and have demonstrated validity with African-American Samples (Bakersmans-Kranenburg, van IJzendoorn & Kroonenberg, 2004). The AQS is usually measured in a natural environment and includes child exploratory behavior and responses to different parental behaviors (Van IJzendoorn, Vereijken, Bakersmans-Kranenburg, & Riksen-Walraven, 2004). Maternal Attachment Q-Sort Z-scores were 0.14–2.09 ( $M=.91$ ,  $SD=.42$ ), and were slightly positively skewed (skewness=0.58).

Both the MBQ and AQS consist of 90 behaviorally descriptive items that characterize the mother's behavior or the quality of the infant's secure base behavior in the mother's presence. Most characteristic items are placed at the higher end of the distribution and the least descriptive items at the lower end. Neutral or inapplicable items are placed in the middle piles. Individual scores are correlated with expert-derived criterion scores for the hypothetically most sensitive mother and most securely attached infant. Higher correlations indicate higher levels of maternal sensitivity or attachment security. Following Waters and Deane (1985), and Teti and McGourty (1996), MBQ and AQS correlational coefficients were transformed to Z-scores (Fisher's r-to-Z procedure) for analysis.

Observations of maternal sensitivity and attachment security were conducted by four doctoral graduate students, trained by the second author, blind to intervention status after establishing reliability. Inter-reliability intraclass correlations were 0.70–0.91 for maternal sensitivity, and 0.81–0.89 for attachment security, based on 20% of the sample. Associations between maternal sensitivity and attachment security were similar whether the same,  $r(62) = .61$ ,  $p < .001$ , or different observers were used across time,  $r(43) = .56$ ,  $p < .001$ . A Fisher's r-to-Z test indicated no difference in magnitude between the two correlations.

### Analysis Plan

Correlations were conducted to determine covariates. Hypotheses were tested using hierarchical multiple regression analyses. Associations of sociodemographic, psychosocial, and health risk indices with attachment security were examined, followed by interactions between risk domains and between each risk domain and intervention status, gender, and

maternal age (12 interactions total), using procedures outlined by Aiken & West (1991). The mediating effects of maternal sensitivity on the relations between risk domains and attachment security were examined using procedures from Baron and Kenny (1986) and the Sobel test using the criteria of  $z' > 0.97$  (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). Regression analyses statistically controlled for intervention status, infant gender, maternal age, and parity.

## Results

### Correlations

Correlations are presented in Table 3. Both AQS and MBQ scores were negatively associated with sociodemographic and psychological risk, but not infant health risk. Higher AQS scores related to female child gender and older maternal age. There were no interrelations among the three sources of risk, suggesting independent sources of risk.

### Regression Models

1. Risk indices were entered simultaneously into a multiple regression analysis, controlling for covariates. They collectively related to attachment security scores, explaining 10% of the variance (Table 4). Sociodemographic and psychological risk, but not health risk, were significantly and negatively related to AQS scores. Female gender and older maternal age were related to higher AQS scores.
2. There were no significant interactions among the three risk indices or between risk indices and intervention status, gender, or maternal age.
3. Sociodemographic and psychosocial risk, but not health risk, met mediation criteria of being associated with maternal sensitivity and infant attachment security (Table 3).

The significant relations between attachment security and both sociodemographic and psychological risk were significantly attenuated when maternal sensitivity was added to the model ( $z' = -2.06$ ,  $p < 0.01$  and  $z' = -1.78$ ,  $p < 0.05$  respectively; Table 4). Thus, following MacKinnon et al.'s (2002) criteria, associations between sociodemographic and psychosocial risk and attachment security were mediated by maternal sensitivity.

## Discussion

This study drew from ecological and transactional theories to examine linkages between sociodemographic, psychosocial, and infant health risk and attachment security in a low-income, urban, African-American sample of preterm infants. Sociodemographic and psychological risk were negatively associated with attachment security, with maternal sensitivity mediating linkages. Infant health risk was not associated with attachment security or maternal sensitivity.

Risk indices did not relate to or interact with each other, suggesting they function independently. Consistent with ecological models, these findings suggest that parent-child relations in multi-risk populations are negatively impacted by distal and proximal processes, and that distal influences are funneled through the proximal processes of maternal behavior. These results illustrate that early socio-emotional milestones are multiply determined and potentially modifiable.

These findings tie together several lines of research and offer a theoretically driven risk model to understand ecological determinants of attachment security in a sample of high-risk preterm infants. Cumulative risk and attachment security have been linked in full-term but

not preterm infants (Diener et al., 2003; Fish, et al., 2001). Among preterms, cumulative risk has been related to cognitive and social-emotional outcomes (Laucht et al., 1997 Candelaria et al., 2006; Liaw & Brooks-Gunn, 1994), but not attachment.

Our findings also add to the literature that supports maternal sensitivity as a final common pathway in the quality of infant attachment security (Sroufe, 2005; Teti & Candelaria, 2002) and as a central mediator of relations between distal risk factors and attachment security (Tarabulsky et al., 2005). This is consistent with De Wolff and van IJzendoorn's (1997) suggestion that attachment security and maternal sensitivity are sensitive to contextual factors, and with Atkinson et al. (2000b), who found links between maternal psychological risks and attachment security. Our findings are consistent with the expectation that cumulative risk works through maternal sensitivity in predicting attachment security.

A strength of these findings is that maternal sensitivity was measured before attachment security, suggesting that maternal behavior during the infants' early months affects attachment processes manifested by the end of the infants' first year. Although De Wolff and van IJzendoorn (1997) found a relatively weak link between maternal sensitivity and attachment security in low income samples, our findings suggest otherwise. Their investigation focused primarily on studies using the strange situation. Perhaps this discrepancy is partially explained by our use of Q-sort methodology. However, van IJzendoorn and colleagues found the AQS to have convergent validity with the Strange Situation Procedure and to have predictive validity with maternal sensitivity (2004), suggesting our findings transcend the impact of methodology.

Interventions designed to promote attachment security often focus on maternal sensitivity with modest to moderate effects (Bakermans-Kranenburg, van IJzendoorn & Juffer, 2003; van IJzendoorn, Juffer, & Duyvesteyn, 1995). Interventions focused on enhancing maternal sensitivity more effectively enhance attachment security than interventions focused solely on attachment security, even for families with multiple risks. If underlying sociodemographic and psychosocial risk factors influence maternal sensitivity, as our findings suggest, then targeting maternal sensitivity is logically more effective than focusing on attachment. Furthermore, successful interventions in high risk families may need to address socioeconomic and psychosocial risks as well as maternal sensitivity and attachment. In our own study, mothers with greater adherence to the intervention were more likely to have higher attachment security scores and had fewer risk factors suggesting that mothers with fewer risk factors may be better able to benefit more from intervention (Teti, Killeen, Candelaria, Miller, & O'Connell, 2009). Reducing risks may benefit and enhance maternal sensitivity, leading to improved attachment security, as well as enable caregivers to commit to intervention. More research is needed to determine how interventions focusing on reducing risks compare to interventions targeting maternal sensitivity and attachment.

Consistent with previous studies (Cassibba et al., 2008) infant health risk did not directly relate to attachment security. In the present study, maternal sensitivity and attachment security were assessed several months after infants' hospital discharge, and thus may not have been temporally linked to the period when prematurity alone would influence mother-infant interaction. Medical risk may also be more likely to influence cognitive or academic outcomes than socioemotional or behavioral outcomes. Liaw and Brooks-Gunn (1994) found that health risk in preterm infants was predictive of child IQ, but not behavioral outcomes at age 3 years. We did not find interactive effects as expected based on prior findings (e.g. Thompson et al., 1994) demonstrating that sociodemographic and psychosocial risk factors are stronger predictors of children's behavior and development than infant health risk.

Our findings also suggest that older mothers and mothers of females more successfully fostered secure attachments. Others have indicated that socioeconomically stressed African American mothers of boys may be more likely to have depressive symptomatology and negative perceptions of their child (Jackson, 1995) than African American mothers of girls, suggesting that there may be gender differences in the development of attachment security in high-risk families. Older mothers are also more likely to be emotionally mature, have more life experience, and have greater resources that enable them to sensitively interact with their infants.

### Future Directions and Conclusion

Subsequent investigations examining ecological predictors of attachment security in preterm infants should explore additional sources of risk, including the health of families' overall social ecology (e.g., low social support, marital discord, life stress). In addition, longitudinal studies should examine stability in the relations among risks, maternal sensitivity, and attachment security over time. Low-income families are prone to instability suggesting that risk may vary over time, and such instability may itself prove to be an important factor. The stability of parent-child relations is likely to be contingent on the stability of other life events, including family circumstances and the child's increasing maturity (Thompson, 1999).

Our study is limited to low-income, urban, African American preterm infants-mother dyads. Bakersmans-Kranenburg, et al. (2004) demonstrated that among African-American and white families, the associations between maternal sensitivity and attachment security are consistent, and that poverty indirectly influenced attachment security through maternal sensitivity. Our findings, which address antecedents of attachment among premature infants, add to the literature about the development of attachment in diverse samples. Future studies should examine if linkages among risks, maternal sensitivity, and attachment security are stable across socioeconomic, ethnic, and medical contexts.

Our findings are important to the field of infant mental health. Multi-stressed premature infant-mother dyads may have more difficulty forming healthy attachments than those living in more favorable circumstances, via the negative impact that environmental risk has on parenting quality. Insecure attachments, in turn, place children at risk for socio-emotional difficulties. At present, early intervention programs place strong emphasis on identifying and providing services for children with developmental delay (Council on Children with Disabilities, 2006). Comparatively little emphasis, by contrast, is placed on identifying children at developmental risk because of maternal insensitivity. Our results argue that promoting parenting quality should be an important goal of early intervention, and that early intervention should address the environmental and personal factors that place parenting at risk.

- Ecological and transactional theories link child outcomes to accumulated risk.
- Cumulative psychosocial and sociodemographic risk have been related to attachment security in full-term but not preterm samples.
- Among preterms cumulative risks have been associated with developmental and socioemotional outcomes but not attachment security.
- Maternal sensitivity has been found to mediate the link between risk factors and attachment security.
- Findings demonstrated that psychosocial and sociodemographic negatively related to attachment.



- The influences of proximal and distal risk factors on attachment security were mediated by maternal sensitivity.
- Results emphasize the need for early intervention programs targeting premature infants to identify and address environmental and personal factors that place parenting at risk.

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**Table 1**

## Distributions of risk conditions

Variable	Cut off	N (%)
<b>Health</b>		
GA	≤ 31 weeks	45 (40.2%)
BW	< 1000 grams	33 (29.5%)
Length of Stay	≥ 58 days	29 (25.9%)
<b>Socioeconomic risk</b>		
Poverty Threshold	Below (<1)	41 (36.6%)
Education	No high school diploma	14 (12.5%)
Single parent status	Single/not living with partner	53 (47.3%)
<b>Psychosocial risk</b>		
Maternal Self-efficacy	≤ 34 (lowest quartile)	40 (35.7%)
Depression	≥16 (clinical cutoff)	12 (10.7%)
Parenting Stress	≥ -26 (highest quartile)	23 (20.5%)

GA=Gestational Age, BW=Birthweight

**Table 2**

Frequency distribution of sociodemographic, psychosocial, and infant health risk indices

	<b>Risk Factors</b>	<b>N(%)</b>	<b>Risk Factors</b>	<b>N(%)</b>	<b>Risk Factors</b>	<b>N(%)</b>
	<b>Sociodem risk</b>		<b>Psy risk</b>		<b>Health risk</b>	
0	44(39.3%)	0	59 (52.7%)	0	26 (23.2%)	
1	35(31.2%)	1	33 (29.5%)	1	65 (58.0%)	
2	26(23.2%)	2	18 (16.1%)	2	21 (18.8%)	
3	7(6.2%)	3	2 (1.8%)			

Table 3

Correlations among measures

	AQS	MBQ	Psy	Sociodem	Health	Int Group	Gender	Mat age
<b>MBQ</b>	.52**	–						
<b>Psy</b>	-.20*	-.19*	–					
<b>Sociodem</b>	-.31**	-.26**	.04	–				
<b>Health</b>	-.07	-.06	-.10	.07	–			
<b>Int Group</b>	.13	-.002	.03	.06	.06	–		
<b>Gender</b>	-.19*	-.06	.06	-.12	-.13	.02	–	
<b>Mat age</b>	.27**	.17	.05	.47**	.02	.09	.17	–

\* p ≤ .05,

\*\* p &lt; .01

Psy=psychological risk, Sociodem=sociodemographic risk, Health=health risk, Int Group=Intervention group

**Table 4**

Model examining main effects and maternal sensitivity as a mediator of risk domains on attachment

	<b>R2 change</b>	<b>Beta</b>	<b>P</b>
Step 1	.15		.001
Intervention group		.13	.14
Gender <sup>a</sup>		-.25	.008
Maternal age		.30	.001
Step 2 <sup>b</sup>	.10		.004
Sociodemographic risk		-.26	.01
Psychosocial risk		-.18	.04
Infant health risk		-.12	.18
Step 3	.15		.000
Sociodemographic risk		-.17	.07
Psychosocial risk		-.11	.18
Infant health risk		-.09	.28
Maternal sensitivity		.41	.000

<sup>a</sup>Female=1, Male=2<sup>b</sup>all covariates were retained on all steps of the regressions