

## Links Between Mothers' Coping Styles, Toddler Reactivity, and Sensitivity to Toddler's Negative Emotions

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### **Abstract:**

The extent to which engaged maternal coping styles moderate the association between toddler's temperamental reactivity and mothers' sensitivity to children's negative emotions was examined in 89 mother-child dyads. Primiparous mothers completed a measure of coping styles prenatally. When toddlers were 16 months old, mothers completed a measure of perceived toddler temperament and a self-report of how they respond to toddler negative emotions, and maternal sensitivity and temperamental reactivity were observed during emotionally arousing tasks in the laboratory. Mothers' disengaged coping style was positively associated with self-reported insensitive responses to children's negative emotions. Engaged coping moderated the association between toddler temperamental reactivity and both self-reported insensitive responses and observed maternal sensitivity, such that temperamental reactivity was more strongly linked with less sensitive maternal behavior when engaged coping was low.

**Keywords:** Maternal coping | Toddler temperament | Maternal sensitivity

### **Article:**

Maternal sensitivity to children's negative emotions is associated with adaptive child outcomes such as attachment security, social competence, better affect regulation, and fewer behavioral problems (Davidov and Grusec, 2006, Leerkes et al., 2009 and McElwain and Booth-LaForce, 2006). Yet, relatively little is known about the factors that promote mothers' ability to respond sensitively to children's negative emotions. Given evidence that children's negative emotions are a salient stressor for mothers (Belsky, 1984) and that individual differences in the frequency and intensity of toddler negative emotions (i.e., temperament) likely contribute to variability in the magnitude of this stressor (Rothbart & Bates, 1998), it seems likely that how mothers cope with

stress and toddler's temperamental reactivity may be important predictors of how mothers respond to their toddler's negative emotions.

### 1. Maternal sensitivity to negative emotions and child outcomes

Maternal sensitivity refers to mothers' timely and appropriate responses to their children's cues with respect to their developmental level and the demands of the situation (Ainsworth, Blehar, Waters, & Wall, 1978). Maternal sensitivity is important because it fosters children's adaptive social and emotional outcomes (Denham and Grout, 1993 and Fabes et al., 2001). Specifically, sensitivity to children's negative emotions is associated with children's subsequent ability to be more sympathetic, empathetic, and prosocially responsive (Davidov & Grusec, 2006). Children whose mothers respond sensitively to their negative emotions have an easier time forming peer relationships during preschool and adolescence (Denham, Mitchell-Copeland, Strandberg, Aurebach, & Blair, 1997) and are more likely to have secure attachments (McElwain & Booth-LaForce, 2006). Mothers who are sensitive in their responses to their children's negative emotions teach their children that their emotions are valid and should be acknowledged, which allows them the opportunity to experience negative emotions in an environment where they are supported and can learn to cope with difficult situations and feelings (Fabes et al., 2001). Alternatively, mothers who dismiss, minimize, or act punitively toward their children's negative emotions convey a negative message about emotions and do not provide the supportive context that promotes children's understanding, acceptance, and regulation of difficult emotions (Dix, 1991, Gottman et al., 1996 and Gottman et al., 1997), which can undermine children's development. Insensitive responses to children's negative emotions contribute to children's minimization and masking of their own emotions, negative beliefs about their social environment, and maladaptive regulatory skills (Calkins, 1994 and Cassidy, 1994). Thus, identifying the factors that promote sensitive responding to children's negative emotions is of critical importance. We turn first to the potential role of mothers' coping styles.

### 2. Links between maternal coping and responsiveness to children's negative emotions

Parenting is an inherently stressful process that occurs within an affective context (Dix, 1991). When toddlers behave in ways that are not congruent with mothers' goals and expectations, negative emotions are likely to occur, and this can create stress for mothers. How mothers cope with this stress is important for the affective context in which the mother-toddler relationship develops and evidence that how mothers think and feel about emotions are an important predictor of their behavior (Dix, 1991) suggests that how mothers cope with their own emotions may predict how they respond to their children's emotions.

Coping with stress is a transactional, dynamic process. Generally, coping is thought of as how people handle situations, what people do to eliminate stress, and how they manage emotions associated with stress (Lazarus and Folkman, 1984, Lazarus and Folkman, 1987, Roth and Cohen, 1986 and Skinner and Edge, 1998). Although there are different conceptualizations of

coping styles, one useful distinction has been the extent to which individuals actively attempt to solve problems and cope with affiliated emotions, referred to as engaged or problem-focused coping; versus the extent to which individuals attempt to avoid problems and affiliated emotions, referred to as disengaged or avoidant coping (Lazarus and Folkman, 1984, Lazarus and Folkman, 1987, Roth and Cohen, 1986 and Stanton et al., 2000).

Mothers with an engaged coping style may feel less distressed by crying and approach it as a problem that they can solve, promoting sensitive responses to their children's negative emotions. These mothers may also value emotions and emotional problem solving and deliberately attempt to instill such values in their young children by helping them to cope proactively with their own emotions. In contrast, mothers with a disengaged coping style may be more distressed by their children's negative emotions and either withdraw or respond harshly in an effort to minimize their contact with the stressor, which can undermine sensitivity. Consistent with this view, parents who report valuing and dealing effectively with their own negative emotions tend to also value their children's emotions and have been observed to be more responsive to their children than parents with alternative beliefs about emotions (Gottman et al., 1996 and Yap et al., 2008). Moreover, mothers' problem-focused coping was associated with engaging in more affiliative behaviors like play and affection during their infants' first year of life in a sample of primiparous mothers (Levy-Shiff, Dimitrovsky, Shulman, & Har-Even, 1998).

### 3. The role of child temperament

Child reactivity has also been linked with sensitivity in early childhood. Reactivity is defined as a temperamental characteristic typically indicated by the frequency and intensity of vocal, facial, motor, and physiological indices of stress (Rothbart & Bates, 1998). Infants who display distress intensely or frequently may be more difficult to care for as evidenced by greater parenting stress (Belsky, 1984) and more negative parental emotions (Crockenberg and Leerkes, 2003 and Dix, 1991) among parents of reactive infants. However, links between temperament and parenting have been mixed (Paulussen-Hoogeboom, Stams, Hermanns, & Peetsma, 2007). In some instances mothers of temperamentally reactive infants were less sensitive as evidenced by less displayed positive emotion or physical contact with their infants than was typical of mothers of less reactive infants (Calkins et al., 2004 and van den Boom and Hoeksma, 1994). In other instances, temperamental reactivity has been unrelated to parenting or positively related (Hagekull, Bohlin, & Rydell, 1997). These inconsistencies prompted Crockenberg (Crockenberg, 1986 and Crockenberg and Leerkes, 2003) to argue that the association between temperament and parenting is moderated by other factors. Specifically, temperament may only be linked with less sensitive maternal behavior when resources are low (e.g., low social support) or other stressors are present (e.g., depression). An engaged maternal coping style is another factor that could moderate this relationship. An engaged coping style is a psychological resource that may buffer mothers from the negative effect of temperamental reactivity on sensitivity. Mothers with an engaged coping style may be able to remain calm and sensitive in the face of intense and frequent toddler negative emotions; whereas mothers with a disengaged coping style may

become distressed themselves by their temperamentally reactive children, prompting them to respond insensitively to their children's negative emotions.

In sum, in this study we hypothesize that engaged coping styles will be positively associated with mothers' sensitive responsiveness to their children's negative emotions and disengaged coping will be negatively associated with sensitive responsiveness. We also hypothesize that maternal coping styles will moderate the relationship between toddler's temperamental reactivity and sensitive responsiveness to children's negative emotions, such that temperamental reactivity will only be linked with insensitive maternal responses when engaged coping is low or disengaged coping is high.

## 4. Method

### 4.1. Participants

Eighty-nine primiparous mothers participated in a follow-up study from a larger longitudinal sample ( $N = 118$ ) when children were 16 months old. At the follow-up, significantly more minorities dropped out of the study than European-Americans,  $\chi^2(1, N = 118) = 4.29, p < .05$ . In the final sample, maternal age ranged from 17 to 38 ( $M = 28.3$ ) and the majority were European-American (81%) or African-American (15%). Ninety-seven percent of the mothers were married to, living with, or dating the child's father; 3% were single mothers. Seventy percent of mothers had a 4-year degree or higher and annual income ranged from \$10,000 to \$150,000 with a median income of \$65,000. Forty-nine of the children were male.

### 4.2. Procedure

Mothers were recruited by research assistants from child birth classes offered at a local hospital and the Public Health Department. Mothers who agreed to participate were mailed a consent form, demographic questionnaire, and the Ways of Coping Questionnaire (Folkman & Lazarus, 1985) approximately 4-6 weeks prior to their due date. Mothers received a \$15 gift card for completing this phase of the study.

Mothers were re-contacted by phone and invited to participate in a follow-up study when their children were 16 months old. Prior to the 16-month laboratory visit, participants were mailed a consent form, an updated demographic questionnaire, the Toddler Behavior Assessment Questionnaire (Goldsmith, 1996), and the Coping with Toddlers' Negative Emotions Scale (Spinrad, Eisenberg, Kupfer, Gaertner, & Michalik, 2004) to be completed and returned at the visit. During the laboratory visit, the research team conducted two 4-min emotion eliciting tasks (i.e., anger and fear). Mothers were seated on a couch and asked not to interact with their children for the first minute of each task; then upon the cue of the researcher, mothers were instructed that they could interact with their children however they wished. Children were seated on a rug on the floor, and a basket of toys was available within mothers' and children's reach. If at any time during the tasks, a child became extremely upset for one full minute, or if the mother

requested, the research assistant stopped the task. Mothers received a \$25 gift card for completing this phase of the study.

#### 4.2.1. Limitation task

The researcher took out a toy phone that made noise and lit up, and offered it to the child. Once the child was interested in the phone, the researcher took it from the child and placed it in a clear plastic jar (the phone was still making noise and lighting up) and closed the lid tightly so it was impossible for the child to open. The jar was placed on the floor near the child. The researcher encouraged the child to open the jar with verbal prompts (“It’s for you! Answer the phone!”). The mother was asked not to interact with the child for the first minute, unless she wanted to end the activity. After 1 min, upon the cue of the researcher, the mother was instructed she could interact with her child however she wished, as long as she did not open the jar for the child. After a total of 4 min (3 min with the mother involved, 1 min with the mother uninvolved), the researcher opened the jar and allowed the child to play with the phone prior to beginning the next task.

#### 4.2.2. Novelty task

A research assistant dressed in a green robe, a green monster face mask, and wearing large green plastic monster hands entered the room and stood quietly at the door for 10 s. The research assistant spoke a script (“Hello, [child]···I’m an ogre···what are you doing [child]”, etc.) in a neutral voice as she approached the child. After 1 min, the mother was cued that she could interact with her child however she normally would. The masked researcher approached the child within 2 feet, crouched down and repeated the script. The researcher then crossed the room, did a short dance while humming a familiar nursery rhyme, and then slouched in a chair pretending to sleep while snoring loudly. The researcher pretended to wake up suddenly and approached the child again, crouching down next to the child and repeating the script until the other assistant indicated it was the end of the task; the task was a total of 4 min (3 min with the mother involved, 1 min with the mother uninvolved).

### 4.3. Measures

#### 4.3.1. Maternal coping styles

Mothers completed the Ways of Coping Questionnaire (Folkman & Lazarus, 1985) during the prenatal period by rating the extent to which they used particular strategies to handle a recently encountered difficult situation on a scale from 0 (not used/does not apply) to 3 (used a great deal). An engaged coping style refers to the extent to which mothers use active efforts to solve the problem, get help, or make self feel better and included items from the confrontive coping, seeking social support, and problem solving subscales (18 items;  $\alpha = .84$ ). A disengaged coping style refers to mothers attempts to distance, avoid, or minimize the stressor and associated

negative emotions and included items from the distancing and escape-avoidance subscales (14 items;  $\alpha = .80$ ).

#### 4.3.2. Mother reported child reactivity

Mothers completed the Toddler Behavior Assessment Questionnaire (Goldsmith, 1996) at 16 months postpartum by rating the frequency of child behaviors in response to particular situations on a scale from 1 (never) to 7 (always). Items from the fear (10 items) and anger (11 items) subscales were averaged to derive a single measure of mother reported toddler temperamental reactivity ( $\alpha = .85$ ). The TBAQ has demonstrated convergent validity with other widely used toddler temperament questionnaires and across mother and teacher reports (Goldsmith, Rieser-Danner, & Briggs, 1991).

#### 4.3.3. Mother reported sensitivity

Mothers completed the Coping with Toddlers Negative Emotions Scale (Spinrad et al., 2004) at 16 months postpartum by rating the extent to which they used different strategies to respond to their toddlers' negative emotions in 12 hypothetical situations on a scale from 1 (never) to 7 (always). Following procedures used by Spinrad et al. (2007), items from the expressive encouragement, emotion-focused, and problem-focused subscales were averaged to create a measure of sensitive responsiveness (35 items;  $\alpha = .90$ ) and items from the distress and punitive/minimization subscales were averaged to create a measure of insensitive responsiveness (36 items;  $\alpha = .84$ ). In prior research these scores have correlated with observed maternal behavior and predicted children's subsequent externalizing behavior and social functioning, demonstrating the validity of this parenting self-report (Spinrad et al., 2007).

#### 4.3.4. Observational coding

Child temperamental reactivity and maternal behavior were coded during the two emotion-eliciting situations (i.e., anger and fear). Mother and child behaviors were coded continuously using event-based coding from digital media files using the Observer Video Pro 5.0 (Noldus Information Technology, Wageningen, The Netherlands). Coders blind to the hypotheses were trained to achieve adequate reliability; additionally, different people coded child and maternal behavior to ensure independence.

#### 4.3.5. Observed child reactivity

Reactivity was rated by the trained coders based on children's vocalizations, facial expressions, and body tension on a 7-point Likert scale ranging from 1 (high positive affect) to 7 (high negative affect), adapted from Braungart-Rieker and Stifter (1996). Inter-rater reliability was based on 33 tapes; weighted  $k = .79$ . The average rating of child reactivity across the novelty and limitation task was calculated as a measure of observed temperamental reactivity. Observed reactivity correlated positively with maternal reported reactivity,  $r(87) = .28, p < .01$ . Thus, a

multi-method composite variable was created by standardizing and averaging observed and maternal reported measures of toddler reactivity to obtain the most reliable measure of children's temperament.

#### 4.3.6. Observed maternal sensitivity

Maternal behavior was continuously coded during the mother involved portion of the emotion eliciting tasks using 12 mutually exclusive categories described in Table 1. Inter-rater reliability for coding of maternal behavior was calculated based on 20 double coded cases,  $k = .89$ . Next, the infant affect and maternal behavior files were merged, and maternal sensitivity at each moment was assigned a sensitivity rating based on the appropriateness of the mothers' behavior given the infants' concurrent affect. Maternal sensitivity was rated on a 3-point scale (1 = insensitive, 2 = moderately sensitive, 3 = sensitive). For example, "monitoring" (i.e., watching but not intervening) received a sensitivity rating of 1 if infant affect was negative because the mother did not respond to the infant's distress cues, 2 if infant affect was positive because the mother may have missed out on opportunities for positive interaction, and 3 if infant affect was neutral because the infant was not signaling a clear need. Mothers' sensitivity across the fear and anger tasks was averaged to yield a continuous measure of *observed sensitivity* during distressing tasks. In prior research, scores from this coding system have predicted children's subsequent behavior problems (Crockenberg & Leerkes, 2006) and correlated with global ratings of sensitivity (Leerkes & Crockenberg, 2002), demonstrating its validity.

Table 1. Maternal behavior codes and sensitivity ratings based on concurrent infant affect.

Maternal behavior	Description	Sensitivity rating based on infant affect		
		Positive	Neutral	Negative
Negative	Directs negative affect toward the infant	1	1	1
Intrusive	Forces own agenda on the infant	1	1	1
Mismatched affect	Affect is incongruent with infant's	1	1	1

Maternal behavior	Description	Sensitivity rating based on infant affect		
		Infant affect		
		Positive	Neutral	Negative
Withdraw	Mother abruptly moves away or ends interaction with infant	1	2	1
Distracted	Uninvolved or minimally involved with infant	1	2	1
Persistent ineffective	Continues to respond to infant in same ineffective manner when alternative responses are available	2	2	2
Monitor	Watches infant/situation without intervening	2	3	1
Task focused	Engages with infant focusing on the arousing task	3	3	1
Calming	Soothes infant physically or vocally	3	3	3
Supportive	Maintains the infant's attention on the task while simultaneously calming the infant	3	3	3
Non-task focused engagement	Plays with or distracts the infant without using the arousing task	3	3	3
Routine care	Engages in practices like wiping nose, straightening clothing	3	3	1

*Note:* Infant positive affect is a rating of 1, 2, or 3, neutral is 4, and negative is a rating of 5, 6, or 7. A detailed codebook is available upon request.

## 5. Results

### 5.1. Preliminary analysis

Data was examined for missing values before analysis. Given that 4.78% of data were missing a single imputation was done using NORM software (Schafer, 1999). Maternal age, minority status (0 = European-American, 1 = Minority), education, income, and child gender were examined as potential covariates; none were significantly associated with any of the outcome variables and were not considered any further. Correlations and descriptive statistics for all predictor and outcome variables are in Table 2.

Table 2. Correlations and descriptive statistics for all variables.

	1	2	3	4	5	6
1. Engaged coping						
2. Disengaged coping	.28**					
3. Temp combined	.04	.01				
4. Mother reported sensitivity	.17	.06	-.01			
5. Mother reported insensitivity	.18	.30**	.02	-.04		
6. Observed sensitivity	.04	.00	-.50**	.09	-.04	
<i>M</i>	1.50	1.08	.00	5.73	2.90	2.76
<i>SD</i>	.38	.43	.80	.57	.54	.23

Note:  $N = 89$ .

\*\* $p < .01$

### 5.2. Hierarchical multiple regression models

Hierarchical multiple regression analyses were conducted to test the independence of effects and to test the proposed interaction effects between toddler reactivity and maternal coping styles on mothers' reported and observed sensitivity. Variables were centered prior to the construction of the interaction terms, and interaction terms were created by multiplying the centered main effect variable (temperamental reactivity) with the centered moderator (coping style). In the first block, the engaged and disengaged coping variable and toddler reactivity were entered. In the second block, interaction terms were entered. Interactions were interpreted by calculating simple slopes between temperamental reactivity and sensitivity at the values of  $\pm 1SD$  of the moderator (Aiken & West, 1991). Interactions that were significant at trend levels were interpreted given evidence

that detecting interactions in non-experimental research is difficult (Whisman & McClelland, 2005).

### 5.2.1. Maternal reported sensitivity

There was a significant main effect for disengaged coping styles on mothers' reports of insensitive responses to their toddlers' negative emotions (Table 3). Disengaged coping was positively associated with mothers' reports of insensitive responses to their children's negative emotions. Additionally, there was a significant interaction between engaged coping and toddler reactivity on maternal reported insensitive responses. Consistent with the hypothesis, toddler's temperamental reactivity was associated positively with mothers' insensitive responses to toddlers' negative emotions when mothers were low ( $-1SD$  from the mean) on engaged coping,  $\beta = .33, p = .06$ , but was unrelated to insensitive responses to negative emotions when mothers were high ( $+1SD$ ) on engaged coping,  $\beta = -.19, ns$  (Fig. 1). This model accounted for 16% of the variability in mothers' reported insensitive responses to their children's negative emotions. There were no significant main or interaction effects for mothers' reports of sensitive responses.

Table 3. Hierarchical multiple regressions predicting maternal sensitivity to toddlers' negative emotions.

Predictors in each block	Mother reported sensitivity			Mother reported insensitivity			Observed sensitivity distress tasks		
	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$
1. Engaged coping	.26	.17	.17	.16	.15	.11	.04	.06	.06
Disengaged coping	.01	.15	.01	.33	.13	.26*	-.01	.05	-.01
Temp combined	-.01	.08	-.02	.01	.07	.01	-.15	.03	-.51**
$R^2\Delta$			.03			.10*			.26**
2. Temp combined $\times$ Engaged coping	.00	.24	.00	-.46	.22	-.25*	.15	.09	.19 <sup>t</sup>
Temp combined $\times$ Disengaged	.10	.26	.05	-.05	.23	-.02	.04	.09	.04

Predictors in each block	Mother reported sensitivity			Mother reported insensitivity			Observed sensitivity distress tasks		
	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$
coping									
$R^2\Delta$			.00			.06			.04
Total model $R^2$			.03			.16*			.30**

Note:  $N = 89$ .

\* $p < .05$ .

\*\* $p < .01$ .

<sup>t</sup> $p < .10$ .

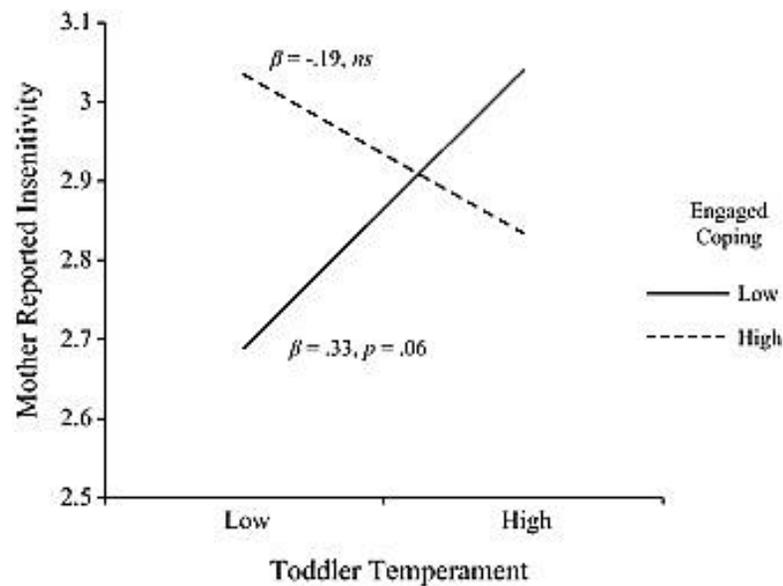


Figure 1. Moderating effect of mothers' engaged coping style on the association between toddler temperamental reactivity and mothers' reports of insensitive responses.

### 5.2.2. Observed sensitivity

There was a large negative effect of toddler temperament on observed sensitivity, but this effect was qualified by a trend level interaction with engaged coping. Simple slope analysis revealed that toddler's temperamental reactivity was more strongly negatively associated with mothers' observed sensitivity when engaged coping was low,  $\beta = -.74, p < .01$ , than when engaged

coping was high,  $\beta = -.35, p < .01$  ( Fig. 2). There was no interaction effect of disengaged coping on sensitivity and there were no main effects of coping on observed sensitivity. This model accounted for 30% of the variability in mothers' observed sensitivity to their children during the distressing tasks.

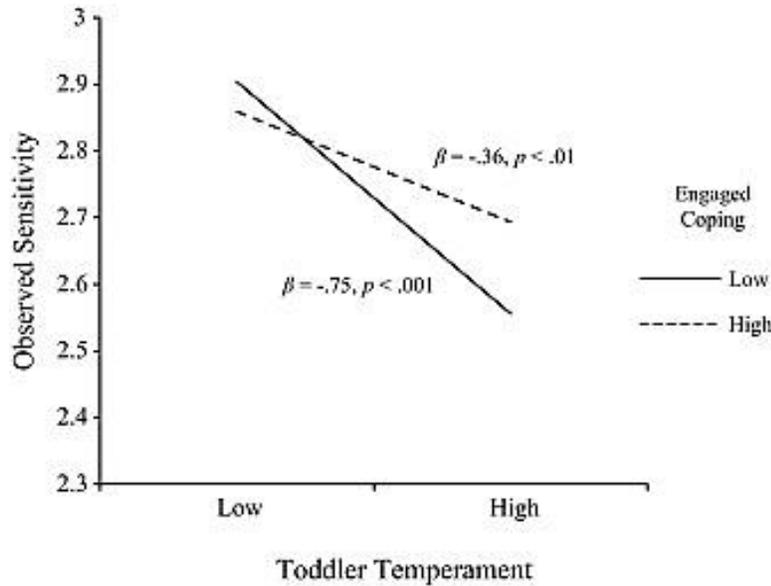


Figure 2. Moderating effect of mothers' engaged coping style on the association between toddler temperamental reactivity and observed sensitivity.

## 6. Discussion

The goal of this study was to examine links between maternal coping and subsequent reported and observed sensitivity to toddler negative emotions. The results supported the hypotheses that maternal coping styles would be adaptive in relation to sensitivity to toddlers' negative emotions and would buffer mothers from the negative effect of toddler temperamental reactivity on sensitivity. The nature of the effects, however, varied for engaged and disengaged coping styles as described below. In general, that maternal coping styles and child temperament both exerted effects on sensitivity is highly consistent with Belsky's (1984) view that parenting is a function of mothers' own psychological characteristics and their children's temperaments.

That mothers high on disengaged coping report responding more insensitively to their toddlers' negative emotions is consistent with the view that mothers' approach to handling their own emotions generalizes to how they respond to their children's emotions (Gottman, Katz, & Hooven, 1997). In addition, this finding supports the broader notion that how mothers think about, experience, and handle emotions is important for the affective context they provide to their children (Dix, 1991). Although disengaged coping was linked with the use of insensitive behaviors, such as punishing negative emotions, it did not reduce mothers' use of sensitive responses to children's negative emotions as it was not linked with either reported or observed

sensitivity. That mothers' reports of sensitive and insensitive responses to negative emotions were unrelated suggests that some mothers vary in their pattern of responses to negative emotions by behaving sensitively some of the time and insensitively other times. Identifying factors that shed light on this difference could be very useful. That engaged and disengaged coping styles were moderately positively correlated likewise suggests that mothers vary in the types of coping they use, likely dependant on the nature of the stressor. Examining mean differences in sensitivity to negative emotions between clusters of mothers who vary in the extent to which they use both engaged and disengaged coping would be a useful addition to the literature. For example, mothers who are high on engaged coping and low on disengaged coping may be the most sensitive in response to toddlers' negative emotions, whereas mothers who are high in both engaged and disengaged coping may vacillate between sensitive and insensitive responses depending on the context. Larger samples are needed to examine this possibility.

Consistent with our hypothesis, engaged maternal coping styles moderated the relationship between children's temperamental reactivity and mothers' observed and reported sensitivity. For observed sensitivity, engaged coping buffered mothers from the negative effects of their children's temperamental reactivity, such that reactivity was more strongly negatively associated with sensitivity when mothers were low versus high on engaged coping; in fact, high engaged coping reduced the negative effect of temperament on observed sensitivity by half. For mothers' reports of their insensitive responses to their children's negative emotions, engaged coping showed a similar effect. That is, toddler temperamental reactivity was positively associated with mothers' reports of insensitive responses when engaged coping was low, but was unrelated to sensitivity when engaged coping was high. This pattern of findings is consistent with Crockenberg and Leerkes' (2003) assertion that temperament is most likely to undermine parenting when other maternal resources are low. In this case, it is likely that mothers with an engaged coping style are sufficiently skilled at reducing their own negative arousal to prevent them from being insensitive when faced with a persistently distressed child. However, the absence of main effects of engaged coping on maternal responses to toddlers' negative emotions and that the interaction with temperament was not apparent in relation to mothers' self-reported sensitive responses may indicate that high engaged coping is not sufficient to promote highly sensitive responses to negative emotions. It may be that other characteristics such as positive beliefs about crying and infant-oriented goals are needed to promote highly sensitive responses to children's negative emotions (Leerkes, 2010). Regardless, that engaged coping reduces negative responding to temperamentally reactive children is an important finding, given such children often encounter harsh responses (Martorell & Bugental, 2006).

These results may have implications for intervention. Children who are high on temperamental reactivity are at elevated risk for difficulties with emotion regulation and greater behavior problems (Rothbart & Bates, 1998), and evidence suggests that maternal sensitivity to negative emotions is particularly important in relation to these outcomes (Davidov and Grusec, 2006 and Leerkes et al., 2009). Promoting mothers' engaged coping styles may enhance

sensitivity to negative emotions and related child outcomes. For example, in a study by Lee (2003), mothers who were in the treatment group that received home visiting, participated in support groups, and whose children received center-based child care had more adaptive coping skills than mothers in the control group; moreover, these adaptive coping skills buffered the effect of negative life events on maternal depression. Future intervention efforts may focus on teaching mothers' strategies to help them learn to actively address their own and their children's stressors and emotions. Helping mothers recognize the importance of emotions and how they are expressed or ignored, and encouraging positive interactions with their reactive children may further support mothers' ability to provide a supportive and caring environment for their children. Furthermore, promoting engaged coping styles may help buffer mothers against the negative effects associated with temperamentally reactive children.

We must acknowledge the limitations to this study. Sample size was small and consisted of predominantly middle-class, educated, Caucasian women and therefore limits generalizability to other ethnicities or lower SES populations. Also, this was a low-risk sample of first-time mothers. The small sample size also contributed to limited power to detect small effects. Future research should be conducted on larger, more demographically diverse samples. Additionally, although the Ways of Coping Questionnaire (Folkman & Lazarus, 1985) is widely used to assess coping styles in the literature, it is a measure of coping with stress in general rather than specific types of stressors. This is a limitation as mothers may use a variety of coping behaviors depending on the stressor at hand. Thus, it would be helpful to have a measure of how mothers cope with parenting or child-related stressors. That maternal sensitivity was only observed during two brief emotion-eliciting tasks may also be viewed as a limitation. However, the incorporation of maternal self-reports in which mothers are able to describe their typical responses to negative emotions over time and across situations compensate for this. Moreover, that some of the results converged across the observed and self-reported measure of parenting lends greater confidence to the results.

In summary, our findings lend insight for identifying mothers' psychological characteristics that promote maternal sensitivity to negative emotions, particularly when their toddlers are temperamentally reactive. Supporting mothers to actively engage in their own and their children's emotions can have both direct benefits for mothers' psychological functioning and the affective context they provide for their children, which may in turn promote adaptive child outcomes. Important future directions include identifying factors that hinder or promote engaged coping. For example, understanding the role of early trauma experiences and how they influence mothers' subsequent ability to cope with their own and their children's negative emotions may offer further insight into how early experiences may reduce mothers' ability to use engaged coping styles, and the importance of enhancing mothers' engaged coping.

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## References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interaction*. Thousand Oaks: Sage.
- Ainsworth, M. D., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.
- Belsky, J. (1984). The determinants of parenting: A process model. *Child Development*, 55, 83–96.
- Braungart-Rieker, J. M., & Stifter, C. A. (1996). Infants' responses to frustrating situations: Continuity and change in reactivity and regulation. *Child Development*, 67, 1767–1779.
- Calkins, S. D. (1994). Origins and outcomes of individual differences in emotion regulation. *Monographs of the Society for Research in Child Development*, 59(2–3, Serial No. 240), 53–72.
- Calkins, S. D., Hungerford, A., & Dedmon, S. E. (2004). Mothers' interactions with temperamentally frustrated infants. *Infant Mental Health Journal*, 25, 219–239.
- Cassidy, J. (1994). Emotion regulation: Influences of attachment relationships. *Monographs of the Society for Research in Child Development*, 59(2–3, Serial No. 240), 228–249.
- Crockenberg, S. C. (1986). Are temperamental differences in babies associated with predictable differences in caregiving? In J. V. Lerner, & R. M. Lerner (Eds.), *New directions for child development: Temperament and social interaction during infancy and childhood* (pp. 53–73). San Francisco: Jossey-Bass.
- Crockenberg, S. C., & Leerkes, E. M. (2003). Infant negative emotionality, caregiving, and family relationships. In A. C. Crouter, & A. Booth (Eds.), *Children's influences on family dynamics: The neglected side of family relationships* (pp. 57–78). Mahwah, NJ: Erlbaum.
- Crockenberg, S. C., & Leerkes, E. M. (2006). Infant and maternal behavior moderate reactivity to novelty to predict anxious behavior at 2.5 years. *Development and Psychopathology*, 18, 17–34.
- Davidov, M., & Grusec, J. E. (2006). Untangling the links of parental responsiveness to distress and warmth to child outcomes. *Child Development*, 77, 44–58.
- Denham, S. A., & Grout, L. (1993). Socialization of emotion: Pathway to preschoolers' emotional and social competence. *Journal of Nonverbal Behavior*, 17, 205–227.

- Denham, S. A., Mitchell-Copeland, J., Strandberg, K., Auerbach, S., & Blair, K. (1997). Parental contributions to preschoolers emotional competence: Direct and indirect effects. *Motivation and Emotion*, 21, 65–86.
- Dix, T. (1991). The affective organization of parenting: Adaptive and maladaptive processes. *Psychological Bulletin*, 110, 243–268.
- Fabes, R. A., Leonard, S. A., Kupanoff, K., & Martin, C. L. (2001). Parental coping with children's negative emotions: Relations with children's emotional and social responding. *Child Development*, 72, 907–920.
- Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: Study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology*, 48, 150–170.
- Goldsmith, H. H. (1996). Studying temperament via construction of the Toddler Behavior Assessment Questionnaire. *Child Development*, 67, 218–235.
- Goldsmith, H. H., Rieser-Danner, L. A., & Briggs, S. (1991). Evaluating convergent and discriminant validity of temperament questionnaires for preschoolers, toddlers, and infants. *Developmental Psychology*, 27, 566–579.
- Gottman, J. M., Katz, L. F., & Hooven, C. (1996). Parental meta-emotion philosophy and the emotional life of families: Theoretical models and preliminary data. *Journal of Family Psychology*, 10, 243–268.
- Gottman, J. M., Katz, L. F., & Hooven, C. (1997). *Meta-Emotion: How families communicate emotionally*. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Hagekull, B., Bohlin, G., & Rydell, A. M. (1997). Maternal sensitivity, infant temperament, and the development of early feeding problems. *Infant Mental Health Journal*, 18, 92–106.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.
- Lazarus, R. S., & Folkman, S. (1987). Transactional theory and research on emotions and coping. *European Journal of Personality*, 1, 141–169.
- Lee, K. (2003). Maternal coping skills as a moderator between depression and stressful life events: Effects on children's behavioral problems in an intervention program. *Journal of Child and Family Studies*, 12, 425–437.
- Leerkes, E. (2010). Predictors of maternal sensitivity to infant distress. *Parenting: Science and Practice*, 10, 219–239.

- Leerkes, E. M., Blankson, A. N., & O'Brien, M. (2009). Differential effects of maternal sensitivity to infant distress and non-distress on social-emotional functioning. *Child Development, 80*, 762–775.
- Leerkes, E. M., & Crockenberg, S. C. (2002). The development of maternal self-efficacy and its impact on maternal behavior. *Infancy, 3*, 227–247.
- Levy-Shiff, R., Dimitrovsky, L., Shulman, S., & Har-Even, D. (1998). Cognitive appraisal, coping strategies, and support resources as correlates of parenting and infant development. *Developmental Psychology, 34*, 1417–1427.
- Martorell, G. A., & Bugental, D. (2006). Maternal variations in stress reactivity: Implications for harsh parenting practices with very young children. *Journal of Family Psychology, 20*, 641–647.
- McElwain, N. L., & Booth-LaForce, C. (2006). Maternal sensitivity to infant distress and nondistress as predictors of infant-mother attachment security. *Journal of Family Psychology, 20*, 247–255.
- Paulussen-Hoogeboom, M. C., Stams, G. J., Hermanns, J. M., & Peetsma, T. T. (2007). Child negative emotionality and parenting from infancy to preschool: A meta-analytic review. *Developmental Psychology, 43*, 438–453.
- Roth, S., & Cohen, L. J. (1986). Approach, avoidance, and coping with stress. *American Psychologist, 813–819*.
- Rothbart, M. K., & Bates, J. E. (1998). Temperament. In W. Damon, & N. Eisenberg (Eds.), *Handbook of child psychology: Social, emotional, and personality development* (5th ed., Vol. 3, pp. 105–176). New York: Wiley.
- Schafer, J. L. (1999). Multiple imputation: A primer. *Statistical Methods in Medical Research, 8*, 3–15.
- Skinner, E., & Edge, K. (1998). Reflections on coping and development across the lifespan. *International Journal of Behavioral Development, 22*, 357–366.
- Spinrad, T. L., Eisenberg, N., Gaertner, B., Popp, T., Smith, C. L., Kupfer, A., et al. (2007). Relations of maternal socialization and toddlers' effortful control to children's adjustment and social competence. *Developmental Psychology, 43*, 1170–1186.
- Spinrad, T., Eisenberg, N., Kupfer, A., Gaertner, B., & Michalik, N. (2004, May). The coping with negative emotions scale. Paper presented at the International Conference for Infant Studies, Chicago.

Stanton, A. L., Kirk, S. B., Cameron, C. L., & Danoff-Burg, S. (2000). Coping through emotional approach: Scale construction and validation. *Journal of Personality and Social Psychology, 78*, 1150–1169.

van de Boom, D. C., & Hoeksma, J. B. (1994). The effect of infant irritability on mother-infant interaction: A growth-curve analysis. *Developmental Psychology, 30*, 581–590.

Whisman, M. A., & McClelland, G. H. (2005). Designing, testing, and interpreting interactions and moderator effects in family research. *Journal of Family Psychology, 19*, 111–120.

Yap, M. H., Allen, N. B., Leve, C., & Katz, L. (2008). Maternal meta-emotion philosophy and socialization of adolescent affect: The moderating role of adolescent temperament. *Journal of Family Psychology, 22*, 688–700.