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Genetic and caregiving-based contributions to infant attachment: Unique associations with distress reactivity and attachment security

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Abstract

This longitudinal study examined genetic and caregiving contributions to individual differences in infant attachment. Mothers' responsiveness to their 6-month-old infants was rated during naturalistic interactions for 154 mother-infant pairs, and infant attachment organization was classified using the Strange Situation Procedure at 12 and 18 months old. Children were later genotyped with respect to the serotonin transporter linked polymorphic region (5-HTTLPR). Maternal responsiveness uniquely predicted infants' attachment security. Infants' 5-HTTLPR variation uniquely predicted the subtypes of attachment security or insecurity at 12 months as well as the subtype of insecurity at 18 months. The 5-HTTLPR short allele was consistently associated with attachment classifications characterized by higher emotional distress. These findings suggest that infants' 5-HTTLPR variation contributes to infants' emotional reactivity while the history of caregiving quality impacts how effectively infants use their caregiver for emotional regulation. Theoretical implications for the study of genetic and caregiving influences are discussed.

Individual differences in infant attachment are one of the foundations for individuals' social and emotional adjustment across the life course. Infant attachment classifications, as assessed with the Strange Situation Procedure (Ainsworth, Blehar, Waters, & Wall, 1978), predict behavior problems during childhood (Fearon, Bakermans-Kranenburg, van IJzendoorn, Lapsley, & Roisman, 2010), psychopathology symptoms in adolescence (Carlson, 1998), and interpersonal relationship quality across childhood and extending into adulthood (Berlin, Cassidy, & Appleyard, 2008). Although these associations are at times contingent upon subsequent developmental experiences (e.g., Salvatore, Kuo, Steele, Simpson, & Collins, 2011), infant attachment classifications nonetheless mark the initiation of developmental trajectories that probabilistically lead to differences in socioemotional functioning. As such, it is important to understand the factors that contribute to variations in infant attachment.

Two contrasting explanations have been proposed for accounting for individual differences in infant attachment. Attachment theory conceptualizes infant attachment variations as differences in the quality – or security – of the infant-caregiver attachment relationship. As

such, attachment theory emphasizes the history of infant-caregiver interactions for the promotion of a secure attachment, namely the caregiver's responsiveness to the infants' signals (Ainsworth et al., 1978; Bowlby, 1982; Sroufe, 1985). Others have conceptualized infant attachment classifications as a reflection of infants' temperament, or biologically based predispositions for negative emotionality (Goldsmith & Alansky, 1987; Kagan, 1982). Debates involving the relative contribution of infant temperament and caregiver responsiveness have continued for decades, and questions and controversies still remain (Kagan, 2011; Sroufe & Siegel, 2011).

One fundamental – and often overlooked – difference between these two perspectives is their respective emphases on emotional reactivity versus emotional regulation. While the temperament perspective focuses on individual differences in infants' emotional reactions to contextual stimuli, attachment researchers emphasize how infants use their caregiver to regulate their emotional arousal (Sroufe, 1985). During the Strange Situation Procedure, the standard measure of infant attachment, infants' responses to a series of separations and reunions with their caregiver are observed. Attachment security is demonstrated by an infant's capacity to use the caregiver to effectively regulate his or her emotional arousal during this moderately stressful task. Although infants' distress levels to this procedure are highly variable, distress is not a criterion for attachment security. In fact, the two most common patterns of insecure attachment show markedly different distress profiles. Insecure-avoidant infants display minimal distress during caregiver separations, whereas insecure-resistant infants are highly upset.

Variability in distress reactivity is also observed among the subtypes of securely attached infants. A portion of securely attached infants display minimal distress (denoted with subcategory of B₁ or B₂), with levels comparable to those of insecure-avoidant infants. Other securely attached infants (denoted with subcategory of B₃ or B₄) are as distressed as insecure-resistant infants (Frodi & Thompson, 1985). The distinguishing feature for these securely attached infants is their ability to effectively use their caregiver to regulate their distress, however intense it may be. As such, securely-attached B₁ and B₂ infants show delight and are active in reengaging with the caregiver during reunions, while insecure-avoidant infants actively avoid interaction with their caregiver. Similarly, securely-attached B₃ and B₄ infants intentionally seek out and are soothed by their caregiver, while insecure-resistant infants are inconsolable and show a marked ambivalence towards their caregiver (Ainsworth et al., 1978).

One proposed reconciliation between the temperament and attachment perspectives is that infants' distress reactivity, but not attachment security, during the Strange Situation Procedure is shaped by infants' biologically based patterns for negative emotionality (Belsky & Rovine, 1987; Sroufe, 1985). In an initial test of this hypothesis, Belsky and Rovine (1987) grouped infants according to their distress reactivity to the Strange Situation Procedure. The high distress category comprised securely-attached B₃/B₄ and insecure-resistant infants, while the low distress category included securely-attached B₁/B₂ and insecure-avoidant infants. Using this alternative classification system, it was reported that distress reactivity grouping was predicted by measures of early infant temperament. Infants in the high distress category showed less autonomic stability as newborns and were rated by

their mothers as being more difficult. However, these measures of early temperament failed to distinguish between securely and insecurely attached infants. This unique association between infant temperament and distress reactivity grouping underscored the distinctiveness between emotional reactivity and regulation during the Strange Situation Procedure and implied that there are unique pathways to each of these attachment behavioral outcomes.

Subsequent attempts to empirically evaluate this hypothesis have yielded mixed results. Whereas a number of investigations have noted unique, positive associations between early measures of infants' temperament and infants' distress reactivity during the Strange Situation Procedure, these associations have not been uniformly found (Vaughn, Bost, & van IJzendoorn, 2008). One likely explanation for this lack of consistency is the complexity of measuring infants' biologically based emotional tendencies using traditional approaches (Kochanska & Coy, 2002; Marshall & Fox, 2005; Rothbart & Bates, 2006). Moreover, the nature and timing of infant temperament assessments have varied across these studies (Vaughn et al., 2008). Due to these methodological constraints, it is challenging to evaluate the extant empirical evidence for this hypothesis.

Molecular genetic analyses afford a more direct and objective examination of the potential biological contributions to infant distress reactivity. In particular, the serotonin transporter gene (*SLC6A4*) contains a common variation (5-HTTLPR) which has been linked to individual differences in negative emotionality (Caspi, Hariri, Holmes, Uher, & Moffitt, 2010). The 5-HTTLPR polymorphism is characterized by a 44 base-pair insertion/deletion in the promoter region of the gene (Lesch et al., 1996). The short (S) allele is associated with diminished gene transcription, lower transporter levels, reduced serotonin uptake, and increased activation of the amygdala while processing emotional stimuli (Caspi et al., 2010; Hariri et al., 2002; Lesch et al., 1996). At the behavioral level, the S allele is also associated with a heightened risk for negative affect and emotional disorders in adults (Clarke, Flint, Attwood, & Munafo, 2010; Sen, Burmeister, & Ghosh, 2004) and negative emotionality in infants (Auerbach et al., 1999). Recent investigations have identified an additional A/G single nucleotide polymorphism in the long allele (denoted as L_G; rs25531), which results in lower gene expression levels that are comparable to the S allele (Hu et al., 2005). Examination of the triallelic (S, L_G, L_A) genotype may provide a more accurate picture of the consequences of 5-HTTLPR variation.

The purpose of this longitudinal study was to examine the genetic and caregiving contributions to individual differences in infants' attachment classifications. We predicted there would be unique associations for caregiving quality and for infants' genetic variation. Specifically, we hypothesized that infants' attachment security would be predicted by the history of maternal responsiveness. Second, we expected that infants' 5-HTTLPR variation would predict the subtype of security or insecurity, such that the short allele (or L_G equivalent) would be associated with classifications marked by higher distress reactivity during the Strange Situation Procedure. Potential gene-by-environment interactions were also examined in light of recent interest in the interplay between caregiving quality and infants' 5-HTTLPR variation (Barry, Kochanska, & Philibert, 2008; Spangler, Johann, Ronai, & Zimmermann, 2009). Since the available evidence is mixed (e.g., Luijk et al., 2011), these analyses were considered exploratory.

Method

Participants

Participants were a subsample of 155 infants (81 females) and primiparous mothers drawn from a larger longitudinal study ($N = 267$; Sroufe, Egeland, Carlson, & Collins, 2005). This subsample represents individuals from whom genetic information was available. This subsample did not systematically differ from the original sample with respect to sociodemographic risk or focal variables (see supplemental material for attrition analyses). At the time of recruitment, all mothers were below the poverty line and receiving public assistance through the Minneapolis Health Department between 1975 and 1977. At the time of delivery, the mothers ranged in age from 15 to 34 years ($M = 20.8$, $SD = 3.8$) and 63% of the mothers were single. Sixty-seven percent of the infants were Caucasian, 20% were multiracial, 9% were African-American, 3% were Native American, and less than 1% were Hispanic or Asian American.

Measures

Maternal responsiveness—When the infants were six months old, mother-infant interactions were observed in the home on two different days. Interactions consisted of two, 30-minute feeding situations and one 20-minute play situation. During each of these interactions, maternal behaviors were rated using Ainsworth's global scales of maternal sensitivity and cooperation (Ainsworth et al., 1978). The sensitivity vs. insensitivity scale assessed the mothers' ability to perceive and accurately interpret the infant's signals as well as respond appropriately and promptly. High scores represent keen attunement to the infant's cues and timely, contingent responsiveness, while low scores represent a lack of awareness or ignoring of the infant's signals. The cooperation vs. interference scale assessed the extent to which mothers synchronized their behaviors with the infant's current mood and interests. High scores were given to mothers who respected the infant's autonomy by coordinating their own desires and responsibilities with the infants' activities. Low scores were given to mothers who engaged in severe and/or frequent behaviors that interfered with the infants' activities or interests.

For both scales, agreement among independent coders was calculated using the Lawlis-Lu χ^2 (Tinsley & Weiss, 1975), with agreement defined as a discrepancy of 2 points or less for these 9-point scales. There was significant agreement for all ratings ($p < .05$), with t -values ranging from 0.66 to 0.87. This indicates that interrater agreement for both scales was moderate to high. The sensitivity and cooperation measures during the feeding and play interactions were combined to form a composite measure of maternal responsiveness ($\alpha = .93$, $M = 5.67$, $SD = 1.47$). Maternal responsiveness information was not available for 6 participants.

Infant attachment classifications—The organization of infants' attachment behaviors was assessed twice, at 12 and 18 months, using Ainsworth's Strange Situation Procedure (Ainsworth et al. 1978). During this laboratory procedure, infants' responses to a series of mildly stressful separations and reunions with their mothers were observed. The traditional system was used to classify infants according to the organized patterns of securely attached

(B), insecure-avoidant (A), or insecure-resistant (C). Although the attachment disorganization/disorientation classification has more recently been added to Ainsworth's original classification system, attachment security and disorganization/disorientation represent theoretically and empirically unique infant attachment outcomes (see Luijk et al., 2011). Since our hypotheses focused on types of attachment security or insecurity, the disorganization/disorientation classification was not included in the current study.

The attachment assessments at 12 and 18 months were coded by independent teams with high interrater agreement for both assessments (89% and 93% respectively). Any disagreements were resolved through conferencing. At the 12-month assessment, there were 88 B's, 36 A's, and 23 C's. At 18-months, the distribution was 88 B's, 32 A's, and 20 C's. Infant attachment information was not available for 8 infants at 12 months and 15 infants at 18 months. There was significant stability in attachment security from 12 to 18 months ($\kappa = .34, p < .001$). Continuity in attachment security was not significantly related to distress reactivity grouping at either 12 or 18 months.

Infants were also categorized according to their level of emotional distress to the Strange Situation Procedure using a previously established procedure (e.g., Belsky & Rovine, 1987). Securely-attached infants with a sub-classification of B₁ or B₂ ($n = 50$ at 12m; $n = 47$ at 18m) were grouped with insecure-avoidant infants to represent infants who displayed low-distress. Securely-attached infants with a sub-classification of B₃ or B₄ ($n = 38$ at 12m; $n = 41$ at 18m) were combined with insecure-resistant infants to form a high-distress category. There was significant stability in distress reactivity groupings from 12 to 18 months ($\kappa = .18, p = .04$). Continuity in distress reactivity was not significantly related to attachment security at either 12 or 18 months.

5-HTTLPR variation—In a follow-up assessment with the participants at age 32 years, 156 participants provided buccal cells for DNA analysis. Using the conventional method, DNA was extracted with the Epicentre BuccalAmp DNA Extraction Kit to prepare DNA for PCR amplification. Genotyping was conducted following previously published protocols (Cicchetti, Rogosch, & Toth, 2011). All samples were genotyped in duplicate for quality control. Genetic information from one participant was unable to be genotyped. The distribution of participant genotypes was 43 L_A / L_A, 12 L_A / L_G, 1 L_G / L_G, 61 S / L_A, 7 S / L_G, and 31 S / S. The 5-HTTLPR triallelic genotype was in the Hardy-Weinberg equilibrium, $\chi^2(3) = 1.47, p = .39$. Because the L_G and S alleles are functionally equivalent in genetic expression (Hu et al., 2005), they were grouped together as S'. The L_A allele was designated as L'. Using this categorization, 43 individuals (27.7%) were in the L' / L' group, 73 (47.1%) were in the S' / L' group, and 39 (25.2%) were in the S' / S' group.

Missing Data

Observations of maternal responsiveness and infants' attachment classifications were not available for all individuals who provided DNA information. These individuals with missing data did not significantly differ with regard to demographic variables. These data were assumed to be missing at random (Schafer & Graham, 2002). Following best practices, multiple imputation for missing data was carried out using Bayesian estimation (Schafer &

Graham, 2002). Data were imputed 10 times, with results of analyses on the 10 datasets combined according to Rubin's Rules (Rubin, 1987). One maternal responsiveness score was an extreme outlier (over 3 *SD*) and was removed prior to analyses (final *N* = 154).

Analysis Plan

The primary analytic approach involved estimating a series of logistic regression models in which measures of infants' attachment security and distress reactivity during the Strange Situation Procedure were separately regressed on maternal responsiveness rated from 6-month interactions, the infants' 5-HTTLPR genotype (representing the number of *S'* alleles), and their statistical interaction. Separate logistic regression analyses were conducted for each age period. Sex and ethnicity were included as controls in all models to correct for potential confounds due to population stratification and sex differences. Odds ratios (OR) are reported in the text as measures of effect size, while unstandardized coefficients are summarized in Tables 1 and 2. With significance levels of .05 and power of .80, we were able to detect caregiving effect sizes of approximately 1.25, genetic effect sizes of approximately 2.0, and GxE interaction effect sizes of approximately 1.75 (QUANTO 1.2.4 software, <http://hydra.usc.edu/GxE>).

Results

Before examining gene-environment contributions to infant attachment classifications, the presence of a gene-environment correlation was evaluated. Maternal responsiveness during the 6-month interactions did not differ across the infants' genotype ($\beta = -.08$, $p > .10$).

Predicting Infants' Attachment Security

Analyses predicting infants' attachment security vs. insecurity at 12 months were first conducted. Greater maternal responsiveness during the six-month interactions predicted an increased likelihood of being securely attached at 12 months: Odds Ratio (OR) = 1.42, $p < .01$ (see Table 1). Neither infants' 5-HTTLPR variation nor the interaction between 5-HTTLPR and maternal responsiveness were significant predictors of infants' attachment security. Further tests evaluated whether maternal sensitivity predicted attachment security for both high distress and low distress reactivity groups. When only high-reactive (C, B₃/B₄) infants were considered, maternal responsiveness did not significantly differentiate between securely attached and insecure-resistant infants: OR = 1.27, $p > .10$. However, when only low-reactive (A, B₁/B₂) infants were considered, greater maternal responsiveness significantly predicted a greater likelihood of being securely attached: OR = 1.54, $p = .01$.

When predicting attachment security at 18 months, maternal responsiveness during the six-month interactions was a marginally significant predictor of attachment security: OR = 1.23, $p = .09$. Neither infants' 5-HTTLPR variation nor the interaction between 5-HTTLPR and maternal responsiveness were significant predictors of infants' attachment security. When subtypes were considered separately, maternal responsiveness significantly predicted attachment security for high-reactive (C, B₃/B₄) infants (OR = 1.50, $p = .05$) but not for low distress (A, B₁/B₂) infants (OR = 1.03, $p > .10$).

Predicting Infants' Distress Reactivity

The second set of analyses predicted infants' distress reactivity during the Strange Situation Procedure. Analyses of the 12 month reactivity groupings revealed that infants' 5-HTTLPR variation was the only significant predictor of infants' distress reactivity: $OR = 2.04$, $p < .01$ (see Table 2). An S' allele was associated with a two-fold increase in the probability of high distress reactivity during the 12-month Strange Situation. Neither maternal responsiveness nor the interaction between 5-HTTLPR and maternal responsiveness were significant predictors of infants' distress reactivity. Further tests evaluated whether this association between 5-HTTLPR and distress reactivity applied for both securely and insecurely attached infants. Among securely attached infants, 5-HTTLPR variation continued to predict high distress classifications of B_3/B_4 : $OR = 2.13$, $p = .02$. An S' allele continued to be associated with approximately a two-fold increase in the likelihood of high distress reactivity. Due to the low number of insecurely-attached infants with two S' alleles at 12-months, infants with at least one S' allele (S'/S' or S'/L') were considered together. Among insecurely attached infants, the S' allele predicted the insecure-resistant classification: $OR = 4.01$, $p = .05$. The odds ratio indicated that an S' allele predicted a four-fold increase in the probability of being classified as insecure-resistant versus insecure-avoidant at 12 months.

When Strange Situation classifications at 18 months were examined, infants' distress reactivity was not significantly associated with 5-HTTLPR variation ($OR = 1.21$, $p > .10$). Neither maternal responsiveness nor the interaction between 5-HTTLPR and maternal responsiveness were significant predictors of infants' distress reactivity at 18 months. However, follow-up tests indicated 5-HTTLPR marginally predicted reactivity among insecurely-attached infants: $OR = 1.99$, $p = .08$. This association was considered significant since it was a two-tailed test of our directional hypothesis. Moreover, the odds ratio indicated that an S' allele was associated with approximately a two-fold increase in the likelihood of being classified as insecure-resistant versus insecure-avoidant during the 18-month Strange Situation Procedure. Infants' 5-HTTLPR genotype was not associated with distress reactivity for securely-attached infants ($OR = 0.80$).

Discussion

The results of this longitudinal study are consistent with our hypotheses about genetic and caregiving contributions to infant attachment classifications. At 12 months of age, infants' 5-HTTLPR variation predicted how distressed they became during the moderately stressful Strange Situation Procedure, while the history of infant-caregiver interactions predicted how effectively infants used their caregiver to regulate their distress. These associations generally replicated when infants were 18-months-old, although genetic influences on distress reactivity were only observed for insecurely attached infants. These findings underscore the distinctiveness between emotional reactivity and emotion regulation during the Strange Situation Procedure and provide evidence for unique developmental pathways to each of these outcomes in early infancy.

These findings support attachment theory's central hypothesis that infant attachment security reflects the history of infant-caregiver interactions (Ainsworth et al., 1978; Bowlby, 1982; Sroufe, 1985). Infants who experience sensitive and cooperative care are hypothesized to

form perceptions of their caregiver as available and responsive to their needs, which enables infants to use their caregiver for effective emotion regulation. Our findings provide continued support for this idea, for infants' attachment security at both 12 and 18 months was predicted by a history of maternal responsiveness. Although the associations for specific subgroups were not always statistically significant, this may reflect Type II error resulting from the smaller sample sizes. Furthermore, a positive direction of effect was consistently observed. Numerous observational and experimental investigations have provided additional support for this hypothesis (Cicchetti et al., 2011; de Wolff & van IJzendoorn, 1997; NICHD Early Child Care Research Network, 1997). Moreover, several behavioral genetics investigations have reported large shared environment and trivial genetic contributions to infant attachment security (Bakermans-Kranenburg, van IJzendoorn, Bokhorst, & Schuengel, 2004; Fearon et al., 2006; Roisman & Fraley, 2008).

Although 5-HTTLPR variation was unrelated to infant attachment security, it did predict the type of security or insecurity. More specifically, the 5-HTTLPR short allele was associated with attachment classifications characterized by higher distress reactivity during the Strange Situation Procedure. Securely attached 12-month-old infants who became highly distressed but effectively used the caregiver for comfort (B3/B4) carried the 5-HTTLPR short allele more often than securely attached infants who showed minimal distress and active enjoyment of the caregiver (B1/B2). Infants' 5-HTTLPR variation also discriminated between types of insecure attachment at both ages. Infants who became inconsolably distressed during the Strange Situation (i.e., insecure-resistant) carried the 5-HTTLPR short allele more often than infants who displayed minimal distress and avoided interactions with their caregiver (insecure-avoidant). Although these findings appear to contradict the hypothesis that the insecure-avoidant and insecure-resistant classifications reflect specific infant-caregiver interaction histories, more fine-grained measures of the specific types of low maternal responsiveness (e.g., rejection and inconsistency) are needed to thoroughly evaluate this hypothesis. These results do indicate that infants' 5-HTTLPR variation biases an insecure attachment in the direction of either avoidance or resistance by contributing to differences in emotional reactivity inherent to these two patterns of attachment insecurity (Belsky & Rovine, 1987).

There was limited evidence of gene-environment interplay in our study. First, there was an absence of a gene-environment correlation, for infants' 5-HTTLPR variation was not associated with the quality of maternal responsiveness (Fearon et al., 2006; Roisman & Fraley, 2008). There also was no evidence of statistical interactions between maternal responsiveness and infants' 5-HTTLPR variation for either infant attachment security or distress reactivity. While infant genetic variation and caregiving quality both played a role in shaping attachment behavior, they did so independently of one another. The lack of a gene-environment interaction when predicting attachment security further underscores the centrality of the parent-child relationship as the basis of attachment security (e.g., Luijk et al., 2011). However, studies with nonhuman primates and studies with older children have demonstrated that an unsupportive caregiving context may exacerbate 5-HTTLPR's influence on negative affect (Fox et al., 2005; Suomi, 2004). In our sample, the genetic associations with emotional reactivity for securely attached infants at 12, but not 18 months,

may suggest that genetic influences on distress reactivity are conditional on the quality of the infant-caregiver relationship as well as the development of the child (Sroufe, 1985).

Although a handful of previous studies have investigated molecular genetic contributions to infant attachment variation (Barry et al., 2008; Cicchetti et al., 2011; Luijk et al., 2011; Spangler et al., 2009), the present study represents an innovative approach to the question by emphasizing individual differences in distress reactivity inherent in subtypes of attachment security and insecurity. The use of attachment subtypes may assist in clarifying the mixed evidence regarding the association between infants' 5-HTTLPR variation and attachment security (Luijk et al., 2011). One important task for future research will be to replicate these findings with more direct measures of infant distress during the Strange Situation. The current findings build on prior investigations of infant attachment and temperament (Marshall & Fox, 2005; Vaughn et al., 2008), as well as behavioral genetic studies reporting differential heritability estimates for infant-caregiver relationship quality and infant temperament (Bakermans-Kranenburg et al., 2004; Roisman & Fraley, 2006). Finally, these findings also contribute to the growing evidence for the association between 5-HTTLPR and negative emotionality in early infancy (Auerbach et al., 1999; Caspi et al., 2010).

These findings indicate there are unique roles for the caregiving context and infants' genetic variation for explaining individual differences in infant attachment behavior. A history of responsive caregiving influenced whether or not the attachment relationship became secure or insecure, and the infants' 5-HTTLPR variation shaped how this security or insecurity was manifested. A fruitful perspective for future investigations of infant attachment would be to combine measures of the caregiving context with genetic variables, not because either has a privileged status or would independently provide a superior explanation, but because their combination would yield a more comprehensive understanding of the nature and origins of individual differences in infant attachment.

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Table 1
Regression Analyses Predicting Infant Attachment Security during the Strange Situation Procedure at 12 and 18 months.

	12 months				18 months			
	Total sample		High Distress		Total sample		High Distress	
	<i>B</i> (<i>SE</i>)		<i>B</i> (<i>SE</i>)	<i>B</i> (<i>SE</i>)	<i>B</i> (<i>SE</i>)		<i>B</i> (<i>SE</i>)	<i>B</i> (<i>SE</i>)
5-HTTLPR	.01 (.25)		.18 (.41)	.01 (.35)	.15 (.26)		-.31 (.40)	.60 (.38)
Maternal Responsiveness	.35 (.13) **		.24 (.20)	.43 (.17) *	.21 (.13) +		.41 (.21) *	.03 (.18)
5-HTTLPR x Responsiveness	-.07 (.17)		-.01 (.28)	-.10 (.25)	-.10 (.17)		-.33 (.31)	.02 (.24)

Note:

+ *p* .10,

* *p* .05,

** *p* .01.

Table 2

Regression Analyses Predicting Infant Distress Reactivity during the Strange Situation Procedure at 12 and 18 months.

	12 months				18 months			
	<u>Total sample</u>		<u>Secure</u>		<u>Insecure</u>		<u>Total sample</u>	
	<i>B</i>	(<i>SE</i>)	<i>B</i>	(<i>SE</i>)	<i>B</i>	(<i>SE</i>)	<i>B</i>	(<i>SE</i>)
5-HTTLPR	.71	(.25) ^{**}	.76	(.34) [*]	1.49	(.76) [*]	.08	(.25)
Maternal Responsiveness	.07	(.12)	.03	(.15)	.18	(.22)	.19	(.12)
5-HTTLPR x Responsiveness	.06	(.16)	.09	(.21)	.04	(.52)	.12	(.17)
							.05	(.21)
							.71	(.46)

Note:

⁺ *p* .10,

^{*} *p* .05,

^{**} *p* .01.