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## The relations of mothers' negative expressivity to children's experience and expression of negative emotion

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### Abstract

Guided by the heuristic model proposed by Eisenberg et al. [Psychol. Inq. 9 (1998) 241], we examined the relations of mothers' reported and observed negative expressivity to children's ( $N = 159$ ; 74 girls;  $M$  age = 7.67 years) experience and expression of emotion. Children's experience and/or expression of emotion in response to a distressing film were measured with facial, heart rate, and self-report measures. Children's heart rate and facial distress were modestly positively related. Children's facial distress was significantly positively related to mothers' reports of negative (dominant and submissive) expressivity; the positive relation between children's facial distress and mothers' observed negative expressivity approached the conventional level of significance. Moreover, mothers' observed negative expressivity was significantly negatively related to children's heart rate reactivity during the conflict film. The positive relation between children's reported distress and mothers' observed negative expressivity approached the conventional level of significance. Several possible explanations for the pattern of findings are discussed.

### Keywords

Children's emotions; Maternal emotion; Emotional expressivity; Children's distress; Multimethod

## 1. Introduction

Understanding factors that contribute to children's emotional expressivity is important because children's ability to experience and express emotion in culturally and socially appropriate ways predicts their social functioning (Eisenberg, Cumberland, & Spinrad, 1998; Halberstadt, Crisp, & Eaton, 1999). For example, children's expression of positive versus negative emotion has been found to relate to their social competence with peers and adjustment (Denham & Grout, 1992; Sroufe, Schork, Motti, Lawroski, & LaFreniere, 1984). In addition, preschoolers who express high levels of anger and sadness are viewed as difficult and poorly adjusted (Denham & Burger, 1991; Denham, McKinley, Couchoud, & Holt, 1990; Denham, Renwick, & Holt, 1991). Due to the central role of children's emotional expressions in their social and emotional development, it is important to understand ways parents can promote or inhibit such responses. Therefore, the goal of this research was to examine the relations between children's physiological, facial, and reported expressions of emotion and their mothers' reported and observed negative expressivity. Findings from this study have the potential to further improve interventions and prevention

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programs that aim to promote children's social interactions through modifying the parent-child relationship.

Although a number of factors likely influence the development of children's emotional expressions, in the present study, we focus on the emotional environment of the family, and specifically on mothers' negative expressivity. It is likely that children first learn about how emotions are typically expressed, the messages they convey, and methods of emotion regulation in family interactions (Denham, 1998; Dunn, Bretherton, & Munn, 1987; Dunn, Brown, & Beardsall, 1991). Negative emotions expressed by parents are likely to affect children's emotional reactivity, the quality and security of relationships with members of the family, and their representations of themselves and of the social world (Cummings & Davies, 1996; Dunsmore & Halberstadt, 1997; Halberstadt et al., 1999). Indeed, there is initial evidence that children's expression or regulation of emotion mediates the relations between parents' expression of emotion and children's social competence and adjustment (Brody & Ge, 2001; Eisenberg et al., 2001). Moreover, preschoolers from negatively expressive homes seem to have difficulties interacting in an affectively positive way in their preschool (Denham & Grout, 1993; Denham, Mitchell-Copeland, Strandberg, Auerbach, & Blair, 1997). Thus, the emotional climate that children experience is viewed as having an important impact on children's overall social and emotional development.

The heuristic model provided by Eisenberg et al. (1998) provides a useful framework for conceptualizing much of the existing data on emotion socialization as well as the relations we examine in the present study. In their model, Eisenberg et al. reviewed the concept of parents' emotion-related socializing behaviors (ERSBs) and identified three ways parents socialize their children's emotions: (a) parental reactions to children's emotions, (b) parents' discussion of emotion, and (c) parents' expression of emotion. Parents' ERSBs are hypothesized to have indirect (through their effect on children's emotional arousal) and direct effects on children's experience, expression, understanding, and regulation of emotion. Eisenberg et al. argued that if parental ERSBs promote optimal levels of emotional arousal, they are likely to foster learning and constructive behavior; if they overarouse the children, they will tend to undermine opportunities for learning about emotions and their regulatory capacities.

For the purpose of the present study, we focus on one aspect of ERSBs—mothers' expression of negative emotion—and its relation to children's responses to a distressing film. Parental expressiveness is usually defined as, "a persistent pattern or style in exhibiting nonverbal and verbal expressions that often but not always appear to be emotion related; this pattern or style is usually measured in terms of frequency of occurrence" (Halberstadt, Cassidy, Stifter, Parke, & Fox, 1995, p. 93). Expressiveness often is viewed as either positive, negative dominant, or negative submissive. Positive expressiveness refers to positive emotional expressions, such as praising someone, demonstrating admiration, and/or expressing gratitude. Negative dominant expressiveness involves the display of emotions that are dominant or assertive; such displays often may threaten people and include expressions of anger or hostility. In contrast, negative submissive expressions are less assertive (e.g., sulking, expressing sorrow, and/or crying).

Generally, it has been assumed that children of parents who express their emotions overtly also will be emotionally expressive. Eisenberg et al. (1998), Halberstadt (1991), Halberstadt et al. (1999), Denham (1998) and others have suggested that these relations are due to social learning processes, such as imitation and contagion, although heredity of high emotionality also may play a role. Parents' expressivity also may be linked to children's expressivity because parents who value emotional expression, and are therefore more emotionally expressive, may encourage their offspring's expressivity. Parental expressivity also may

influence children's expectations and beliefs about the normativeness of the expression of positive or negative emotions (Dunsmore & Halberstadt, 1997), highlight the emotional significance of events for children (Barnett & Campos, 1991; Denham, 1998), and demonstrate ways of behaviorally expressing and regulating specific emotions (Denham, 1998).

Furthermore, it has been hypothesized that expressive parents tend to have children predisposed to experience their own and others' emotions due to similarities in biology, contagion of emotion in family interactions, and/or parents' support of children's development of the belief that emotions are important, acceptable, and even valued in their family or culture (Cole, Michel, & Teti, 1994; Halberstadt et al., 1999). Parents who express more negative emotion—particularly dominant negative emotions—also may be more rejecting, which could result in children experiencing more negative and less positive emotion. Gottman, Katz, and Hooven (1997) found that parents who were less accepting of the experience of emotion had children who were less emotionally regulated; such children might be expected to experience and express higher levels of negative emotion.

Empirical research provides some support for the hypothesized links between parents' expression of emotion and their offspring's expression and experience of emotion. Halberstadt et al. (1999) found that the positive association between parental negative expressivity and children's overt expression of negative emotion increased with children's age. Specifically, although relations between family expressivity and infants'/toddlers' expressivity were inconsistent, 6 of 10 studies (e.g., Denham, 1989; Denham & Grout, 1993) of preschool through elementary school children and 3 of 4 (e.g., Burrowes & Halberstadt, 1987) studies involving young adults showed a positive relation between parents' expression of negative emotion and their children's expression of negative emotion.

Halberstadt et al. (1999) also found that parental/family negative expressivity was increasingly associated with children's experience of negative emotion as offspring aged; however, the pattern of relations was not clear until early adulthood. For example, although findings were inconsistent for young children, among college students, parental negative expressivity was associated with women's proneness to depression (Cooley, 1992) and high levels of sympathy and distress for women (Eisenberg et al., 1991). According to social learning theory, the effects of being raised in a negatively expressive environment may be expected to become more prominent over time because of repeated exposure to negative expressivity.

The present study complements and extends those reviewed by Halberstadt et al. (1999) in important ways. In the studies reviewed by Halberstadt et al., few investigators used a multimethod approach; thus, it is difficult to understand discrepancies in findings across studies. In a number of the studies summarized by Halberstadt et al., parents' expression of emotion was assessed with self-report measures, which might sometimes be biased or not entirely accurate. Some investigators have used observations of parental expressivity; however, in these studies, parents' expression of emotion reflects their overt emotionality in that particular interaction with their child rather than more generally. Thus, in the present study, mothers' expressivity was assessed both in interactions with her children and with self-reports of her own expressivity with family members.

In addition, by using multiple methods to assess children's reactions to a distressing film, the limitations of relying solely on children's reported expressivity or experience of emotion are overcome. As noted by Eisenberg and Fabes (1990) and Eisenberg and Lennon (1983), children's reports may not always be accurate because (a) children's self-reports of emotion may reflect concerns about social desirability and (b) young children sometimes have

difficulties reporting their emotions. Consistent with the recommendations of Zhou, Valiente, and Eisenberg (2003), we used a combination of physiological and facial responding in addition to self-report measures to tap children's emotional reactions to the conflict film. Physiological measures of emotional responding are useful because they are more likely than facial or self-report measures (which also tap expressivity) to reflect emotional experience (rather than emotional expression, which may reflect factors other than felt emotion).

In a series of studies, Eisenberg et al. examined the relations between family expressiveness and children's physiological responses to emotionally evocative films. Eisenberg et al. (1992) found no relationship between familial negative expressivity and children's heart rate responses to an empathy-inducing film. However, the film used in that study was not expected to elicit substantial distress, which could account for the lack of significant relationships. In a study with young adults involving a more distressing film, women's, but not men's, heart rate acceleration during the distressing film was associated with family expression of positive emotion. These findings suggest that there are relationships between parental expressivity and offspring's physiological responding, but that either they increase with age or they can be found primarily when evocative stimuli are rather distressing.

Data relevant to the relationship of family/parental expressivity to children's expression and experience of emotion also can be found in research on children's reactions to viewing conflict between adults (most of these data were not reviewed by Halberstadt et al., 1999). Children often report feeling distress in response to marital conflict, which can be assumed to involve negative emotion (Cummings, Ballard, & El-Sheikh, 1991; Cummings, Vogel, Cummings, & El-Sheikh, 1989). Moreover, exposure to background anger between adults has been linked to children's facial and body displays of distress (Cummings, 1987; Cummings, Iannotti, & Zahn-Waxler, 1985), crying and yelling during marital conflict (Cummings, Goeke-Morey, & Papp, 2003), and increases in heart rate, systolic blood pressure, and skin conductance (Ballard, Cummings, & Larkin, 1993; El-Sheikh & Cummings, 1992; El-Sheikh, Cummings, & Goetsch, 1989). The fact that adults' anger elicits negative emotion from children in the same context does not necessarily indicate that children exposed to such conflict are more expressive and/or reactive in other situations, especially ones that are less threatening. However, some recent work suggests that exposure to marital discord sensitizes children to respond negatively to the expression of negative emotion in conflict situations. For example, Davies and Cummings (1998) found that a history of parental discord was positively related to children's observed emotional reactivity when they viewed their mother in a simulated conflict with an experimenter. Moreover, Davies, Myers, Cummings, and Heindel (1999) observed that children with a history of exposure to conflict between two adults (who were not their parents) displayed more negative emotion when exposed to subsequent conflict events. These findings are consistent with the notion that children exposed to negative dominant emotion are prone to experience and express such emotion themselves in other contexts involving conflict.

### 1.1. The present study

In the present study, we examined the relation of mothers' expression of negative emotion to children's experience and expression of negative emotion to a distressing film in which two parents of a child in the film were arguing. Mothers' expression of emotion was assessed with both self-reports and observations of their interactions with their children. Children's expression of negative emotion was assessed with their facial, physiological, and self-reported reactions to a distressing film clip of marital conflict.

Although children's emotional reactions to adult-adult conflicts frequently have been examined in relation to violence or marital conflict in the home, exposure to videotapes of

others' negative emotions seldom has been used in studies of family expressivity, although responses to such distressing films have the benefit of assessing children's emotional expressivity and/or experience in an emotional situation not involving real-life social interactions with a specific person. Assessing children's emotions in a situation that does not involve other individuals who might elicit or influence children's expression allows for the assessment of emotion that is not linked to specific social relationships. For example, parents and children in hostile relationships may be relatively likely to express hostility in their interactions with each other, but they may not readily express negative emotion in other contexts. Moreover, because the conflict in the film included events that were not actually occurring and did not involve the children's parents, children's responding was not likely to be affected by pressures to intervene or protect themselves, which can influence their strategies of emotional expression and regulation, including the use of display rules in real-life conflict situations (Thompson & Calkins, 1996).

Because of the distressing nature of the film, high levels of heart rate reactivity were expected to reflect primarily a distressed emotional reaction (i.e., the experience of emotion), including discomfort, anxiety, and upset (Eisenberg, Schaller, Miller, et al., 1988; Eisenberg et al., 1990). Facial expressivity was viewed as an index of emotional expressivity, although it often may also reflect emotional experience. Self-reported emotion was expected to reflect primarily the experience of emotion, although it could also indicate willingness to acknowledge the experience of emotion or provide a socially desirable response.

Heart rate responding has been used as an index of vicarious emotional responding, including vicariously induced distress. Anxiety and active coping have been associated with heart rate acceleration (Cacioppo & Sandman, 1978; Craig, 1968; Eisenberg & Fabes, 1990); heart rate acceleration also has been found to occur when recalling personally distressing memories or when viewing a frightening film (Eisenberg, Fabes et al., 1988; Eisenberg, Schaller et al., 1988). In contrast, heart-rate deceleration has been associated with the intake of information and may reflect an other-oriented or outer-directed focus of attention rather than distress (Cacioppo & Sandman, 1978; Eisenberg et al., 1989; Eisenberg & Fabes, 1990).

Based on the model presented by Eisenberg et al. (1998) and some empirical evidence of a positive association between parent/family negative expressivity and child negative expressivity (Halberstadt et al., 1999), we expected children with mothers high in reported and observed negative expressivity to express more facial negative emotion when viewing a distressing film and to report more distress. Although data pertaining to the relation of parents' negative expressivity with young children's heart rate reactivity to distressing vicarious stimuli are not entirely consistent, based on some empirical evidence (Eisenberg et al., 1991), we tentatively predicted that maternal negative expressivity would relate positively to children's heart rate responding when viewing distressing events. However, given that children exposed to high levels of negative emotion may be more attuned to such emotion, it was also possible that maternal expression of negative emotion would be associated with heart rate deceleration (due to enhanced attention).

## 2. Method

### 2.1. Participants

Children in this study were involved in the second wave (T2) of an ongoing longitudinal study of children's socioemotional development (Eisenberg et al., 2001, 2003; Spinrad et al., 1999). Participants in this study were 74 girls and 85 boys ( $M$  age = 7.67 years,  $SD$  = .85). The children were primarily non-Hispanic Caucasian, (72%); 4% were American Indian; 4%

were African American; 15% were Hispanic; 1% were Asian; and 4% were of other origins. Parents were moderately well educated; mean levels of education were 3.78 (a little college) and 3.86 for mothers and fathers, respectively (1 = less than a high school education, 3% of mothers and 7% of fathers; 2 = high school degree, 13% of mothers and 17% of fathers; 3 = less than 2 years of college and/or no degree, 38% of mothers and 20% of fathers; 4 = 2-year college degree, 9% of mothers and 14% of fathers; 5 = college degree, 24% of mothers and 21% of fathers; and 6 = a professional degree, 13% for mothers and 21% of fathers). Family income ranged from less than US\$20,000 to above US\$100,000 with a mean and median between US\$40,000 and 60,000.

Two years prior to this study, the children were recruited through schools, newspaper ads, and flyers that were placed at after-school programs and preschools in a large suburban area in the Southwest United States. Because a primary goal of the longitudinal study was to recruit a sample of children that was relatively diverse in regard to problem behavior, the Child Behavior Checklist (CBCL; Achenbach, 1991a) was verbally administered over the phone to the parent, generally to the mother. A total of 315 parents completed the questionnaire; all children with *T* scores of 60 or higher on either internalizing or externalizing were chosen for participation. Achenbach (1991b) designated scores of 60–63 as indicating moderate risk and higher scores as indicating relatively high risk for the given type of problem behavior. In addition to the children selected because their *T* scores were above 60 (on either internalizing or externalizing), children who had *T* scores below 60 on both the internalizing and externalizing scales were considered control (nondisordered) children and were matched as closely as possible in regard to age, sex, race, and social class (using parental education and occupation). This process resulted in a total of 214 participating children and their parents. All children included were attending regular schools.

Of the original sample ( $N = 214$ ), 185 children or parents completed some data at T2. According to *t* tests, no differences were found between those who attrited and those who remained in the study for children's age, maternal or paternal education, family income, mothers' reports of negative expressivity, or for children's externalizing and internalizing (reported by mothers and teachers) problem behaviors obtained at Time 1. According to chi-square tests, attrition was not related to the child's gender or ethnicity. Because this study focused on children's reactions to the evocative film, only data for children who were present in the laboratory portion of the study were included in this data sample ( $n = 175$ ). Additionally, only children whose mothers completed both the questionnaires and observational task were used in the analyses. Thus, 16 children were dropped because fathers completed either the questionnaires or observational task, resulting in a final  $N$  of 159.

## 2.2. Procedures

Children and their mothers were met on the campus by an undergraduate research assistant who brought them to the laboratory. Prior to entering the laboratory, the experimenter obtained written consent from the parent and assent from the child. Once in the laboratory, a same-sex research assistant said, "First I am going to clean your skin with this (pointing to a bottle of witch hazel that was used to clean the skin). Next, I am going to rub your skin with this (pointing to a luffa) and then I will place these stickers on your skin." Children also were told that astronauts wear some electrodes like ours when they go into space. The research assistant then attached two pre-jellied electrocardiograph electrodes to the child's front ribs, and a third electrode on the child's back (without removing clothing). The electrodes were linked to a Colbourne impedance pneumograph coupler (S73-22), a Grass physiograph, and a computer in an adjoining room. Because movement can interfere with

heart rate responding, the experimenter reminded children to keep still during the films. The mother subsequently was taken to another room to complete some questionnaires.

After the child was administered two questionnaires, the experimenter briefly explained the two short films the child was going to watch. The first film was a professionally produced calm film about a dolphin swimming in the sea (Bugental, Blue, Cortez, Fleck, & Rodriguez, 1992) and was used to collect baseline heart rate responses and facial reactions. The baseline film was 165 s. After that film was over, the child rang a bell and the experimenter entered the room. The experimenter explained that the second film, which was also professionally produced, was about a little girl “about your age” whose parents were fighting (Rassulo, 1995). The first 54 s of the conflict film consisted of a relatively neutral interaction between the girl and her father. Three psychologists determined that the critical segment began 54 s into the film at which point the parents could be seen yelling at each other while the child was in the room. The consensus of the three psychologists who viewed the film prior to the study was that the parents’ argument constituted a dramatic change in the nature of the video. The distressing segment was 69 s and consisted of an argument between the parents; during the distressing segment, the parents were yelling at each other about taking care of their daughter. During both films, children’s facial expressions were videotaped and their heart rate was recorded (the experimenter left the room during each film). Following the distressing film, children completed a questionnaire designed to assess their emotional reactions to the film (e.g., distress and anxiety). After the film, the mother was brought back into the experimental room to assist the child in completing an origami task. During this 4-min interaction, both the mother and child were videotaped using two hidden cameras. The purpose of this task was to assess mothers’ expression of negative emotion during a parent–child interaction. Participants were debriefed and paid US\$25 for their participation.

### 2.3. Measures

A multimethod assessment was used in an effort to measure the criterion variables of children’s negative emotions and the predictors (e.g., mothers’ negative expressivity). Exposure to the conflict film was designed to elicit children’s emotional expressions (heart rate, facial distress, and self-reports). The predictor variables (mothers’ negative expressivity) were assessed both observationally and with a self-report measure. Due to the recruitment procedures described above, we reassessed children’s externalizing and internalizing behaviors with the CBCL so that the level of problem behavior could be controlled.

#### 2.3.1. Reactions to the conflict film

**2.3.1.1. Heart rate:** Heart rate data were collected every 10 ms and were used to calculate mean heart rate per 1/2 s. Although it did not occur often, heart rate artifacts (e.g., responses clearly a result of the child’s movement or talking and not an emotional reaction), as determined by a visual inspection of the polygraph record of the heart rate responses, were edited out, as were other obvious artifacts using software that averaged the beats before and after those deleted (and was time-locked). The heart rate samples were used to compute the mean heart rate during the baseline film (for 2 min) and the conflict film (54–123 s). Although the first 54 s of the conflict film were relatively neutral, there was some slightly distressing music and conversation between the child and her father. Therefore, the dolphin film was deemed a more appropriate measure of baseline responding.

**2.3.1.2. Facial reactions:** Children’s facial emotions of sadness, distress, happiness, fear, and anger were coded on a five-point Likert scale every 20 s during both the baseline and conflict film (1 = *an absence of emotion*; 5 = *a consistent and/or intense display of emotion*;

Eisenberg et al., 1989).<sup>1</sup> Facial displays of happiness ( $M = 1.02$ ;  $SD = .12$ ), fear ( $M = 1.05$ ;  $SD = .24$ ), and anger ( $M = 1.02$ ;  $SD = .16$ ) also were coded but were not considered in the data analysis because they occurred very infrequently during the conflict film. Expressions of sadness and distress were coded using criteria for facial emotion based on Ekman and Friesen's (1975) descriptions and pictures of emotional expressions and pictures from Ekman's more recent training materials. This procedure has been used in studies on vicariously induced emotion (e.g., Eisenberg et al., 1989, 1994; Eisenberg, McCreath, & Ahn, 1988).

Expressions of sadness included inner eyebrows raised and drawn together, the corners of the upper lip drawn down, and/or lower lip raised. Distress was coded when children pulled on their lip, rubbed their face repeatedly or bit their lip, or furrowed their brow downward as in mild apprehension. Because interrater reliability was higher when sadness (which occurred less often) and distress were combined, and because both emotions were expected to reflect similar expressions of negative emotion in response to this particular film, scores for the two were summed and adjusted so they were still on a 1–5 scale. We had difficulty obtaining high levels of reliability on sadness in reaction to this film, perhaps because there was little pure sadness. Interrater reliabilities (Pearson  $r$  values) for the composite of sad/distress were .78 and .74 for the baseline film and the evocative portion of the conflict film, respectively. In a review, Eisenberg and Fabes (1990) demonstrated that facial codes of distress and sadness (as assessed above) are both reliable and valid (e.g., they relate to prosocial behavior in predicted ways).

**2.3.1.3. Children's reported expression of emotion:** Following the conflict film, each child rated his or her emotional reactions to the film (down, angry, unhappy, sad, upset, nervous, and scared) using a Likert scale ranging from 1 (*not at all*) to 4 (*feel that way a whole lot*). As needed, terms were clarified for children by giving them examples of the emotion. The experimenter read each word to the child; the child then rated each item by pointing to a visually presented scale that indicated how strongly they experienced the emotional reactions.

A principal components analysis with varimax rotation and a cutoff point of .60 for factor loadings indicated that children's reports of feeling down (loading = .80), unhappy (.78), sad (.76), and upset (.60) all loaded on the first factor and were averaged (henceforth labeled reported sadness). Children's reports of being nervous (.86) and scared (.80) loaded on the second factor and were averaged (henceforth labeled reported distress). Anger did not load above .40 on either factor; therefore, we did not include it in either composite.  $\alpha$  Values for sadness and distress were .78 and .68, respectively. Similar measures of self-reported reactions to films sometimes have been linked to children's prosocial behavior and parenting (e.g., Eisenberg & Fabes, 1990; Fabes, Eisenberg, & Miller, 1990), although the validity of children's self-reports of emotional reactivity seems to increase with age (Eisenberg & Fabes, 1990). We did not collect baseline data on verbal reports because we have found that young children seem to have difficulty reporting their emotion when no evocative event has occurred (i.e., when they are simply asked how distressed they are for no apparent reason).

**2.3.2. Children's social desirability**—Fourteen items from Crandall, Crandall, and Katkovsky's (1965) scale were used to assess children's dispositional tendency to provide

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<sup>1</sup>Children's facial displays of fear and anger were likely low because they did not know the people arguing in the film, and they were older than most of the children who have been used to examine these issues. These findings are consistent with those of El-Sheikh and Cheskes (1995), who found that elementary school children reported little fear or anger when viewing a videotape of unknown adults involved in verbal conflict. Because of the distressing nature of the film and the children's age, we did not expect children to experience much sympathy. The concerned attention expressions that have been coded as sympathy in other studies likely could have been due to attention while trying to understand what the parents were yelling. Thus, measures of concern were not used in this study.



socially desirable responses (e.g., Are you always polite to older people?). Items were rated 1 = yes and 2 = no. The  $\alpha$  for this scale was .75.

### 2.3.3. Children's problem behaviors

**2.3.3.1. Externalizing behaviors:** Mothers completed the CBCL and teachers completed the TRF (Achenbach, 1991a, 1991b). Based on the expert ratings, 3 out of 25 items for teacher-rated aggression (i.e., items 77, 93, and 104 with content about being loud, talking too much, and being easily frustrated, respectively) and 2 out of 20 items for parent-rated aggression (items 93 and 104) were removed because the items were believed to reflect temperament more than problem behaviors (see Eisenberg et al., 2003). Externalizing behaviors were measured by the sum of responses to 31 mother-reported items and 30 teacher-reported items (each coded 0 to 2 per standard procedures). The  $\alpha$  values for the externalizing scale were .89 and .96 for mothers and teachers, respectively.

**2.3.3.2. Internalizing behaviors:** As is typical, anxious/depressed, withdrawn, and somatic complaint subscales of the CBCL and TRF were used to assess internalizing behaviors. Based on the expert ratings, 3 out of 9 items for the withdrawn subscale for parent and teacher were deleted (i.e., to do with being slow moving, preferring to be alone, and being shy; items 42, 75, and 102). In addition, 2 of 18 total items for anxious/depressed scale for teacher (i.e., relating to self-consciousness and feeling hurt when criticized; items 71 and 81) and 1 item of 14 for mothers (regarding self-consciousness) were rated as more of temperament than psychopathology items. Internalizing behaviors were measured by the sum of responses to 27 mother-reported items and 30 items for teachers.  $\alpha$  Values for scores for mothers and for teachers were .87 and .89, respectively.

### 2.3.4. Mothers' expressivity

**2.3.4.1. Expressed emotion in the home:** The mothers completed Halberstadt et al.'s (1995) Self-Expressiveness in the Family Questionnaire (SEFQ). The SEFQ is commonly used to tap expressiveness and has good reliability and validity (Halberstadt et al., 1995). Items were rated on a nine-point Likert scale (1 = *rarely expresses feeling*; 9 = *frequently expresses the feeling*). Negative dominant expressivity was measured as the average of 10 items (e.g., "Showing contempt for another's action";  $\alpha = .79$ ), and negative submissiveness was the average of 10 items (e.g., "Expressing disappointment or sorrow";  $\alpha = .70$ ).<sup>2</sup> Mothers' negative dominant and negative submissive expressivity were positively correlated  $r(155) = .46, p < .001$ ; thus, they were standardized and then averaged to form *mothers' reported negative expressivity*. Investigators often combine the two types of negative emotions in analyses (Halberstadt et al., 1995, 1999).

**2.3.4.2. Observed maternal expressivity:** To observe mothers' expression of negative emotion, mothers and children were videotaped for 4 min while they engaged in a parent-child interaction (e.g., making a frog using origami paper and an instruction sheet). Mothers were told they could help their children as little or as much as necessary without actually folding the paper. Children were instructed that they would win points toward a prize if they could make an origami frog and that the parent was allowed to help, without actually folding the paper. After providing the directions, the experimenter left the room.

<sup>2</sup>The item "Sulking over unfair treatment by a family member," which was coded as submissive negative emotion in Halberstadt (1986) but as dominant negative emotion in Halberstadt et al. (1995), was coded here as submissive negative emotion. This decision was based on both face validity and the finding that dropping it from the negative submissive scale lowered the  $\alpha$  of that scale .03 and only lowered the  $\alpha$  for dominant negative emotion .01. The negative dominant scale with this item correlated .99 with the scale without this item, so it made little difference in the findings.

Multiple indicators of negative expressivity were used in order to improve reliability and validity. Discouraging remarks, global distress, and negative affect were used to assess mothers' observed negative expressivity. Mothers' discouraging remarks (e.g., "this is a dumb task" or "this is stupid") toward the task were counted and summed [interrater reliability = .77 based on 56 children (35% of the sample)]. Distress, coded once per parent-child dyad, referred to the degree to which the parent was having difficulty dealing with the child's negative emotions (the degree to which the parent finds the child's frustration aversive). Indices of distress included biting the lip, concerned looks, and rigid or tense posture and avoidance behaviors, looking anxious, worried, or nervous (1 = *no distress*; 5 = *consistent and/or intense displays of distress*; interrater reliability = .77). Mothers' negative affect also was recorded every 30 s for 4 min on a 1–5 scale (resulting in eight codes). Behavioral markers of negative affect included, but were not limited to, frowning, biting lips, and sad looks; it included distress (as defined above) as well as any other general expression of negative emotion. The eight negative affect codes (coded every 30 s for 4 min) were averaged. Interrater reliability for the negative affect code was .91 and had an  $\alpha$  of .75. Distress and discouraging remarks were correlated,  $r(157) = .18, p < .05$ , and the standardized average of distress and discouraging remarks was correlated with the standardized mean of the eight negative affect codes,  $r(157) = .60, p < .001$ . These two composites were therefore averaged and are henceforth referred to as *mothers' observed negative expressivity*.

Although the mother-child interaction was somewhat brief, in other studies, mothers' expressivity during similar mother-child interactions has correlated significantly with mothers' reports of expressivity (in the expected directions) and with various indices of children's social functioning (Eisenberg et al., 2001). Thus, although 4 min is somewhat short, the data observed during this time period likely are valid and were expected to predict theoretically relevant constructs.

### 3. Results

#### 3.1. Analytic strategy

First, descriptive analyses were conducted to detect potential age and sex differences. Second, we examined the zero-order correlations among the variables in the present study. Finally, we used a path analysis to test whether mothers' negative expressivity was related to children's reactions to the conflict film.

#### 3.2. Descriptive analyses

Means and standard deviations are presented in Table 1. In addition, mean heart rate at the beginning of the conflict portion of the film (at 54 s) was 88.36 ( $SD = 13.79$ ). When the variables (mothers' observed negative expressivity, measures of heart rate, facial distress, and children's reported distress) with skewed distributions were transformed (using either the logarithm or square root; Tabachnick & Fidell, 1996), the overall pattern of findings was very similar to the pattern when the analyses were conducted with nontransformed data. Thus, the results from the nontransformed data are presented.

In a series of initial analyses, age and sex differences were examined. A multivariate analysis of variance (MANOVA) was computed with sex as the independent variable and mothers' reported and observed expressivity as the dependent variables. Mothers' reports of negative expressivity and their observed negative expressivity did not differ for boys and girls. Two separate analyses of covariance (controlling for baseline levels of responding) with child sex as the independent variable indicated that children's heart rate and facial responses to the film also did not differ by sex;  $t$  tests indicated that children's self-reports of

emotion did not differ based on sex. Age did not correlate significantly with the measures of mothers' reported or observed negative expressivity or with the children's responses to the film.<sup>3</sup> Children's social desirability responding was not related to children's reported distress or sadness.

Because heart rate often declines when people first focus their attention on an evocative film (Zahn-Waxler, Cole, Welsh, & Fox, 1995), we examined the pattern of heart rate responding during the relevant portion of the conflict film with a repeated-measures analysis. A decline in heart rate generally is viewed as reflecting an outward focus of attention due to involvement and taking in information about the film (Cacioppo & Sandman, 1978). The mean heart rate per 1/2 s was the unit of analysis; children's heart rate 2 s just prior to the beginning of the evocative portion of the film were included. For heart rate, there were positive and significant linear and quadratic effects across time,  $F_s(1,170) = 7.87$  and  $15.02$ ,  $p_s < .01$  and  $.001$ . Examination of the means indicated that children's heart rate decreased immediately after the conflict began and then increased to a mean heart rate somewhat higher than at the beginning of the evocative portion of the film. Therefore, although the heart rate means for the baseline and conflict films are similar, the above analysis suggests that the conflict film elicited heart rate reactions from the children.

### 3.3. Interrelationships among children's responses to the film

To examine the relationships among children's reactions to the film, heart rate, facial expressions, reported sadness, and distress were intercorrelated. In these analyses, baseline levels of responding were partialled out as necessary (e.g., for heart rate and facial distress during the conflict film; see Table 2). Children's facial distress during the dolphin film was significantly positively related to their facial distress during the evocative film and their heart rate during the dolphin film was significantly positively related to their heart rate during the evocative film. In addition, children's heart rate and facial distress were significantly positively correlated during the evocative film.

### 3.4. Relationship of mothers' negative expressivity to children's responses to the film

The primary aim of the study was to examine the relationship of children's responses to the distressing film to mothers' reported and observed negative expressivity. In order to test our hypotheses, we used Mplus (Muthen & Muthen, 1998) to conduct a path analysis. In the hypothesized model, there were four dependent variables (facial distress and heart rate during the conflict film, reported sadness and reported distress) and two predictors (mothers' reported and observed negative expressivity). We estimated paths from mothers' reported expressivity and observed expressivity to each of the dependent variables. In addition, we included paths from heart rate during the dolphin film to heart rate during the conflict film and from facial distress during the dolphin film to facial distress during the conflict film. We did not estimate covariances among the variables. The various measures of children's negative responding were not combined because they did not load well on the same factors. The initial model did not fit well,  $\chi^2(18, N = 159) = 50.205$ ,  $p < .001$ ; Comparative Fit Index (CFI) = 0.91; RMSEA = 0.106 [confidence intervals (CI) for the RMSEA = 0.072 to 0.141], and the modification indices suggested that a covariance between heart rate and facial distress during the conflict film was needed, as was a covariance between reported distress and sadness. Because these minor alterations were theoretically and empirically justified, we added these estimates to the next model. The revised model fit the data well,  $\chi^2(16, N = 159)$

<sup>3</sup>Further exploratory analyses were conducted to determine if experiencing a divorce in the previous 2 years related to children's reactions to the film. Additionally, based on primarily care-giving parents' reports of stressful events in the home, a composite was created which represented moderate to severe conflict in the home, stressful events, or serious medical conditions. A series of ANCOVAs suggested that parental divorce did not relate to the children's responses. According to correlational analyses, the stress composite also did not relate to the children's reactions to the film.

= 14.648, ns; CFI = 0.99; RMSEA = 0.001; CI for the RMSEA = 0.00 to 0.067), and was a significant improvement in fit from the first model,  $\chi^2_{\Delta}(2)=35.56$ . The improvement in fit occurred because we allowed additional parameters to be estimated. As presented in Fig. 1, facial distress during the conflict film was significantly positively predicted by facial distress during the dolphin film and by mothers' reported negative expressivity; the association between observed negative maternal expressivity and children's facial distress approached the level of significance ( $p < .10$ ). Heart rate during the conflict film was significantly positively predicted by heart rate during the dolphin film and significantly negatively predicted by observed negative expressivity.<sup>4</sup> Although there was not significant prediction of reported sadness, there was a positive relationship between observed negative expressivity and reported distress that approached the level of significance ( $p < .10$ ). Residuals were .19, .75, .99, and .96 for child heart rate during the conflict film, child facial distress during the conflict film, reported distress and sadness, respectively. When we estimated a model using standard errors robust to violations of multivariate normality, the patterns of findings were the same.

### 3.5. Alternative models

**3.5.1. Types of expressivity**—The relationships of parent-reported negative expressivity and children's emotional reactions sometimes vary based on the type of negative expressivity (e.g., submissive or dominant). Therefore, we computed the path analysis using either negative submissive or negative dominant expressivity (rather than the average of the two). The relationships between the negative submissive (or dominant) expressivity measures and children's distress-related reactions were similar in their significance level to those reported using the average of negative submissive and dominant expressivity.<sup>5</sup>

**3.5.2. Tests of moderation by sex or age of the child and SES of the family**—Using Box's M, we tested whether the covariance matrices differed for boys and girls, older and younger children, or for low and high SES families (Winer, 1971, based on a median split). Results from Box's M indicated that neither children's sex,  $F(36, 75065) = 39.93$  (ns), age,  $F(36, 71172) = 24.32$  (ns), nor family SES,  $F(36, 76761) = 33.30$  (ns) moderated the hypothesized model.

**3.5.3. Child-driven model**—Although the fit of the overall model was consistent with our hypothesized model, it was possible a reversed model could fit the data. Indeed, when we reversed the direction of the paths (e.g., predicted maternal negative expressivity from child responses), the model fit the data well,  $\chi^2(6, N = 159) = 2.49$ , ns; CFI = 0.99; RMSEA = 0.001; CI for the RMSEA = 0.00 to 0.053. Mothers' observed negative expressivity was positively predicted by children's reported sadness and facial distress during the conflict film and negatively predicted by children's reported distress. Mothers' observed negative expressivity was significantly negatively predicted by children's heart rate and positively predicted by facial distress during the conflict film. The positive relationship between mothers' observed negative expressivity and reported distress approached the conventional level of significance. Because the child-driven model was not nested within or hierarchical

<sup>4</sup>We also used children's skin conductance as another index of physiological responding. However, consistent with El-Sheikh's (1994) findings that skin conductance responses to interadult anger were unrelated to a history of marital conflict, skin conductance was not related to mothers' reported or observed expression of negative emotion. Although El-Sheikh and Cummings (1992) found that preschoolers' skin conductance increased in response to angry interactions between adults, the increase was only significant for those with an escape option and similar to the data in the present study, skin conductance did not increase for those who did not have an escape option.

<sup>5</sup>Quadratic relations between mothers' negative expressivity and children's emotion understanding (Dunn & Brown, 1994) and sympathy and personal distress (Valiente et al., 2002) have been reported. However, we did not find evidence of quadratic relations between mothers' negative expressivity and children's responses to the film.

to the parent-driven model, a  $\chi^2$  difference test could not be used to choose between the models; rather, the AIC was used to compare the models (Kline, 1998). The lower AIC of the parent-driven model, AIC = 4588.03, than that of the child-driven model, AIC = 4595.872, suggests that the hypothesized model provides a better fit of the data than the child-driven model.

#### **3.5.4. Relationships between problem behaviors and social desirability—**

Because some of the participants were selected due to their having relatively high levels of externalizing or internalizing problem behavior, we computed an additional model in which we controlled for children's level of externalizing and internalizing behavior. To control for presentation biases, we also included children's social desirability responding in the model. Therefore, in this expanded model, there were four dependent variables (facial distress and heart rate during the conflict film, reported sadness and reported distress), and five predictors (mothers' reported and observed negative expressivity, internalizing and externalizing problems, and social desirability responding). We estimated paths from mothers' reported expressivity, observed expressivity, internalizing behaviors, externalizing behaviors and social desirability responding to each of the dependent variables. In addition, we included paths from baseline heart rate to heart rate during the conflict film and from baseline facial distress to facial distress during the conflict film. This model fit the data well,  $\chi^2(31, N = 159) = 34.734$ , ns; CFI = 0.991; RMSEA = 0.028; CI for the RMSEA = 0.00 to 0.067). All paths in this model were at the same significance level of those presented in Fig. 1, and none of the paths from internalizing or externalizing problem behaviors or from social desirability responding was significant.

## **4. Discussion**

Consistent with model proposed by Eisenberg et al. (1998), findings by Cummings (1987), and the research reviewed by Halberstadt et al. (1999), maternal observations and reports of negative expressivity were consistently positively related to children's expression of facial distress/sadness (albeit prediction from mothers' observed negative expressivity was only significant at the .10 level). It is unclear if the children of expressive mothers displayed more negative emotion because they had learned that it was acceptable or normative to do so and, consequently, were relatively unlikely to inhibit their expressions of negative emotion; or if expressive children and mothers were both prone to relatively intense negative emotion, perhaps due to heredity (Plomin & Stocker, 1989). It is also possible that negatively expressive children had developed negative interpretations of events in their world (which foster negative reactivity) based on their mothers' tendency to express negative emotion in the family (Dunsmore & Halberstadt, 1997).

This finding is of interest because in the present study, children's expressivity was measured when they were in a situation that was not personally threatening to them and when they were not engaged in social interaction. Thus, the measure of facial expressivity was a relatively pure measure of children's expression of emotion in response to evocative stimuli, rather than emotion directed to a specific person (e.g., the parent) or in response to the implications of the ongoing events for the child's own welfare or desires (e.g., fear due to the implications of a conflict for oneself). Moreover, because no one was in the room to observe the children's facial expressions, children's expression of emotion probably did not reflect an attempt to communicate emotion to another or to react in a manner consistent with expected display rules. An important avenue for future research is to identify how emotion expressed in the laboratory is similar to, and differs from, emotion expressed in more naturally occurring social interactions.

In addition to the relationships with facial distress/sadness, and similar to the finding for adults reported by Eisenberg et al. (1991), observed negative expressivity was significantly negatively related to children's heart rate. As noted by El-Sheikh et al. (1989), there are numerous possible explanations for such findings. First, children who view more negative emotionality in their families may attend more, or be more interested in, displays of verbal anger, which could result in heart rate deceleration. Second, Buck (1984) suggested that children gradually learn to display their emotions either internally or externally, in part because children who receive sanctions for displaying emotion learn to hide their emotions while also associating emotional experience or situations with aversive consequences. It is possible that children in expressive families learn over time to express their emotion overtly (e.g., facially), whereas those in less expressive families learn to express emotion internally rather than overtly (i.e., exhibit greater physiological arousal but less facial/gestural emotion). Thus, children in expressive families may show interest in emotion (resulting in heart rate deceleration) but may be less likely than children from nonexpressive families to become physiologically aroused in evocative contexts. Consistent with the notion that some individuals display their emotions externally whereas others express them internally, Cole, Zahn-Waxler, Fox, Usher, and Welsh (1996) found that children who expressed their distress overtly (through facial reactions) when viewing negative tapes, in comparison to nonexpressive children, showed more slowing of heart rate while viewing the negative tapes. Thus, the pattern of findings emerging in this and in other studies (see Halberstadt et al., 1999) suggests that maternal expressivity relates to measures of children's experience and overt expression of emotion, albeit in a complex way. However, because the negative relationship between heart rate and maternal negative expressivity was not predicted, it should be viewed with caution until replicated.

There were few findings for children's reported distress and sadness—the positive relationship between children's reports of distress and mothers' observed negative expressivity only approached the conventional level of significance. This finding is not surprising given that self-reports of emotion generally do not predict children's behavior (e.g., prosocial behavior) as well as physiological or facial measures (Eisenberg & Fabes, 1990). Until at least middle childhood, it is likely that self-reports of vicarious emotional responding are weak measures of children's emotional reactivity. Based on the premise that self-reports are probably stronger measures of emotionality for older children, when using self-reports in samples of younger children, it is recommended that other indices of emotionality be obtained in conjunction with self-report measures.

The methodology used in this study is a strength of the present paper. Maternal expressivity was assessed with both observations and self-reports. Additionally, children's distress-related responses were measured with self-report, observational, and physiological indexes. Three methods were used to assess children's reactions to the film in an attempt to portray a more complete picture of children's responses. Often, it is the case that these measures do not relate to one another (but are predicted by similar constructs), in part, because each measure taps a somewhat different process. Due to the use of multiple methods, the findings could not have been due to similarities in the method of measurement of maternal and child constructs, or due to a single reporter providing data on both maternal or child expressivity. In addition, children's desire to be viewed as socially appropriate was unlikely to have influenced the findings for two reasons: because they were alone while viewing the film and because a measure of social desirability responding was unrelated to their reports of distress.

Despite these strengths, there were several limitations of the study. First, because of the correlational nature of the data, the direction of effects is unclear. For example, based on our data, we cannot determine if maternal expressivity led to children's emotion-related expressivity or experience; if emotional or expressive children elicited more emotion

expressivity from their parents; or if a third factor (e.g., heredity) affected both parental and child expressivity. Second, our sample consisted primarily of Caucasian, middle-class children and their mothers. Therefore, it is unclear whether the same relationships would be found for fathers and/or in families from different social class, racial, or ethnic backgrounds. Third, in contrast to other studies (Eisenberg et al., 2001), mothers' observed and reported negative expressivity were not significantly related. One reason for the lack of correspondence may be that the observational task tapped primarily negative emotion directed at the child, whereas reported expressivity assessed mothers' negative expressivity in the family more generally. Direct exposure to the negativity may be one reason that children's reactions to the film were more consistently related to observed, rather than reported, negative expressivity. Another possible explanation for the discrepancy across measures of maternal expressivity is that the task used to assess observed parental negative emotion elicited only mild negative emotion and did not reflect the range of negative emotion that parents likely express (and might report) at home. Perhaps the relationship of mothers' expressivity to children's expressivity varies depending on the degree of mothers' intense and/or hostile emotions that are expressed. Regardless of the reason for the lack of association between observed and reported parental expressivity, both measures generally were positively predictive of children's facial distress (although the relation between observed maternal expressivity was significant at  $p < .10$ ). In the future, this line of research would benefit from more refined and evocative methods of assessing maternal expressivity. Finally, power to obtain findings may not have been large, not because of a small sample size, but rather because the conflict film—which concerned strangers and was only moderately evocative—might not have elicited much negative emotion in some children. This possibility may explain why some of the findings were of moderate strength. Stronger or more consistent relationships may be found by assessing children's emotional expressions in other contexts (e.g., during naturally occurring interactions).

## 5. Conclusions and implications

Although there are limitations, our data are consistent with a growing body of literature indicating that mothers' expression of emotion is related to children's experience and expression of emotion. Thus, given other findings indicating that children's ability to experience and express emotion in culturally and socially appropriate ways is related to their adjustment and social competence (Eisenberg et al., 1998; Halberstadt et al., 1999), it may be beneficial for parenting programs or interventions to focus on the level of parental negative emotion expressed in the home more generally, and not solely when directed toward the given child or in marital conflict. Activities designed to help parents express negative emotion in ways that can teach children about managing negative emotions may be especially helpful (Eisenberg & Fabes, 1998; Gottman et al., 1997; Hoffman, 2000). In addition, because parents' emotional expression is likely influenced by their child's behaviors, it may be beneficial to train parents to better identify their own attributions regarding their child's behaviors so that they can more fully understand their emotional reactions to their children.

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## References

Achenbach, T.M. Integrative guide for the 1991 CBCL/4-18, YSR, and TRF profiles. Burlington, VT: University of Vermont Department of Psychiatry; 1991a.

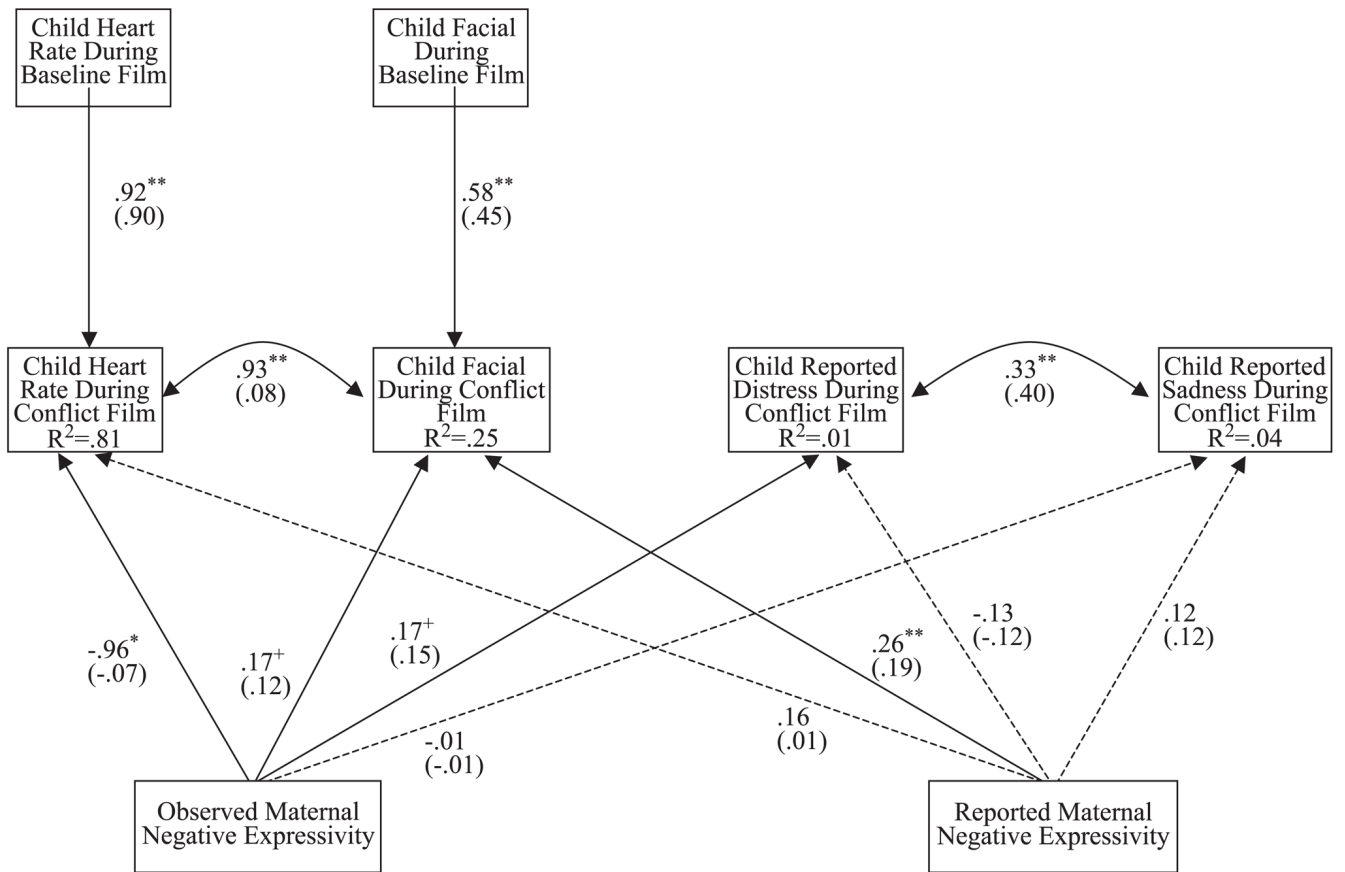
- Achenbach, TM. Manual for the child behavior checklist/4-18 and 1991 profile. Burlington, VT: University of Vermont, Department of Psychology; 1991b.
- Ballard ME, Cummings EM, Larkin K. Emotional and cardiovascular responses to adults' angry behavior and to challenging tasks in children of hypertensive and normotensive parents. *Child Development* 1993;64:500–515. [PubMed: 8477631]
- Barnett, KC.; Campos, JJ. A diacritical function approach to emotions and coping. In: Cummings, EM.; Greene, AL.; Karraker, KH., editors. *Lifespan developmental psychology: Perspectives on stress and coping*. Hillsdale, NJ: Erlbaum; 1991. p. 21-41.
- Brody GH, Ge X. Linking parenting processes and self-regulation to psychological functioning and alcohol use during early adolescence. *Journal of Family Psychology* 2001;15:82–94. [PubMed: 11322087]
- Buck, R. *The communication of emotion*. New York: Guilford Press; 1984.
- Bugental DB, Blue J, Cortez V, Fleck K, Rodriguez A. Influences of witnessed affect on information processing in children. *Child Development* 1992;63:774–786. [PubMed: 1505239]
- Burrowes BD, Halberstadt AG. Self- and family-expressiveness styles in the experience and expression of anger. *Journal of Nonverbal Behavior* 1987;11:254–268.
- Cacioppo JT, Sandman CA. Physiological differentiation of sensory and cognitive tasks as a function of warning processing demands and reported unpleasantness. *Biological Psychology* 1978;6:181–192. [PubMed: 667241]
- Cole PM, Michel MK, Teti LO. The development of emotion regulation and dysregulation: A clinical perspective. *Monographs of the Society for Research in Child Development* 1994;59(2–3):73–100. [PubMed: 7984169]
- Cole PM, Zahn-Waxler C, Fox NA, Usher BA, Welsh JD. Individual differences in emotion regulation and behavior problems in preschool children. *Journal of Abnormal Psychology* 1996;105:518–529. [PubMed: 8952185]
- Cooley EL. Family expressiveness and proneness to depression among college women. *Journal of Research in Personality* 1992;26:281–287.
- Craig KD. Physiological arousal as a function of imagined, vicarious, and direct stress experiences. *Journal of Abnormal Psychology* 1968;73:513–520. [PubMed: 5717351]
- Crandall VC, Crandall VJ, Katkovsky W. A child's social desirability questionnaire. *Journal of Consulting Psychology* 1965;29:27–36. [PubMed: 14277395]
- Cummings EM. Coping with background anger in early childhood. *Child Development* 1987;58:976–984. [PubMed: 3608667]
- Cummings EM, Ballard M, El-Sheikh M. Responses of children and adolescents to interadult anger as a function of gender, age, and mode of expression. *Merrill-Palmer Quarterly* 1991;37:543–560.
- Cummings EM, Davies P. Emotional security as a regulatory process in normal development and the development of psychopathology. *Development and Psychopathology* 1996;8:123–139.
- Cummings EM, Goeke-Morey M, Papp LM. A family-wide model for the role of emotion in family functioning. *Marriage and Family Review* 2003;34:13–34.
- Cummings EM, Iannotti RJ, Zahn-Waxler C. Influence of conflict between adults on the emotions and aggression of young children. *Developmental Psychology* 1985;21:495–507.
- Cummings EM, Vogel D, Cummings JS, El-Sheikh M. Children's responses to different forms of expression of anger between adults. *Child Development* 1989;60:1392–1404. [PubMed: 2612248]
- Davies PT, Cummings EM. Exploring children's emotional security as a mediator of the link between marital relations and child adjustment. *Child Development* 1998;69:124–139. [PubMed: 9499562]
- Davies PT, Myers RL, Cummings EM, Heindel S. Adult conflict history and children's subsequent responses to conflict: An experimental test. *Journal of Family Psychology* 1999;13:610–628.
- Denham SA. Maternal affect and toddlers' social-emotional competence. *American Journal of Orthopsychiatry* 1989;59:368–376. [PubMed: 2764071]
- Denham, SA. *Emotional development in young children*. New York: Guilford; 1998.
- Denham SA, Burger C. Observational validation of teacher rating scales. *Child Study Journal* 1991;21:185–202.



- Denham SA, Grout L. Mothers' emotional expressiveness and coping: Relations with preschoolers' social-emotional competence. *Genetic, Social, and General Psychology Monographs* 1992;118:73-101.
- Denham SA, Grout L. Socialization of emotion: Pathway to preschoolers' emotional and social competence. *Journal of Nonverbal Behavior* 1993;17:205-227.
- Denham SA, McKinley M, Couchoud EA, Holt RW. Emotional and behavioral predictors of peer status in young preschoolers. *Child Development* 1990;61:1145-1152. [PubMed: 2209184]
- Denham SA, Mitchell-Copeland J, Strandberg K, Auerbach S, Blair K. Parental contributions to preschoolers' emotional competence: Direct and indirect effects. *Motivation and Emotion* 1997;21:65-86.
- Denham SA, Renwick S, Holt RW. Working and playing together: Prediction of preschool social-emotional competence from mother-child interaction. *Child Development* 1991;62:242-249.
- Dunn J, Bretherton I, Munn P. Conversations about feeling states between mothers and their young children. *Developmental Psychology* 1987;23:132-139.
- Dunn J, Brown J. Affect expression in the family, children's understanding of emotions, and their interactions with others. *Merrill-Palmer Quarterly* 1994;40:120-137.
- Dunn J, Brown J, Beardsall L. Family talk about feeling states and children's later understanding of others' emotions. *Developmental Psychology* 1991;27:448-455.
- Dunsmore, JC.; Halberstadt, AG. How does family emotional expressiveness affect children's schemas?. In: Barrett, KC., editor. *The communication of emotion: Current research from diverse perspectives*. San Francisco: Jossey-Bass; 1997. p. 45-68.
- Eisenberg N, Cumberland A, Spinrad TL. Parental socialization of emotion. *Psychological Inquiry* 1998;9:241-273. [PubMed: 16865170]
- Eisenberg N, Fabes RA. Empathy: Conceptualization, measurement, and relation to prosocial behavior. *Motivation and Emotion* 1990;14:131-149.
- Eisenberg, N.; Fabes, RA. Prosocial development. In: Damon, W.; Eisenberg, N., editors. *Handbook of child psychology*. 5. Vol. 3. New York: Wiley; 1998. p. 701-778. Social, Emotional, and Personality Development
- Eisenberg N, Fabes RA, Bustamante D, Mathy RM, Miller PA, Lindholm E. Differentiation of vicariously induced emotional reactions in children. *Developmental Psychology* 1988;24:237-246.
- Eisenberg N, Fabes RA, Carlo G, Troyer D, Speer AL, Karbon M, Switzer G. The relations of maternal practices and characteristics to children's vicarious emotional responsiveness. *Child Development* 1992;63:583-602. [PubMed: 1600824]
- Eisenberg N, Fabes RA, Miller PA, Fultz J, Shell R, Mathy RM, Reno RR. Relation of sympathy and personal distress to prosocial behavior: A multimethod study. *Journal of Personality and Social Psychology* 1989;57:55-66. [PubMed: 2754604]
- Eisenberg N, Fabes RA, Miller PA, Shell R, Shea C, May-Plumlee T. Preschoolers' vicarious emotional responding and their situational and dispositional prosocial behavior. *Merrill-Palmer Quarterly* 1990;36:507-529.
- Eisenberg N, Fabes RA, Murphy B, Karbon M, Maszk P, Smith M, O'Boyle C, Suh K. The relations of emotionality and regulation to dispositional and situational empathy-related responding. *Journal of Personality and Social Psychology* 1994;66:776-797. [PubMed: 8189352]
- Eisenberg N, Fabes RA, Schaller M, Miller P, Carlo G, Poulin R, Shea C, Shell R. Personality and socialization correlates of vicarious emotional responding. *Journal of Personality and Social Psychology* 1991;61:459-470. [PubMed: 1941517]
- Eisenberg N, Gershoff ET, Fabes RA, Shepard SA, Cumberland AJ, Losoya SH, Guthrie IK, Murphy BC. Mothers' emotional expressivity and children's behavior problems and social competence: Mediation through children's regulation. *Developmental Psychology* 2001;37:475-490. [PubMed: 11444484]
- Eisenberg N, Lennon R. Sex differences in empathy and related capacities. *Psychological Bulletin* 1983;94:100-131.
- Eisenberg N, McCreath H, Ahn R. Vicarious emotional responsiveness and prosocial behavior: Their interrelations in young children. *Personality and Social Psychology Bulletin* 1988;14:289-311.

- Eisenberg N, Schaller M, Fabes RA, Bustamante D, Mathy RM, Shell R, Rhodes K. Differentiation of personal distress and sympathy in children and adults. *Developmental Psychology* 1988;24:766–775.
- Eisenberg N, Schaller M, Miller PA, Fultz J, Fabes RA, Shell R. Gender-related traits and helping in a nonemergency situation. *Sex Roles* 1988;19:605–618.
- Eisenberg N, Valiente C, Morris AS, Fabes RA, Cumberland A, Reiser M, Gershoff ET, Shepard SA, Losoya S. Longitudinal relations among parental emotional expressivity, children's regulation, and quality of socioemotional functioning. *Developmental Psychology* 2003;39:3–19. [PubMed: 12518805]
- Ekmann, P.; Friesen, WV. *Unmasking the face*. Palo Alto, CA: Consulting Psychologists; 1975.
- El-Sheikh M. Children's emotional and physiological responses to interadult angry behavior: The role of history of interparental hostility. *Journal of Abnormal Child Psychology* 1994;22:661–678. [PubMed: 7876455]
- El-Sheikh M, Cheskes J. Background verbal and physical anger: A comparison of children's responses to adult–adult and adult–child arguments. *Child Development* 1995;66:446–458. [PubMed: 7750376]
- El-Sheikh M, Cummings EM. Availability of control and preschoolers' responses to interadult anger. *International Journal of Behavioural Development* 1992;15:207–226.
- El-Sheikh M, Cummings EM, Goetsch VL. Coping with adults' angry behavior: Behavioral, physiological, and verbal responses in preschoolers. *Developmental Psychology* 1989;25:490–498.
- Fabes RA, Eisenberg N, Miller PA. Maternal correlates of children's vicarious emotional responsiveness. *Developmental Psychology* 1990;26:639–648.
- Gottman, JM.; Katz, LF.; Hooven, C. *Meta-emotion: How families communicate emotionally*. Mahwah, NJ: Erlbaum; 1997.
- Halberstadt AG. Family socialization of emotional expression and nonverbal communication styles and skills. *Journal of Personality and Social Psychology* 1986;51:827–836.
- Haberstadt, AG. Toward an ecology of expressiveness: Family socialization in particular and a model in general. In: Feldman, RS.; Rime, B., editors. *Fundamentals of nonverbal behavior*. New York: Cambridge University Press; 1991. p. 106-160.
- Halberstadt AG, Cassidy J, Stifter CA, Parke RD, Fox NA. Self-expressiveness within the family context: Psychometric support for a new measure. *Psychological Assessment* 1995;7:93–103.
- Halberstadt, AG.; Crisp, VW.; Eaton, KL. Family expressiveness: A retrospective and new directions for research. In: Philippot, P.; Feldman, RS., editors. *The social context of nonverbal behavior: Studies in emotion and social interaction*. New York: Cambridge University Press; 1999. p. 109-155.
- Hoffman, ML. *Empathy and moral development: Implications for caring and justice*. Cambridge, UK: Cambridge University Press; 2000.
- Kline, RB. *Principles and practices of structural equation modeling*. New York: Guilford; 1998.
- Muthen, LK.; Muthen, BO. *Mplus user's guide*. Los Angeles, CA: Muthen & Muthen; 1998.
- Plomin, R.; Stocker, C. Behavioral genetics and emotionality. In: Reznick, JS., editor. *Perspectives on behavioral inhibition*. Chicago: Chicago University Press; 1989. p. 219-240.
- Rassulo, J, producer. 8 short films about divorced dads. In: Braver, Sanford L., PhD, Principal Investigator, editor. *Dads for Life Intervention Program*. Arizona State University; Tempe, AZ: 1995.
- Spinrad TL, Losoya SH, Eisenberg N, Fabes RA, Shepard SA, Cumberland A, Guthrie IK, Murphy BC. The relations of parental affect and encouragement to children's moral emotions and behaviour. *Journal of Moral Education* 1999;28:323–337.
- Sroufe, LA.; Schork, E.; Motti, F.; Lawroski, N.; LaFreniere, P. The role of affect in social competence. In: Izard, CE.; Kagan, J.; Zajonc, RB., editors. *Emotion, cognition, and behavior*. Cambridge, England: Cambridge University Press; 1984. p. 289-319.
- Tabachnick, BG.; Fidell, LS. *Using multivariate statistics*. New York: HarperCollins; 1996.
- Thompson RA, Calkins SD. The double-edged sword: Emotional regulation for children at risk. *Development and Psychopathology* 1996;8:163–182.

- Valiente, C.; Eisenberg, N.; Fabes, RA.; Shepard, SA.; Cumberland, A.; Losoya, S. Prediction of children's empathy-related responding from their effortful control and parents' expressivity. 2002. Manuscript submitted for publication
- Winer, BJ. Statistical principles in experimental design. New York: McGraw-Hill; 1971.
- Zahn-Waxler C, Cole PM, Welsh JD, Fox NA. Psychophysiological correlates of empathy and prosocial behaviors in preschool children with behavior problems. *Development and Psychopathology* 1995;7:27–48.
- Zhou, Q.; Valiente, C.; Eisenberg, N. Empathy and its measurement. In: Lopez, SJ., editor. *Positive psychological assessment: A handbook of models and measures*. Washington, DC: American Psychological Association; 2003. p. 269-284.



**Fig. 1.** The predicted model with unstandardized estimates and standardized estimates (the latter in parentheses). Solid lines represent significant paths and the dotted lines represent hypothesized but nonsignificant paths.  $^+p < .10$ ;  $*p < .05$ ;  $**p < .01$ .

**Table 1**Mean (and *SD*) scores for major parent and child measures

<b>Variable</b>	<b><i>M</i></b>	<b><i>SD</i></b>
<i>Parent measures</i>		
Mothers' reported negative expressivity <sup>a</sup>	4.60	1.01
Mothers' observed negative expressivity <sup>a</sup>	0.95	0.30
<i>Child measures</i>		
Facial distress during baseline film	3.19	0.90
Facial distress during conflict film	3.03	1.15
Heart rate during baseline film	89.96	10.16
Heart rate during conflict film	88.90	10.56
Reported distress (average of nervous and scared)	2.06	0.94
Reported sadness (average of down, unhappy, sad, and upset)	2.54	0.89

*N*s range from 157 to 159.

<sup>a</sup>The unstandardized composites are presented in order to display the means; however the standardized composites were used in all analyses.

Table 2

Zero-order and partial correlations for mothers' negative expressivity and children's emotional reactions to a conflict film

Variable	1	2	3	4	5	6	7	8
(1) Mothers' reported negative expressivity		.04	.04	.22**	.13 <sup>+</sup>	.13	-.11	.12
(2) Mothers' observed negative expressivity	.04		.01	.13 <sup>+</sup>	-.16*	-.21**	.14 <sup>+</sup>	.00
(3) Facial distress during baseline film	.04	.01		.44**	.03	-.02	-.02	-.08
(4) Facial distress during conflict film	.22 <sup>a</sup> ,**	.14 <sup>a</sup> ,+	.44**		.08	.12	.01	-.06
(5) Heart rate during baseline film	.13 <sup>+</sup>	-.16*	.03	.07 <sup>a</sup>		.90**	-.09	-.03
(6) Heart rate during conflict film	.02 <sup>a</sup>	-.16 <sup>a</sup> ,*	-.12 <sup>a</sup>	.17 <sup>a</sup> ,*	.90**		-.08	-.05
(7) Reported distress	-.11	.14 <sup>+</sup>	-.02	.02	-.09	.01 <sup>a</sup>		.39**
(8) Reported sadness	.12	.00	-.08	-.03 <sup>a</sup>	-.03	-.05 <sup>a</sup>	.39**	

*N* ranges from 155 to 159. Zero-order correlations are presented above the diagonal and partial *r*s (controlling for baseline response when noted) are below the diagonal.

<sup>a</sup>Indicates that the coefficient is a partial *r* (the baseline response was partialled out).

<sup>+</sup> *p* < .10;

\* *p* < .05;

\*\* *p* < .01.