

## Emotion Regulation as a Mediator of Associations Between Mother–Child Attachment and Peer Relationships in Middle Childhood

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Although a link between attachment and peer relationships has been established, the mechanisms that account for this link have not been identified. The 1st goal of this study was to test emotion regulation as a mediator of this link in middle childhood. The 2nd goal was to examine how different aspects of emotion regulation relate to peer competence. Fifth graders completed self-report and semiprojective measures to index mother–child attachment, mothers reported on children's emotionality and coping strategies, and teachers reported on children's peer competence. Constructive coping was related to both attachment and peer competence, and mediated the association between attachment and peer competence, suggesting that emotion regulation is one of the mechanisms accounting for attachment–peer links. Constructive coping was more strongly associated with peer competence for children high on negative emotionality than for children low on negative emotionality.

According to attachment theory, the quality of parent–child attachments has implications for the nature of children's interactions and relationships with people outside the family, including peers (Bowlby, 1973; Sroufe & Fleeson, 1986). Numerous studies have confirmed a link between parent–child attachment and the quality of peer relationships. Attachment security in mother–child relationships (and, in some studies, father–child relationships) has been related to traitlike patterns of behavior around peers such as tendencies to be aggressive or sociable (Belsky & Cassidy, 1994; Lamb & Nash, 1989;

Lyons-Ruth, 1996), social competence and peer popularity (Kerns, Klepac, & Cole, 1996; Sroufe, Carlson, & Shulman, 1993), and the quality of children's friendships (Belsky & Cassidy, 1994; Kerns, 1996). However, little attention has been paid to documenting the processes or mechanisms through which parent–child attachment may influence children's peer relationships.

### Emotion Regulation as a Mediator of Attachment–Peer Links

Attachment theory postulates two mechanisms, both developed based on experiences in attachment relationships (Bowlby, 1973; Bretherton, 1987) that mediate links between attachment and peer relationships: working models, which are relationship rules (Main, Kaplan, & Cassidy, 1985) or schemas (Baldwin, 1992; Bretherton, 1987) that guide the processing of information in social interactions; and emotion regulation styles, which are characteristic strategies and behaviors used to modulate emotional arousal. Although some studies have examined whether working models of relationships account for attachment–peer linkages (Cassidy,

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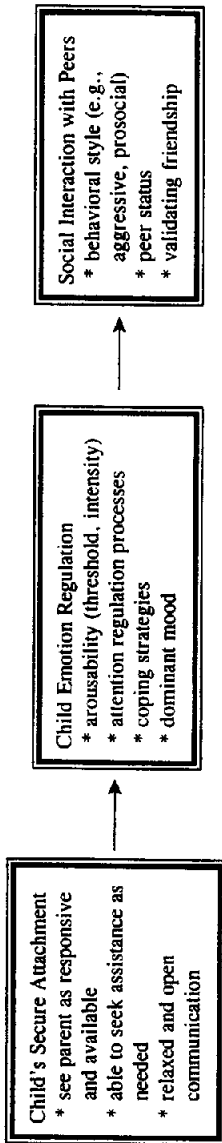


Figure 1. Model of links between attachment, emotion regulation, and social interaction with peers. From *Family and Peers: Linking Two Worlds*, by K. A. Kerns, J. M. Contreras, and A. M. Neal-Barnett, in press, Westport, CT: Greenwood/Praeger. Copyright by Greenwood/Praeger, an imprint of Greenwood Publishing Group, Inc, Westport, CT. Adapted with permission.

Kirsch, Scolton, & Parke, 1996; Sroufe et al., 1993; Tomich & Kerns, 1997), the possible mediating role of emotion regulation skills has not been studied. Thus, the goal of the present investigation was to test whether emotion regulation mediates the relation between mother-child attachment and peer relationships in middle childhood (see Figure 1).

Emotion regulation includes both "extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goals" (Thompson, 1994, p. 27). Intrinsic processes include temperamentally based emotional arousability and attentional control processes. Parental socialization practices are considered to be primary extrinsic processes influencing the development of emotion regulation. For example, how parents respond to their children's displays of negative emotion, and their availability to their child when he or she is upset, will affect what types of strategies children adopt to regulate their emotional states (Contreras & Kerns, in press).

Children's use of strategies to cope with emotion-eliciting events can be considered as an outcome of the emotion regulation process. Coping has been defined as efforts to manage external and internal demands that are appraised as taxing or exceeding the resources of the individual (Lazarus & Folkman, 1984). Coping is likely to be influenced by temperamental characteristics such as emotionality (i.e., tendency to experience emotional states intensely). For example, level of emotionality may affect the utility of particular coping strategies. Prior experience also influences children's choice of coping strategies. Children who have been consistently reinforced for seeking others when upset (i.e., had their emotional or instrumental needs met) are more likely to seek the support of others in subsequent upsetting situations.

The extent to which specific coping strategies are considered adaptive depends to some extent on both the developmental level of the child (Band & Weisz, 1988) and the level of control the child perceives over the event (Skinner & Wellborn, 1994). Nonetheless, strategies such as instrumental problem solving and support seeking can be considered constructive ways of coping, whereas other strategies such as avoidance and venting that address the evoked

emotion but not the eliciting event are thought to be less adaptive.

### Parent-Child Attachment and Emotion Regulation

For emotion regulation to mediate associations between parent-child attachment and peer relationships, it must be related to both. A link between attachment and emotion regulation is predicted by attachment theory. Emotion regulation is one of the functions of the attachment system in that children who are securely attached are able to use the parent effectively to help them regulate their emotions (Bowlby, 1982; Sroufe & Waters, 1977). Moreover, as described in a conceptual model of the mediating role of emotion regulation proposed by Contreras and Kerns (in press), parental characteristics and behaviors associated with the formation of secure attachments are related to the development of adaptive emotion regulation skills in children. For example, parents who are high on sensitivity and preference for open communication are likely to provide children models of effective emotion regulation that neither dismiss nor overemphasize certain families of emotions (Cassidy, 1994).

Attachment theory postulates further that the patterns of emotion regulation that operate within the parent-child dyad are internalized by the child and, in turn, displayed in other interpersonal contexts in the absence of the parent (Cassidy, 1994; Sroufe & Fleeson, 1986). Some empirical support has been gathered for this contention in that attachment has been found to be related to how affect is expressed and used in social interaction. For example, preschool children securely attached to their mothers are able to use positive affect to initiate, respond to, and sustain peer interaction, and display less negative affect than do insecurely attached children when playing with familiar peers (Sroufe, Schork, Motti, Lawroski, & LaFreniere, 1984). In addition, preschool secure-secure friend pairs show more positive affect during play than do secure-insecure friend pairs (Park & Waters, 1989). Attachment has also been related to the display of specific emotions. Lutkenhaus, Grossmann, and Grossmann (1985) found that securely attached preschoolers were more open about expressing sadness after failure in a competitive task than were avoidantly attached children. Thus, studies have examined

relations between attachment and children's expression of emotions. However, none of the earlier studies tap the processes used to manage emotions.

### Emotion Regulation and Social Behavior With Peers

There is also support for the relation between emotion regulation and children's relationships with peers. Emotion regulation skills are crucial for managing the various demands present in interpersonal situations, such as being able to resolve conflicts (Gottman & Mettetal, 1986). The ability to manage demands then influences the extent to which children are able to achieve social goals in a socially appropriate and effective way. Thus, conceptually, the ability to regulate emotions should be linked to success in relationships with peers. One of the ways this has been shown is that aspects of emotional competence (i.e., emotion recognition and expression and coping strategies) have been related to peer status. In reviewing the literature, Hubbard and Coie (1994) concluded that higher status children are better at reading and interpreting emotions and higher status boys use more constructive coping strategies, whereas rejected children are more moody and emotionally negative around peers.

In addition, emotion regulation has also been linked to children's behavior patterns around peers. In a number of studies, Eisenberg and colleagues (i.e., Eisenberg et al., 1995; Eisenberg, Fabes, et al., 1997; Eisenberg, Guthrie, et al., 1997) have demonstrated that emotion regulation measures are related to children's socially appropriate behavior. For example, children high on negative emotionality (i.e., tendency to experience negative emotion states) showed less appropriate social behavior at home and at school. The use of nonconstructive coping (e.g., use of aggression or venting) and difficulty regulating attention were also associated with less competent social behavior (Eisenberg et al., 1995; Eisenberg, Fabes, et al., 1997). There is also some evidence that the different components of emotion regulation interact to influence children's behaviors with peers. Specifically, level of negative emotionality appears to moderate associations between aspects of regulation (i.e., attentional control and behavioral regulation) and children's behaviors with peers. Regulation is more strongly associated

with socially appropriate behavior among children high on negative emotionality than for children low on negative emotionality (Eisenberg, Fabes, Karbon, et al., 1996; Eisenberg, Guthrie, et al., 1997).

### The Current Study

The general aim of the present study was to examine associations among mother-child attachment, emotion regulation, and peer competence in middle childhood. We chose to study children in this age range because emotional control is especially important for peer relationships during middle childhood (Parker & Gottman, 1989). In addition, few studies have examined attachment in middle childhood, and none has investigated emotion regulation as a mediator of attachment-peer linkages. We assessed emotion regulation in terms of the strategies children use to cope with upsetting events and their level of negative emotionality.

The first specific goal of this study was to test whether children's predominant coping strategies mediated the association between mother-child attachment and peer competence. To avoid the problem of shared method variance in testing mediation, we obtained independent assessments of the constructs in the model. Children provided responses to standard self-report and semiprojective measures to supply an index of attachment security from the perspective of the children, mothers provided reports of children's coping with upsetting events, and the children's primary teachers reported on children's competence with peers. Because dispositional levels of negative emotionality could account, at least in part, for the associations that both attachment and coping have with peer competence, we included mothers' reports of children's negative emotionality to rule out these potential effects.

We expected that our data would be consistent with a model in which attachment security is related to the development of adaptive emotion regulation skills (e.g., use of constructive coping strategies) in children, which in turn facilitate their interaction with peers. Given that we tested mediation within a cross-sectional sample, and thus could not draw conclusions regarding the directionality of the observed associations, we examined whether our data were also consistent with a model proposing a direction of influence different from that proposed in the mediational

model. Specifically, we tested whether the data were consistent with a model in which coping style is influenced by children's interactions with both parents and peers, rather than primarily by parent-child interactions, as is presumed in the proposed mediational model.

The second specific goal of this study was to examine further how different components of emotion regulation are related to peer competence. Specifically, we examined the interactive effect of negative emotionality and constructive coping on peer competence. Given that children who are prone to experience negative emotions frequently have a greater need to draw on their coping resources, we expected that the use of constructive coping would be more strongly associated with peer competence among children high on negative emotionality than among children who are low. Eisenberg and collaborators (Eisenberg, Fabes, Karbon, et al., 1996; Eisenberg, Guthrie, et al., 1997) have documented that negative emotionality can moderate relations between aspects of regulation (i.e., attentional control and regulation of the behavioral expression of emotions) and social functioning. However, no studies have examined interactive effects of negative emotionality and coping styles on peer competence.

## Method

### *Participants*

Participants for this study represented a subset of children who had participated in a study of parent-child relationships 2 years earlier. Of the original sample of 104 children, 74% ( $n = 77$ ) agreed to participate in the current study, 9% could not be located, and 17% declined participation. The data for 17 participants were later excluded from analyses because they did not have data from mothers ( $n = 2$ ) or teachers ( $n = 15$ ) as required for the present study. Two participants not part of the original sample also volunteered to participate in the current study. Thus, the final sample included 62 fifth graders (53% girls, 47% boys) for whom child, mother, and teacher data were available. Approximately 61% of the participating families were intact, 27% were mother-headed single-parent families, and 11% were step-father families. Mothers and fathers living in the target child's household were invited to participate. The average age of the participating children was 11.0 years, with a range of 9.9 to 11.8 years. The sample was 92% White, 3% African American, 2% Hispanic, and 3% of another ethnic origin. The average education of mothers was 15.2 years (range = 12.0 to

20.0), and the average education of fathers was 15.4 years (range = 11.0 to 20.0).

To test for selection effects, we compared participants from the original sample who returned for this study ( $n = 77$ ) with those who did not return ( $n = 27$ ) on demographic variables (i.e., child gender and race, family status, and parent education and employment). Only one significant association emerged: White children were more likely to return than were children from other ethnic backgrounds (78% vs. 46%). Analyses comparing participants for whom teacher data were available to those without teacher data indicated no differences on demographic variables or the composites used to index attachment, negative emotionality, and coping in the main analyses.

### Procedure

The data from parents and children were gathered during a single laboratory visit. Parents and children completed questionnaire measures of attachment, emotionality, and coping strategies, and behavioral tasks that are not part of this report. Because of the smaller number of participating fathers (39 fathers vs. 62 mothers), and thus lower power to detect effects, only mothers' reports of emotionality and coping were used for the main analyses. Fathers' reports were used to provide a check on the mothers' reports.

After the lab visit, the primary teachers of the children were contacted to fill out questionnaires of peer competence in the school context. Each participating child and parent received \$15, and participating teachers received \$10.

### Measures

#### Mother-Child Attachment

*Children's reports of attachment security.* To assess children's perceptions of attachment security, we had children complete the Security Scale (Kerns et al., 1996), a 15-item self-report questionnaire. Children completed this measure separately for each parent residing in their household. However, because a substantial number of children ( $n = 17$ ) did not reside with a father, only security with the mother was used in the analyses. Items on this scale are scored on a continuous dimension and assess children's perceptions of openness of communication, accessibility, and responsiveness with regard to a specific attachment figure. Items are presented in a format developed by Harter (1982) to minimize social desirability response biases. In this format, children are told that some kids respond one way, whereas other kids respond in a different way. Next, they are asked to indicate whether the response they chose is *really true* or *sort of true* for them. Example items include: "Some kids worry that their mom might not be there when they need her, but other kids are sure their mom will be

there when they need her" and "Some kids think their mom does not listen to them, but other kids think their mom listens to them." Each item was scored from 1 to 4 with higher scores indicating perceptions of greater security. A security score for the relationship with the mother was obtained by averaging responses across the 15 items. The internal consistency of this scale was good ( $\alpha = .82$ ). Construct validity has been demonstrated for the instrument. In a sample of preadolescents, children who reported a more secure attachment to their mothers were less lonely, better liked by peers as assessed through sociometric ratings, and more responsive and less critical with friends as assessed through observer ratings of friend dyads. In addition, the mothers of children who perceived a more secure attachment to them reported greater willingness to serve as a secure base (Kerns et al., 1996). Observed means and standard deviations for this and all measures are presented in Table 1.

*Children's state of mind with respect to attachment.* Children's state of mind with respect to attachment relationships was assessed with the Automated Separation Anxiety Test (ASAT), a semistructured projective interview adapted by Resnick (1993) for 10- to 14-year-old children from the Klagsbrun-Bowlby Separation Anxiety Test (Kaplan, 1985; Klagsbrun & Bowlby, 1976). This measure was included to tap unconscious beliefs about attachment

Table 1  
Means and Standard Deviations for Attachment, Emotion Regulation, and Peer Competence Variables

Variable	<i>M</i>	<i>SD</i>
Mother-child attachment (child report)		
Security with mother <sup>a</sup>	3.41	0.45
ASAT dismissing <sup>b</sup>	2.98	0.68
ASAT coherence <sup>b</sup>	5.17	0.81
Coping style (mother report)		
Avoidant coping <sup>c</sup>	3.02	0.42
Support seeking <sup>c</sup>	3.57	0.73
Verbal/physical aggression <sup>c</sup>	2.57	1.05
Decision making/problem solving <sup>c</sup>	3.32	0.67
Negative emotionality (mother report)		
Emotionality <sup>c</sup>	2.58	0.81
Emotional intensity <sup>d</sup>	4.80	0.87
Peer competence (teacher report)		
Peer skills <sup>e</sup>	3.68	0.92
Peer acceptance/popularity <sup>e</sup>	0.53	0.25

*Note.* This table presents individual variables prior to creating composites for analyses (for all composites  $M = 0$ ,  $SD = 1$ ). ASAT = Automated Separation Anxiety Test.

<sup>a</sup>Four-point scale. <sup>b</sup>Nine-point scale. <sup>c</sup>Five-point scale. <sup>d</sup>Seven-point scale. <sup>e</sup>Ranking/class size, range = .0-1.

that may not be tapped in traditional self-report measures. Participants were shown six pictures of separation situations (e.g., a child's parent being taken to the hospital in an ambulance) and, for each picture, were asked a series of closed- and open-ended questions regarding feelings about the situation and ideas about what will happen following the separation.

Children's interview responses are rated on nine scales, and the child is also given an attachment classification based on patterns of scores on the nine scales. The Resnick version of the ASAT is a relatively new measure of attachment with somewhat limited validity data. Some of the scales used to arrive at an attachment classification are unique to this measure (e.g., self-blame, displacement). For this reason, we a priori chose for analysis three of the nine 9-point continuous rating scales developed by Resnick that are well represented in the attachment literature and have been used to score other versions of the Separation Anxiety Test or the Adult Attachment Interview (Main & Cassidy, 1988): Dismissing/Devaluing of Attachment Relationships, Coherence of Discourse, and Emotional Openness.

Children's interview responses were recorded using a computer-assisted interview procedure and analyzed by a neural network that previously had been developed on over 200 hand-scored interviews. The computer generated scoring criteria (i.e., a mathematical algorithm) based on these previous cases, which were then used to score the interviews from the present study. In addition, the responses of 25 of the participants were hand scored by Gary Resnick and his assistants to estimate the reliability of the computer-generated rating-scale scores. Interrater reliability was calculated using gammas, a statistic designed for use with continuous variables that controls for chance agreement. Reliability for the three 9-point scales were as follows: Dismissing, .83; Coherence, .61; and Emotional Openness, .94. Although no validity data are available for these three scales, the ASAT classifications derived from all of the scales have been found to relate in conceptually meaningful ways to adolescents' self-perceptions (Martin, 1997) and to friendship quality (Resnick, 1997). Because of technical difficulties, ASAT data were not available for 3 of the 62 participants.

*Data reduction.* As expected, there were associations among the attachment variables and, therefore, we aggregated measures to derive a single index of attachment from the child's perspective. Coherence and Dismissing/Devaluing were significantly correlated,  $r(59) = -.43, p < .001$ , but Emotional Openness was not correlated with the other two scales (with Coherence,  $r[59] = .22, p < .10$ ; with Dismissing/Devaluing,  $r[59] = -.10, ns$ ). Thus, Emotional Openness was dropped and Coherence and Dismissing/Devaluing were aggregated to form an index of attachment representation. Children's perception of security with

mother and the representation composite were significantly correlated,  $r(59) = .39, p < .01$ . Therefore, both were standardized and averaged to form the measure of attachment used in all analyses (for the 3 children who did not have ASAT data, standardized security scores were used).

### *Children's Emotion Regulation*

Parents completed measures of children's coping and level of emotionality, the two aspects of emotion regulation assessed. Father reports, which were available for only a subset of the children, were used to provide an estimate of the validity of mother reports. Although children's emotional reactions and coping efforts may differ when they are around their mothers or fathers, we nonetheless expected some convergence between mothers' and fathers' perspectives because these constructs reflect traitlike characteristics of the children. The correlations between mother and father reports of coping and emotionality for those children who had both reports ( $n = 39$ ) are presented below in the relevant sections. Mother reports were used in the main analyses.

*Mothers' reports of children's coping strategies.* An adaptation of the Children's Coping Strategies Checklist (Eisenberg, Fabes, Karbon, et al., 1996; Program for Prevention Research, 1992) was used to obtain an index of children's predominant coping strategies. Using a 5-point scale, mothers were asked to rate how often their child does various types of behaviors when he or she is upset or is confronted with a problem (1 = *never*; 5 = *very often*). Types of coping strategies were grouped into the following: (a) avoidant coping (14 items), (b) emotion-focused or problem-focused support seeking (13 items), (c) use of verbal and physical aggression (2 items), and (d) cognitive decision making or problem solving (14 items). Example items for each type of coping strategy are as follows: "When my child is upset or has a problem, he/she: avoids thinking about the problem or attempts to ignore it (avoidant coping); tries to solve the problem by talking to others (emotion-focused or problem-focused support seeking); resolves problems through physical or verbal aggression, for example, pushes or kicks a child who has been mean to him/her (use of verbal and physical aggression); thinks about which things are best to do to handle the problem (cognitive decision-making or problem solving)." One score was computed for each of the four types of coping strategies by averaging responses across items. Alphas for mother reports on the four scales ranged from .74 to .92. Adequate validity has been reported for this measure. For example, parent report of constructive coping (i.e., support seeking and problem solving) was related to peer ratings of prosocial behavior (Eisenberg, Fabes, Karbon, et al., 1996).

**Data reduction.** The four coping strategies scales were intercorrelated. The magnitude of the correlations ranged from .19 to .54, and the direction of the correlations was consistent with prior studies (Eisenberg et al., 1993, 1995; Eisenberg, Fabes, et al., 1997). We subjected the four scales to a principal-components analysis. As expected given the level of intercorrelation among the four variables, all scales loaded onto one factor accounting for 51% of the variance. We extracted the resulting factor scores to index the child's predominant coping styles. Higher scores on this variable indicate greater reliance on constructive coping (support seeking and cognitive decision making or problem solving) and less reliance on avoidant or aggressive strategies. The factor score for mother and father reports were highly correlated,  $r(39) = .74, p < .0001$ , indicating substantial agreement between the parents.

**Mothers' reports of children's negative emotionality.** Mothers completed the five-item Emotionality Scale from the Emotionality, Activity, and Sociability Survey (EAS; Buss & Plomin, 1984). Using a 5-point scale, mothers were asked to rate how characteristic each description was of their child (1 = *not characteristic or typical of your child*, 5 = *very characteristic or typical of your child*). Example items include "child tends to be somewhat emotional" and "child gets upset easily." One score was computed by averaging across the five items, with higher scores indicating greater negative emotionality. The internal consistency was adequate ( $\alpha = .78$ ). In a longitudinal study of elementary school children, high emotionality in infancy and early childhood was related to high scores on anxiety/depression and attention problems for boys and to high scores on anxiety/depression for girls (Rende, 1993). In another longitudinal study, emotionality, as measured by the EAS, was the strongest temperamental predictor of behavior problems for children (Gjone & Stevenson, 1997).

**Mothers' reports of children's emotional intensity.** Mothers completed a shortened version of Larsen and Diener's (1987) Affective Intensity Scale (Eisenberg et al., 1993), a 10-item scale assessing the intensity with which children experience positive and negative emotions such as happiness, anxiety, anger, and upset. Each item is rated on a 7-point scale (1 = *never*, 7 = *always*). Example items include "When my child feels an emotion, either positive or negative, he/she feels it strongly" and "Even when happy, sad, or upset, my child does not get highly emotional." One score was computed by averaging across the items, with higher scores indicating greater emotional intensity. The internal consistency was adequate for mothers' reports ( $\alpha = .78$ ). Parents' and teachers' reports of emotional intensity have been found to be negatively related to preschoolers' social skills and peer status (Eisenberg et al., 1993) and to be negatively related to prosocial behavior in elementary

school children (Eisenberg, Fabes, Karbon, et al., 1996).

**Data reduction.** Mothers' reports on the Emotionality and Affect Intensity scales were correlated,  $r(62) = .67, p < .001$ . Thus, we created a composite variable by standardizing and averaging the two scales. Because the content of the scales addresses primarily negative emotions, we labeled the composite *negative emotionality* (i.e., frequency and intensity with which primarily negative emotions are felt). The mother and father composites were correlated,  $r(39) = .48, p < .01$ , suggesting moderate agreement between parents.

### Children's Peer Competence

Children in the sample were in different classrooms and school systems, and we did not have the resources to obtain peer ratings for the target children. As an alternative, we used teacher reports to index peer competence.

**Teachers' reports of children's peer relationships.** The Peer Skills subscale of the Teacher-Child Rating Scale (TCRS; Primary Mental Health Project, 1995) was used to obtain an index of children's competence with peers as reported by teachers (five items). The teacher is asked to rate each item according to how well it describes the child on a 5-point scale (1 = *not at all*, 5 = *very well*). Example items are "Child is well liked by classmates" and "Child makes friends easily." A scale score was computed by averaging across items ( $\alpha = .93$ ). Reported Cronbach alphas for all TCRS scales across five samples ranged from .85 to .95. Test-retest reliability, assessed in three samples over 10 and 20 week intervals, was high ( $r$ s ranged from .61 to .91; Primary Mental Health Project, 1995).

**Teachers' reports of children's peer competence.** Teachers ranked the target child relative to his or her classmates on peer competence (Sroufe, Egeland, & Kreutzer, 1990). Teachers were provided with descriptions of a child competent with peers as being well-liked and accepted by others, having social skills and leadership qualities, and having clearly identifiable, mutual friends. They rank ordered all of the students in a class on peer competence, with a ranking of 1 as the highest. To control for differences in class size, we divided the rankings by the number of children in the class. The resulting proportion was subtracted from 1 so that high scores indicate that the child received a high ranking from the teacher. Teacher rankings of peer competence have been shown to correlate with concurrent teacher reports of problem behaviors as well as with earlier assessments of the home environment (Sroufe et al., 1990).

**Data reduction.** The Peer Skills subscale from the TCRS and the peer competence ranking were highly correlated,  $r(62) = .73; p < .001$ . Thus, the

scores were standardized and averaged to create an overall peer competence variable.

**Results**

*Overview of Analyses*

We first describe preliminary analyses used to determine the need to include control variables in the main analyses testing mediation. Next, we present the correlations among the attachment, emotion regulation, and peer competence variables and analyses testing the proposed mediational model (i.e., coping as mediator of attachment-peer associations). We then describe analyses testing an alternative model (i.e., attachment and peer relationships as independent contributors to coping). Finally, analyses examining the interactive effect of negative emotionality and coping on peer competence are presented.

*Preliminary Analyses*

We first examined associations between the main variables (i.e., attachment, constructive coping, negative emotionality, and peer competence) and demographic variables (i.e., child age, gender, family status, and maternal and

paternal education). Only 2 of the 20 associations reached significance. Girls scored significantly higher than did boys on constructive coping,  $t(60) = -4.11, p < .001$ , and child age was negatively correlated with negative emotionality,  $r(62) = -.29, p < .05$ . Thus, we controlled for gender in analyses including coping and for age in analyses including negative emotionality.

*Constructive Coping as Mediator of Attachment-Peer Associations*

We tested the proposed model following Baron and Kenny's (1986) criteria for establishing a mediated relation. The first criterion indicates that the predictor variable (i.e., attachment), the criterion variable (i.e., peer competence), and the proposed mediator (i.e., constructive coping) should be intercorrelated. We computed the bivariate correlation between attachment and peer competence and the partial correlations (controlling for gender) of coping with both attachment and peer competence. As can be seen in Figure 2, all the relevant correlations were significant. Children who scored higher on the attachment composite, reflecting secure attachment, were rated by their

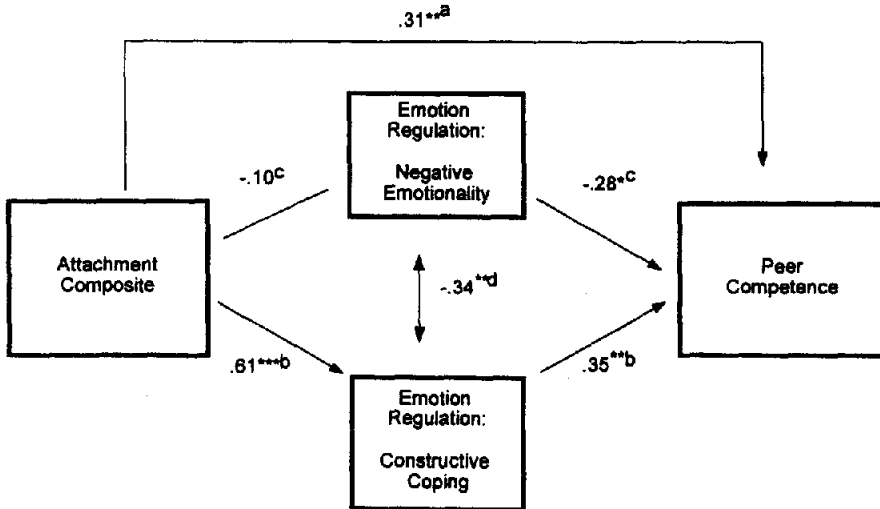


Figure 2. Correlations among attachment, constructive coping, negative emotionality, and peer competence ( $n = 62$ ). Values reported are bivariate and partial correlations that are presented schematically; they do not represent a test of the overall model. <sup>a</sup>Bivariate  $r$ . <sup>b</sup>Partial  $r$  controlling for gender. <sup>c</sup>Partial  $r$  controlling for age. <sup>d</sup>Partial  $r$  controlling for gender and age. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .



teachers as displaying greater peer competence. Attachment was also associated with constructive coping. Greater attachment security was associated with greater use of predominantly constructive coping strategies. Finally, constructive coping was positively correlated with peer competence, indicating that children who were described by their mothers as relying on constructive coping strategies were rated by their teachers as higher on peer competence. Thus, the first requirement for mediation was satisfied.

Children's dispositional level of negative emotionality was not correlated with attachment, but was related to both constructive coping and peer competence. Given these correlations, the significant association between coping and peer competence could have been due to their associations with negative emotionality. Therefore, prior to testing the second criterion for mediation, we computed the partial correlation between constructive coping and peer competence controlling for negative emotionality. Results indicated that coping was significantly associated with peer competence even after controlling for negative emotionality,  $pr(59) = .30, p < .05$ .

The second criterion for establishing a mediated relation indicates that the association between the predictor (i.e., attachment) and criterion variable (i.e., peer competence) should be substantially reduced when the effects of the mediator variable (i.e., constructive coping) on the criterion variable are controlled. To test this second requirement, we performed a hierarchical regression predicting peer competence (see Table 2). We entered gender on the first step, followed by constructive coping on the second

step and the attachment composite on the third step. Results indicated that, when entered at the third step, attachment did not account for a significant amount of variance above and beyond that accounted for by the coping variable. The partial correlation between attachment and peer competence, with the effects of constructive coping (and gender) removed, was substantially lower than the bivariate correlation between attachment and peer competence (.11 vs. .31). Thus, the second requirement was met.

### *Testing an Alternative Model: Attachment, Peer Relationships, and Emotionality as Independent Influences on Coping Styles*

The next set of analyses were undertaken to rule out the possibility that an alternative model would fit our data better than the one we proposed. Specifically, because of the bidirectional nature of the observed correlations, it could be that coping is influenced by experiences with both parents and peers, rather than primarily by parent-child relationships as our mediation model proposes. Thus, we performed a regression analysis predicting constructive coping from emotionality, attachment, and peer competence, entered simultaneously. We controlled for gender and child age because gender was related to coping and age was negatively correlated with negative emotionality (see above). In this model, peer competence did not have an independent contribution to the prediction of constructive coping ( $\beta = .10, ns$ ). The attachment composite ( $\beta = .49, p < .0001$ ) and negative emotionality ( $\beta = -.21, p < .05$ ) remained significantly associated with constructive coping. These results suggest that our data are not consistent with a model stating that children's coping style is jointly and independently determined by their experiences in relationships with parents and peers, at least as assessed here.

Table 2  
*Hierarchical Regression Testing Mediating Effect of Constructive Coping on Attachment-Peer Competence Associations*

Variable	$r^a$	$pr^b$	$\Delta R^2$	$\beta^b$
Step 1: Gender	.12	—	.01	.12
Step 2: Constructive coping	.36**	.34**	.12**	.39**
Step 3: Attachment composite	.31*	.11	.01	.14

Note. Overall  $R^2 = .14$ , adjusted  $R^2 = .10, p < .05$ .

<sup>a</sup>Bivariate correlation. <sup>b</sup>at entry.

\* $p < .05$ . \*\* $p < .01$ .

### *Interactive Effect of Negative Emotionality and Coping on Peer Competence*

In the final analysis, we tested the interactive effect of level of negative emotionality and constructive coping on peer competence. We computed a hierarchical regression predicting peer competence where child age and gender were entered on the first step. The main effects

for negative emotionality and coping were entered on the second step, prior to their interaction term, which was entered on the last step. Entry of the two main effects at Step 2 yielded a significant increase in predicted variance ( $R^2 = .15$ ,  $p < .01$ ), but only constructive coping contributed significantly to the prediction ( $\beta = .33$ ,  $p < .05$ ) when both variables were in the model ( $\beta$  for emotionality =  $-.19$ , *ns*). The addition of the multiplicative interaction term yielded a marginally significant increase in predicted variance ( $R^2 = .04$ ,  $p < .10$ ). To interpret this (marginally significant) interaction, we plotted the predicted values of peer competence, based on all variables in the regression, separately for those high (+1 *SD*) and low (-1 *SD*) on negative emotionality (see Figure 3). The figure shows that the association between constructive coping and peer competence was stronger for the high emotionality children. To examine this moderator effect in another way, we also divided the sample (at the median) into low and high negative emotionality groups and computed correlations between constructive coping and peer competence within each group. For children low on negative emotionality, coping was not related to peer competence,  $r(32) = .03$ , *ns*;  $pr(28) = .04$ , *ns*, controlling for age and gender. However, constructive coping was strongly related to peer competence among children high on negative emotionality,  $r(30) = .50$ ,  $p < .01$ ;  $pr(26) = .57$ ,  $p < .001$ , controlling for age and gender. Moreover,  $r$  to  $Z$  transformations and a signifi-

cance test indicated that the correlations across the two emotionality groups were significantly different ( $.50$  vs.  $.03$ ;  $Z = 1.95$ ,  $p < .05$ , one-tailed).

## Discussion

This study was designed to examine associations among measures of mother-child attachment, emotion regulation, and peer competence. We expected to find that more secure attachment would be associated with greater use of constructive coping strategies and higher peer competence. We also expected to find that children who use more constructive coping would be rated by teachers as higher in peer competence. Each of these linkages was confirmed in the present study. A strength of our findings is that those effects were shown with independent assessments of the three constructs.

We also tested whether our results are consistent with a model in which aspects of parent-child relationships are seen as influencing children's coping styles, which, in turn, influence their interpersonal behaviors with peers (Contreras and Kerns, in press). Of course, given the cross-sectional nature of our study, we could not confirm the direction of the observed associations, but we could test whether our results are consistent with a directional model. Although the attachment composite was significantly correlated with peer competence, it did not account for a significant percentage of variance on peer competence above and beyond that accounted for by constructive coping. Thus, constructive coping appeared to function as a mediator explaining the association between attachment and peer competence. These findings are especially strong given the lack of substantial evidence for variables that consistently mediate associations between family and peer variables. In a review of the literature, Mize, Pettit, and Meece (in press) found that very few studies testing family-peer mediators have produced significant mediator effects. They noted that findings are strongest in the literature for conceptually derived mediators and especially for emotion regulation. Thus, our finding that coping mediates the association between attachment and peer relationships may be due, in part, to our focus on emotion regulation, which was based on our conceptual analysis of attachment theory.

It is important to note that our data were not

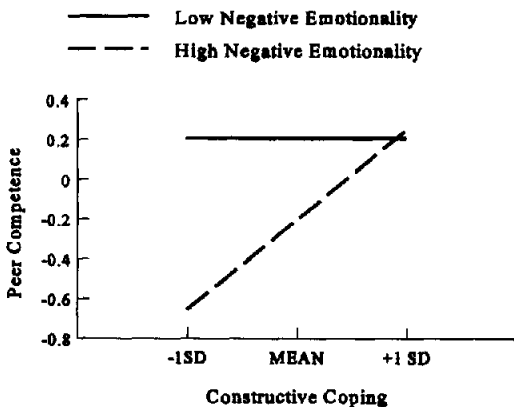


Figure 3. Illustration of the marginally significant interaction between constructive coping and negative emotionality on peer competence.

consistent with a model proposing an alternative directional influence. Specifically, we examined whether the data were consistent with a model in which constructive coping was an outcome influenced jointly or independently by parent-child and peer relationships, rather than a mediator between the two. This is a plausible model given that, by middle childhood, experiences with peers could significantly influence children's coping styles. However, regression results indicated that peer competence, as measured in this study, did not contribute independently to the prediction of constructive coping when the effect of attachment was also considered. Perhaps other measures of peer relationships may have independently contributed to the prediction of constructive coping. Future studies using a longitudinal approach are needed to confirm the direction of the associations among the constructs in the model.

Our results also indicated that coping style was not a full mediator of the observed association between our measures of mother-child attachment and peer competence. Although the direct path between attachment and peer competence was no longer significant when we controlled for constructive coping, it was not completely eliminated. Thus, constructive coping acted as a partial mediator. A more complete measurement of emotion regulation processes may have resulted in an even larger mediated effect. For example, children's reports of their own emotion regulation could be used to obtain a more complete assessment of these processes. Even then, however, it is likely that other variables also function as mediators of attachment-peer links. In particular, attachment theory postulates working models of relationships as a mechanism explaining this link (Bretherton, 1987), and a small number of studies have provided some support for this proposition (Cassidy, Kirsh, Scolton, & Parke, 1996; Sroufe et al., 1993). Thus, although we focused here on the role of emotion regulation, we see it as only one of the mediators of attachment-peer associations.

In our study, attachment was related to constructive coping and not to negative emotionality. Negative emotionality, a temperamentally based component of emotion regulation, is probably more influenced by innate factors than is coping style, which likely reflects a combination of both temperamental and learned aspects of emotion regulation. Following this reasoning,

one would not expect attachment to be related to all indices of emotion regulation, but would expect it to be related to components of emotion regulation that are shaped in the context of the parent-child relationship.

The second goal of our study was to examine how emotion regulation is related to children's peer competence. We tested the interactive effect of negative emotionality and constructive coping on children's peer competence. Consistent with prior studies (Eisenberg et al., 1995; Eisenberg, Fabes, et al., 1997), children who were described by their parents as displaying more negative emotionality were rated by teachers as displaying less competence in interactions with peers in the school setting. However, negative emotionality did not contribute independently to the prediction of peer competence when the effects of constructive coping were also considered, which is consistent with the findings of Eisenberg and collaborators (1993). Thus, both our study and earlier research suggest that children's ability to regulate their emotions and behaviors may be more important than their general level of negative emotionality in predicting teacher ratings of peer competence.

It is interesting to note that negative emotionality appeared to moderate the association between constructive coping and peer competence. Although this interactive effect was only marginally significant in our sample, examination of the correlations between constructive coping and peer competence for children high and low on negative emotionality indicated that constructive coping was significantly associated with peer competence only for children high on negative emotionality (respective  $r$ s = .50 and .03). This finding is consistent with prior studies that have documented interactive effects of negative emotionality and behavioral regulation (ability to modulate the behavioral expression of emotions) on children's social functioning (Eisenberg, Guthrie, et al., 1997) and problem behaviors at school (Eisenberg, Fabes, Guthrie, et al., 1996). The availability of constructive coping strategies is understandably more important for competent social behavior among children who experience negative emotions frequently, as they have a greater need to draw on these coping resources. Children who are not prone to experience frequent negative emotions may be able to sustain competent social behavior regardless of their predominant coping

style. Taken together, our findings for emotionality and constructive coping suggest that children high on negative emotionality do not necessarily experience problems in their peer interactions if they have developed constructive coping strategies.

The present study documented several associations among attachment, emotion regulation, and peer competence. Nevertheless, there are some limitations to the present study that need to be addressed in future research. The sample was primarily middle class and Caucasian, and the extent to which the findings are generalizable to other groups is not clear. Therefore, it is important to replicate the results of this study with larger and more diverse samples. A larger sample with sufficient numbers of participating fathers would also allow for the examination of the relative contribution of children's relationships with mothers and with fathers to their emotion regulation skills and competence with peers. The measure we used to assess children's attachment representations has somewhat limited validity data and we did not examine insecure attachment types. It would be important for future studies to expand the assessment of attachment to include insecure attachment types. An example of a measure that allows for the classification of secure, avoidant, preoccupied, and disorganized attachment types, and is appropriate for children in middle childhood, is a doll interview procedure adapted by Granot and Mayseless (1998) from Bretherton, Ridgeway, and Cassidy's (1990) story stem technique. The measurement of emotion regulation could be enhanced by obtaining the child's perspective in addition to parental reports. Finally, we relied on teacher reports of peer competence. Our assessment of peer relationships could be improved by obtaining peers' perceptions or measuring peer competence through observations of behavior with peers.

### Implications for Application and Public Policy

The present study also has implications for prevention and intervention programs designed to enhance children's family and peer relationships. School-based programs for children at risk for peer difficulties have traditionally relied on social skills training (Weissberg & Greenberg, 1998). The present findings indicate that their effectiveness would be enhanced by also including training for emotion regulation skills.

In addition, our findings suggest that emotion regulation training is likely to have the greatest impact for children high on negative emotionality. Thus, including assessments of negative emotionality would help identify those children who can most benefit from an emotion regulation prevention or intervention program.

Prevention programs for preschool children are generally family based. The effectiveness of these programs could also be enhanced by including a parenting component in which parents are taught ways they can foster their children's emotion regulation abilities. Our model (Contreras & Kerns, in press) suggests that this parenting component could include teaching parents how to focus on their children's underlying emotions, respond sensitively to their emotional signals, and communicate openly about emotions.

In sum, the findings of this investigation provide initial empirical support for the proposition that emotion regulation processes mediate associations between parent-child attachment and peer relationships. Constructive coping was significantly associated with measures of both attachment and peer competence, and statistically mediated the association found between attachment and peer competence. A strength of these results is that they were shown with independent assessments of the three constructs. In addition, we showed that coping is more related to peer competence for children high on negative emotionality than for children low on negative emotionality. Taken together, the findings suggest the need to explore further how emotion regulation processes may aid in explaining linkages between family and peer relationships.

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