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MATERNAL AND TEMPERAMENTAL INFLUENCES ON
CHILDREN'S EMOTION REGULATION

A Thesis

Submitted to the Graduate Faculty of the
University of New Orleans
in partial fulfillment of the
requirements for the degree of

Master of Science
In
Psychology

by

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B.A. Clemson University, 2003

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Abstract

Toddler-aged children are expected to shift from being solely dependent on parents to regulate their emotion (e.g., Fox & Calkins, 2003) to being able to independently regulate their emotions (Calkins & Johnson, 1998). Mothers' responses to children's negative emotions are expected to influence this development. Children's temperamental negative reactivity was found to moderate the effect of mothers' socialization attempts on children's regulatory behaviors, as suggested by previous theoretical and empirical work (e.g., Putnam, Sanson, & Rothbart, 2002; Rothbart & Bates, 1998). Specifically, highly negatively reactive children showed no correspondence between their mothers' attention-shifting strategies and their own attention-shifting regulation behaviors. This finding is consistent with the proposed process by which temperamentally reactive children become overaroused and unreceptive to mothers' socialization efforts (Hoffman, 1983; Scaramella & Leve, 2004). Lastly, children's reactivity did not moderate the effects of mothers' emotion-intensifying socialization on children's emotion-intensifying regulation behaviors, a finding which deserves further study.

Introduction

A growing body of research demonstrates that mothers' efforts to socialize children's emotion regulation influences children's actual use of regulatory behaviors (Eisenberg, Cumberland, & Spinrad, 1998; Grolnick & Farkas, 2002; Grolnick, McMenemy, & Kurowski, 1999; Calkins, 1997). Mothers have been found to play an active role teaching children emotional control (e.g., Denham, Mitchell-Copeland, Strandberg, Auerbach, & Blair, 1997); and over time children learn to cope autonomously with distress and frustration. An important next step in this line of research is to consider the influence of children's temperament on the relationship between mothers' efforts to socialize children's emotion regulation and children's actual use of regulatory strategies. Children's propensity to react with intense, negative emotion to novel or frustrating situations may interfere with mothers' efforts to socialize effective regulation (Eisenberg, Cumberland, & Spinrad, 1998). That is, more emotionally reactive children may be especially prone to react to mothers' socialization efforts with negative emotion. Conversely, less reactive children may be more likely to endorse strategies suggested by mothers because their negative emotions do not interfere with their ability to respond to their mothers (Scaramella & Leve, 2004).

The goal of the present study was to fill this research gap by examining the extent to which children's negative emotional reactivity moderates the association between mothers' efforts to socialize emotion regulation and children's use of emotion regulation strategies. As described by Cole, Martin, and Dennis (2004), interactions between mothers and children are characterized by emotional synchrony in which the emotions of each person guide and shape the continuing interaction. Optimally, mothers are expected

to be sensitive to children's emotional signals and respond in ways that reciprocate or modulate the child's emotions (Cole, et al., 2004) In the present study, mothers who respond to children's frustration or distress with emotion-focused or emotion-intensifying behaviors were expected to have children who use more emotion-focused/intensifying strategies. Similarly, mothers who respond to children's distress by shifting children's attention away from the source of their distress were expected to have children who were more able to use attention shifting strategies. These direct associations were expected to be influenced by children's propensity towards negative emotional reactivity. Highly reactive and emotionally negative children were expected to react more strongly to mothers' emotion-focused responses and to be less receptive to mothers' attention shifting strategies than less reactive children.

The study represents an important extension of previous work on mothers' socialization of emotion regulation by focusing on 2-year-old children of low-income, predominantly racial-minority mothers, a population rarely investigated in previous studies of emotion regulation. Only mothers were included in the study predominately because most research examining children's emotion regulation and socialization efforts relies exclusively on samples of mothers and children (e.g., Calkins & Johnson, 1998; Grolnick, Bridges, & Connell, 1996; Stansbury & Sigman, 2000). Moreover, fathers also are less frequently available than mothers in low-income, urban populations (Black, Dubowitz, & Starr, 1999). For these two reasons, the sample was restricted to only include mothers and their 2-year-old children.

The following sections will first detail the developmental importance of the early childhood period for socializing emotion regulation. Second, previous research on

emotion regulation and mothers' socialization of emotion regulation will be discussed. Third, the literature regarding children's negative emotional reactivity as a potential moderator of the relationship between mothers' socialization of emotion regulation and children's use of various regulatory strategies will be described. Finally, the hypotheses related to the current study will be outlined.

Developmental Importance of Early Childhood

Early childhood is marked by a number of cognitive, motor, and language achievements that coincide with greater expectations from parents for autonomous regulation of emotion and behavior (Cicchetti, Ganiban, & Barnett, 1991; Kopp, 1989; Kopp & Neufeld, 2003). Emotion regulation has been defined as the process of initiating, maintaining, or modulating emotional experience or expression in the service of one's goals (Eisenberg & Morris, 2002; Grolnick, McMenemy, & Kurowski, 1999). While infants rely almost exclusively on parental intervention for regulating emotions (Fox & Calkins, 2003), during the toddlerhood period children begin to understand the causes of their emotional distress and are motivated to change or eliminate the cause of distress (Diener & Mangelsdorf, 2000). Thus, the early childhood period is noteworthy in that children shift from being solely dependent on mothers for regulatory assistance to becoming capable of independently controlling their emotional expression (Calkins & Johnson, 1998). Early childhood is an important period in which to study children's emerging emotion regulation, as this is a time of growth and transitions which sets the foundation for later social and emotional adjustment.

Children's Emerging Emotion Regulation during the Toddler Period

Emotion regulation is often defined as a process whereby children use specific strategies to alter the experience or expression of their emotional arousal (Eisenberg & Fabes, 1999; Grolnick, McMenemy, & Kurowski, 1999). Children's emotion regulation is similar to, yet distinct from behavioral self-regulation, such as compliance. Compliance refers to the extent to which children adhere to a specific directive or rule (e.g., Whiting & Edwards, 1988), while emotion regulation is restricted to how children manage emotions (Eisenberg & Fabes, 1999). Both emotion regulation and compliance are likely affected by different parenting practices (Grolnick & Farkas, 2002).

Although definitions of emotion regulation are quite consistent across researchers, the specific strategies used to measure toddlers' emotion regulation vary widely. Some investigators restrict their study to distraction and comfort strategies, such as object-focused distraction, self-focused physical comforting, and other directed physical comforting (e.g., Grolnick, McMenemy, & Kurowski, 1999). Other investigators rely on avoidance, help seeking, and venting strategies, but exclude comfort strategies (e.g., self-soothing, comfort seeking) (e.g., Fabes & Eisenberg, 1992; Garner & Spears, 2000). Among researchers measuring children's emotion regulation during the toddler period (e.g., Calkins & Johnson, 1998; Eisenberg, Fabes, Murphy, Maszk, Smith, & Karbon, 1995; Grolnick, Bridges, & Connell, 1996; Stifter & Braungart, 1995) the following domains of strategies are most frequently identified:

- 1) Help/Proximity-seeking strategies are strategies that include children's attempts to gain the help or attention of caregivers by touching, reaching to, or vocalizing to the caregiver.

2) Self-soothing / Self-focused distraction strategies are defined as self-focused, physical comforting behavior. Examples include thumb sucking, hair twirling, visually examining one's self, and pulling or stroking clothing or other objects, like a blanket or stuffed toy.

3) Attention shifting strategies involve passive visual exploration, distraction, or active engagement with substitute objects. Children may ignore mothers' actions, play with a substitute or non-task toy, or play with toys in a non-task manner (e.g., stacking cups rather than putting them away during a cleanup task).

Children also may do simple, unfocused scanning or visual exploration of the room. These behaviors are aimed at finding, focusing on, or engaging stimuli other than the stressor.

4) Avoidance strategies are physical attempts to avoid the frustrating stimulus by removing oneself from the area or activity. Escape behaviors include walking, crawling or running away from the source of the distress in an attempt to reduce distress.

5) Venting strategies typically include statements of frustration, such as "No!" Venting also includes emotional outbursts that are not aggressive, such as screaming, yelling, or crying.

6) Aggression strategies typically include physical tantrums, stomping, or swinging arms, legs, or head violently. Aggression is typically directed at the source of frustration, (e.g., mother or the task-objects) and includes throwing objects and kicking or hitting mother or objects.

Each regulatory strategy varies in effectiveness. Help seeking, self-soothing, and attention shifting behaviors have been consistently found to be associated with reductions in emotional distress (Buss & Goldsmith, 1998; Calkins, 1997; Calkins, Gill, Johnson, & Smith, 1999; Grolnick, et al., 1996). In contrast, aggression and venting strategies are frequently linked to increases in negative emotionality and distress (Calkins, et al., 1999). Thus, children's early regulatory efforts may be best characterized as ranging from less-effective, emotion-intensifying strategies (e.g., venting and aggression) to more effective, distraction and attention shifting strategies. Less work has considered the effectiveness of avoidance. In all likelihood, avoidance may be more or less effective given the context in which the strategy is used. Emotion-intensifying regulatory strategies, such as venting and aggression, are expected to be associated with higher levels of emotional distress. In contrast, children's use of attention shifting strategies, including distraction and help-seeking strategies, are expected to be associated with lower levels of observed negative emotion. Learning and using these regulatory strategies, particularly the more effective, attention shifting strategies, is a primary task of early childhood.

Learning to control the expression of negative emotion during the toddler period has important implications for children's adjustment to preschool (Denham, et al., 1997). Specifically, children's ability to control angry emotions during frustrating events has been linked to the subsequent development of self-control (Kopp, 1982) and social competence (Rubin, Coplan, & Fox, 1995). In contrast, children who are unable to control their negative emotions have been found to experience more externalizing behavior problems, such as physical and instrumental aggression, during later developmental periods (Cole, Zahn-Waxler, & Smith, 1994; Rubin, Burgess, Dwyer, &

Hastings, 2003). Moreover, children's over-reliance on aggression or venting strategies has been associated with increases in acting out, aggression, impulsivity, and difficulty in peer interactions among older children (Calkins, 2002; Eisenberg, Fabes, Murphy, Maszk, Smith, & Karbon, 1995). Mothers may affect children's ability to learn autonomous and effective emotion regulation, the focus of the next section.

Mothers' Socialization of Emotion Regulation and Children's Regulatory Behaviors

Mothers play an important role in guiding and assisting their toddler-aged children with their first efforts to control negative emotions. Consistent with previous research, socialization of emotion regulation is defined as mothers' active responses to children's distress and includes a broad range of behaviors mothers use in response to children's negative emotional reactions (Eisenberg, Cumberland, & Spinrad, 1998). Like children's use of regulatory strategies, mothers' responses to children's distress may be grouped into two distinct categories: emotion-intensifying responses and attention shifting responses. Emotion-intensifying strategies increase children's distress and fail to teach emotional control, whereas attention shifting strategies teach children control and reduce arousal. The effects of emotion-intensifying responses will be discussed first, followed by attention shifting responses.

Emotion-intensifying strategies include mothers' responses that maintain children's focus on their negative emotion without offering assistance to reduce children's feelings of distress. Emotion-intensifying strategies often include mothers' behaviors that: focus children's attention on the desired object, increase children's negative or self-focused emotion, punish children's negative emotion, and minimize the legitimacy of children's emotional experience (Calkins, 1997; Calkins & Johnson, 1998; Eisenberg & Fabes,

1994; Eisenberg, Fabes, & Murphy, 1996; Grolnick, et al., 1996; 1999). Since emotion-intensifying behaviors direct children's attention to their feeling states rather than offer assistance reducing distress, emotion-intensifying strategies fail to teach children adaptive emotional control (Eisenberg, et al. 1998). Empirical research supports this conclusion; emotion-intensifying strategies have been associated with less constructive coping and more avoidant coping during peer conflict during later developmental periods (Eisenberg & Fabes, 1994; Eisenberg, Fabes, & Murphy, 1996).

In contrast to emotion-focused strategies, attention-shifting strategies are those that shift attention away from the cause of children's distress through distraction or soothing. Attention shifting strategies include: engaging children in other game-like activities, redirecting children's attention, reassuring or comforting children, and encouraging children to try an alternative coping strategy (Calkins, 1997; Calkins & Johnson, 1998; Eisenberg & Fabes, 1994; Eisenberg, Fabes, & Murphy, 1996; Grolnick, et al., 1996, 1999). Thus, while emotion-intensifying strategies intensify or maintain emotional arousal, attention-shifting strategies distract children away from the event or offer an alternative coping strategy thereby reducing distress. Mothers' who frequently use attention-shifting strategies are expected to increase children's ability to use more constructive emotion regulation (Eisenberg, et al., 1998).

Empirical research has demonstrated that attention-shifting strategies more effectively provide children with assistance reducing negative emotions than emotion-focused responses (Calkins & Johnson, 1998). Mothers who respond to children's distress with attention-shifting strategies are more likely to have toddlers who use adaptive strategies like distraction during frustrating situations (Calkins & Johnson, 1998). By

encouraging attention-shifting strategies that children can use independently, mothers facilitate the transition from other-reliant to self-reliant emotion regulation (Eisenberg & Morris, 2002). Mothers who are unable to facilitate children's transition toward independent, self-initiated regulation may undermine their children's efforts to develop and use effective self-regulatory strategies during mother-absent situations like school (Calkins, Smith, Gill, & Johnson, 1998; Grolnick, et al., 1999).

While mothers' behavioral responses to children's emotional distress likely influence children's emotion regulation efforts, children may vary in their responsiveness to feedback from mothers. Children's propensity towards negative emotional reactivity may influence mothers' socialization efforts. Children's negative emotional reactivity as a contributor to individual differences in children's emotion regulation behaviors now will be described.

The moderating effects of children's negative emotional reactivity on the association between mothers' socialization of emotion regulation and children's regulatory behaviors

Traditionally, temperament has been defined as constitutionally-based individual differences in both emotional reactivity and emotion regulation (Rothbart & Bates, 1998; Rothbart & Derryberry, 1981). Regulation, as described previously, refers to behavioral and cognitive strategies designed to modulate or control emotions. Emotional reactivity is defined as the intensity of emotional distress in response to novel events or frustrating situations (Fox & Calkins, 2003) and is considered to be a relatively stable individual characteristic (Rothbart & Derryberry, 1981; Rothbart, Derryberry, & Hershey, 2000).

A debate currently exists as to whether emotion regulation is a component of temperament or a distinct construct. Grolnick and colleagues (1999) argue for a

distinction between emotional reactivity and emotion regulation in part because the purpose of emotion regulation is to control the expression of reactivity. Thus, children's propensity towards negative emotional reactivity may influence children's need for regulation (e.g., Eisenberg & Fabes, 1992). Highly reactive children likely experience more affective arousal and may require more effort to modulate arousal than less reactive children (Scaramella & Leve, 2004). In contrast, less reactive children may have little need to regulate their emotions because they are rarely distressed. In the present investigation, emotional reactivity and regulation were hypothesized to represent distinct albeit related systems.

Although negative emotions may interfere with children's regulation efforts, strong negative emotional reactions may disrupt parenting (Putnam, Sanson, & Rothbart, 2002; Rothbart & Bates, 1998). Children who frequently react to novel situations with strong, negative emotions may be less responsive to mothers' socialization attempts because their emotional arousal interferes with attention processes (Hoffman, 1983). Consistent with this idea, toddlers who became distressed during frustrating tasks and use venting or aggressive behaviors were found to attend to their mothers less and miss mothers' attempts to provide assistance coping with negative emotions (Calkins & Johnson, 1998). Thus, children who react to frustration with quick and intense negative emotions provide mothers with a brief window of opportunity to intervene before reaching an overaroused and unreceptive state (Hoffman, 1983; Scaramella & Leve, 2004).

Mothers' may experience more difficulties assisting children regulate their emotions when children react to frustration with intense distress. When mothers react to

children's distress with strategies that focus on children's emotion, rather than on the cause of children's distress, children may learn to respond to feelings of distress with venting or aggression (Fabes, Leonard, Kupanoff, & Martin, 2001). For instance, if mothers' respond to children's distress with harsh physical responses (e.g., hitting) or destructive coping (e.g., verbal threats and taunts), children may be more likely to adopt emotion-focused or intensifying strategies, like venting or aggression, when distressed. Conversely, mothers' attempts to shift children's attention away from the source of distress may be less successful when children are more distressed.

In contrast, less reactive children likely need to regulate their emotions less frequently. Children who do not exhibit frequent and intense negative emotions are less likely to evoke negative emotions from mothers; consequently, mothers maybe able to respond more planfully (e.g., Scaramella & Conger, 2003). Additionally, children less prone to negative emotional reactivity may provide more opportunities for mothers to provide assistance while their distress is still at manageable levels (Scaramella & Leve, 2004). This combination of fewer instances of emotional overarousal and slower increases in emotional arousal may provide mothers with more opportunities to shift children's attention away from the source of distress and keep children's arousal at low levels.

Goals of the Current Study

The current study was designed to examine how mothers' behaviors and children's reactivity propensities affect children's use of socially competent emotion regulation. Consistent with previous work, mothers' socialization strategies were expected to predict children's use of emotion regulation strategies. Moreover, children's negative emotional

reactivity was expected to moderate the association between mothers' and children's emotion regulation. Specifically, the following hypotheses were evaluated:

1) Mothers' use of emotion-intensifying emotion regulation strategies will be positively and statistically significantly correlated with the frequency of children's use of venting/aggression and avoidance emotion regulation.

2) Mothers' use of attention shifting emotion regulation strategies will be positively and statistically significantly correlated with the frequency of children's use of verbal distraction, other distraction, and proximity seeking emotion regulation.

3) Children's negative emotional reactivity will interact with mothers' socialization of emotion regulation strategies such that:

a) Mothers who use more emotion-intensifying strategies will have children who use more venting/aggression and avoidance strategies only when children are more emotionally reactive.

b) Mothers who use more attention shifting strategies will have children who use more verbal distraction, other distraction, and proximity seeking strategies only when children are less emotionally reactive.

Methods

Participants

Fifty-five mothers with a child enrolled in Head Start and a 2-year-old child were recruited and only mothers and their 2-year-old children participated. Data collected from 53 mothers and children (34 girls) are included in the present report because the

data from the remaining two families were not coded in time to be included.

Demographic information is summarized in Table 1. Participating families were predominantly African American, although European American families and families of Indian/Middle Eastern descent also were represented (see Table 1). As described in Table 1, most mothers were single and the average family size was 4.9 members. Since having a child enrolled in Head Start was a requirement for participation, families were very low income and family income averaged \$13,737 a year. The average per capita income was \$3,166 per person.

Table 1.
Demographic information of participating families

	Mean (<i>SD</i>)	Range
Mother Age	26.3 (5.1) years	18 – 40 years
Child Age	24.4 (1.5) months	19.5 – 29.4 months
Household Size	4.9 (1.8)	1 ^a - 10
Income	\$13,737 (\$10,648)	\$0 – \$46,966
Per capita income	\$3,166 (\$3,086)	\$0 - \$15,655
<u>Race/Ethnicity (Percent in each group)</u>		
African American	83.6%	
White	14.5%	
Hispanic or Latina	4.2%	
Indian/Middle Eastern	1.8%	
<u>Family Composition (Percent in each group)</u>		
Single, never married	47.3%	
Married	34.5%	
Separated	12.7%	
Widowed	3.6%	
Divorced/unmarried	1.8%	

^aMothers may not live in the same house as their children for 4 or more days per week.

Procedures

Mother-child dyads were recruited through collaboration with the West Bank Head Start (WBHS) center, which enrolled approximately 600 3- to 5-year-old children annually. Participants were recruited through the Head Start parent orientation meetings, phone calls, and letters. Attempts were made to contact all children enrolled in the WBHS. Approximately 65% of families were contacted, and all eligible families agreed to participate. Mothers and children participated in an in-person assessment occurring within 2 months of the target child's second birthday. Due to scheduling challenges, seven families were scheduled outside of that assessment window. All interviews occurred either at the WBHS center or at the family's home. Mothers received a \$50 Winn-Dixie or Wal-Mart gift certificate for participating, and children received a small toy.

Before beginning the interview, one research assistant (interviewer) reviewed the assessment procedures and obtained informed consent from mothers. At the same time, a second research assistant (cameraperson) set up the video equipment for the interview. After the consent forms were signed, the video camera was turned on and remained on for the entire observational portion of the assessment. Children completed a number of structured activities, some of which included mothers; all activities were videotaped. During and after the observational portion of the interview, mothers completed a booklet of questions about family income, family background, parenting practices, and their children's behavior. Assessments lasted approximately two hours, with the videotaped portion that included children lasting only one hour. At the end of the interview, the

interviewer and cameraperson completed an impressions form rating emotional characteristics of children and mother-child interactions.

Two of the interactional tasks are relevant for the present report and will be described. First, mothers and children completed the gentle arm restraint task (e.g., Goldsmith, Reilly, Lemery, Longley, & Prescott, 1999) to measure variations in children's emotional distress. During this task, children were presented with an attractive telephone toy with buttons and sounds. After children played with the toy for 30 seconds, mothers were instructed to hold children's arms gently but firmly to their sides so that children could not break free. After 30 seconds of restraint, mothers released children and children played with the toy for another 30 seconds. The restraint and release sequence occurred twice.

Second, a waiting activity was used to measure mothers' socialization of emotion regulation behaviors and children's emotion regulation behaviors. After mothers and children completed a fun interactive activity involving a set of attractive toys, interviewers removed all the toys from the room. Mothers were told to resume work on the questionnaire but were given no instructions regarding what children should do. Interviewers only instructed mothers and children not to leave the room until interviewers returned. Interviewers left the room for 5 minutes and returned with supplies for the next activity.

Later, trained coders rated the duration and intensity of children's emotional reactivity observed during the gentle arm restraint task using the Temperament Coding Procedures (Scaramella, 2002) coding system. Trained graduate and undergraduate research assistants marked the onset and termination of mutually exclusive categories of

distress vocalizations observed during the arm-restraint task using the Observational Coding system (OCS; Triangle Research Inc., 2003). Distress vocalizations included: 1) no distress/ambiguous distress or any vocalizations that that were not clearly negative or positive, 2) mild distress, or children's clear whines or non-rhythmic cries; and 3) moderate/high distress, defined as clear sustained cries or screams. Distress vocalizations less than 3-seconds in duration were not coded.

For all observational coding, coders were required to mark the occurrence of the targeted behavior within three seconds of one another to be considered in agreement on that code. Measuring inter-coder reliability as agreement within a three second window tends to produce over-conservative estimates of inter-coder reliability. Reliability was assessed on a code-by-code basis with Cohen's kappas computed by the OCS software. If two coders achieved a .75 kappa on a given code, for example destructive coping, this means that for 75% of the destructive coping instances, the coders marked the occurrence of destructive coping within three seconds of each other. Kappa coefficients were computed for the onset and termination of each level of distress and the occurrence of each regulatory behavior.

Before beginning to code children's distress, coders received at least 10 hours of training, had to pass a written exam, and were required to achieve a .80 reliability score as rated by Cohen's kappa. To monitor inter-rater agreement, 25% of all gentle arm restraint tasks were coded twice by two different coders. Inter-rater reliability estimates were very good for mild distress ($K = .86$) and moderate/high distress ($K = .93$).

A separate team of trained coders were used to measure mothers' socialization of emotion regulation and children's use of emotion regulation. Coders rated mothers' and

children's behavior using the Emotion Regulation Coding System (Mirabile, Scaramella, & Sohr-Preston, 2005), a coding system that was developed for this study. The first step in developing this coding system was to review existing coding procedures and identify the most frequently coded behaviors. Initially, attempts were made to include all mother and child behaviors previously coded by other researchers (e.g., Calkins, 1997; Calkins & Johnson, 1998; Eisenberg & Fabes, 1994; Eisenberg, Fabes, & Murphy, 1996; Grolnick, et al., 1996; 1999). Preliminary efforts were unsuccessful. A number of previously reported behaviors did not occur during the pilot coding period (e.g., mothers' cognitive restructuring behaviors or emotion labeling). Some maternal socialization behaviors used in other research, such as strategies used when an object is the source of frustration (e.g., instrumental coping, focus on the distressing object) simply were not applicable to the task; thus these codes were not included in the final coding manual. Variations in observed mothers' and children's use of regulatory behaviors may reflect the cultural, economic, and developmental characteristics of the present sample as well as task related variations in observed behavior. The pruning effort resulted in the inclusion of four mother codes (e.g., destructive coping, harsh physical, verbal distraction, and physical soothing) and five child codes (e.g., venting/aggression, avoidance, verbal distraction, other distraction, and proximity seeking).

Coders received 75 hours of training, had to pass a written exam, and were required to achieve a .80 reliability score as rated by Cohen's kappa before coding began. Scoring interactions involved marking the occurrence of the 4 mother behaviors and second marked the occurrence of the 5 child behaviors. To monitor inter-rater agreement, 25% of all waiting tasks were double coded. Trained coders were quite

consistent in their ratings of mothers' emotion-intensifying behavior and fairly consistent in their ratings of mothers' attention shifting behaviors (see Table 2). Trained coders were moderately consistent in their ratings of children's emotion regulation (see Table 2).

Table 2
Means (Standard Deviations), Ranges, and Reliability Coefficients of Variables

	Mean (<i>SD</i>)	Range	Reliability
Children's Negative Emotional Reactivity			
Observer ratings	7.97 (10.59)	.00 – 34.09	<i>k</i> = .90
Mothers' Emotion-Intensifying Strategies			
Observed Emotion-Intensifying Composite	1.28 (2.39)	.00 – 11.00	<i>k</i> = .92
Observer ratings: Destructive coping	.87 (1.47)	.00 – 6.00	<i>k</i> = .94
Observer ratings: Harsh physical	.42 (1.06)	.00 – 5.00	<i>k</i> = .89
Mothers' Attention Shifting Strategies			
Observed Attention Shifting Composite	9.62 (9.92)	.00 – 37.00	<i>k</i> = .67
Observer ratings: Verbal distraction	8.49 (9.12)	.00 – 37.00	<i>k</i> = .62
Observer ratings: Physical soothing	1.13 (1.90)	.00 – 10.00	<i>k</i> = .73
Children's Emotion-Intensifying Strategies			
Observer ratings: Venting/Aggression	1.23 (2.19)	.00 – 10.00	<i>k</i> = .67
Observer ratings: Avoidance	2.62 (3.48)	.00 – 15.00	<i>k</i> = .67
Children's Attention Shifting Strategies			
Observer ratings: Verbal distraction	11.21 (13.65)	.00 – 58.00	<i>k</i> = .75
Observer ratings: Other distraction	28.72 (14.01)	10.00 – 72.00	<i>k</i> = .57
Observer ratings: Proximity seeking	1.60 (1.73)	.00 – 8.00	<i>k</i> = .72

Measures

Observational coding was used to measure children's negative emotional reactivity, mothers' socialization of emotion regulation, and children's use of emotion regulation strategies. The means, standard deviations, and reliability estimates are reported for all indicators in Table 2 and are described in the text. First, measures of children's negative emotional reactivity will be described. Next, the strategy used to

measure mothers' emotion-intensifying and attention shifting socialization strategies will be described. Finally, measures of children's emotion regulation will be discussed.

Children's negative emotional reactivity. Observational ratings of children's distress derived from the arm restraint task were used to measure children's negative emotional reactivity. To increase variability in distress scores, both mild and moderate/high codes were used. On average children were in mild distress for about 6% of the task (SD = 8.4) and in moderate/high distress for about 2% of the task (SD = 5.6). The standard deviations indicate some variability around these means. The observed negative emotional reactivity score was computed by summing the two proportion scores. Thus, the observed negative reactivity score measures the total proportion of time children spent in mild to high distress. The average proportion of time spent in distress was 8%. Since this score was skewed, the log transformation of the score was used in the statistical analyses (Cohen, Cohen, West, & Aiken, 2003; Tabachnick & Fidell, 2001). The non-transformed score is reported in Table 2 for ease of understanding.

Socialization of emotion regulation: Mothers' emotion-intensifying strategies. Two observer ratings of maternal behaviors were used to measure mothers' emotion-intensifying strategies: destructive coping and harsh physical behaviors. Destructive coping included mothers' verbal threats, teases, and derogation of their children, while harsh physical behaviors involved any sharp, painful, or negative physical interaction initiated by mother (see Appendix A). Twenty-five percent of the interactions were double-coded to measure interrater reliability. Intraclass correlation coefficients computed from the double coding indicated very strong agreement (destructive coping: $k = .94$; harsh physical: $k = .89$).

On average, mothers used 0.7 destructive coping behaviors (SD = 1.4) and 0.4 harsh physical behaviors (SD = 1.1) during the five-minute observation period. These emotion-intensifying strategies were statistically and significantly correlated ($r = .77, p < .01$). A total emotion-intensifying score was created by summing the destructive coping and harsh physical scores to create an overall frequency of mothers' use of emotion-intensifying strategies (M = 1.1, SD = 2.4). The mean and standard deviation indicates that emotion-intensifying strategies were used infrequently; there was variability in the overall frequency of using emotion-intensifying strategies.

Socialization of emotion regulation: Mothers' attention-shifting strategies. Two codes were used to measure mothers' attention-shifting strategies: verbal distraction and physical soothing behaviors. Verbal distraction included each instance of mothers' non-task related talking or asking questions to children (see Appendix A). Such verbal distractions include mothers' efforts to engage children in conversation unrelated to the activity of waiting. Physical soothing included mothers' warm, physical contact-oriented behaviors designed to comfort children (see Appendix A). Intraclass correlation coefficients computed from the double coding indicated moderate to strong agreement (verbal distraction: $k = .62$; physical soothing: $k = .73$). Mothers used on average 7.9 verbal distractions (SD = 8.9) and 1.2 physical soothing behaviors (SD = 1.9) during the waiting task. The frequency of using verbal distraction and physical soothing were statistically and significantly correlated ($r = .30, p < .05$). An observed attention-shifting score was created by summing the verbal distraction and physical soothing ratings (M = 9.1, SD = 9.7). In general, mothers used attention-shifting strategies at an approximate rate of 2 per minute, although these rates varied considerably.

Children's emotion-intensifying regulation. Two codes were used to measure children's use of emotion-intensifying strategies observed during the waiting task. Definitions of each code are included in Appendix A. Coders marked each instance of children's use of venting/aggression, which included physical tantrums and angry verbal expressions of frustration or distress. Coders also rated children's avoidance behaviors which included running, walking, or crawling away from the task activity. Intraclass correlation coefficients computed using the 25% double coded ratings indicated moderate agreement (venting/aggression: $k = .67$, avoidance: $k = .67$). Children used on average 1.3 venting/aggression behaviors (SD = 2.3) and 2.5 avoidance behaviors (SD = 3.4) during the waiting task. In other words, children used emotion-intensifying strategies at a rate of about one every 75 seconds. Children's venting/aggression and avoidance scores were not statistically significantly correlated ($r = -.13$), thus analyses were computed separately for each behavior.

Children's attention-shifting emotion regulation. Three codes derived from the waiting task were used to measure children's use of attention-shifting strategies (see Appendix A). These codes were designed to measure children's ability to distract themselves during the 5-minute waiting episode. Verbal distraction measured children's vocalizations with mothers. Other distraction included undirected vocalizations and playing with objects or their own body. Proximity seeking behaviors involved children's physical bids for attention from mothers, like reaching to or walking to mothers. Children varied in their use of attention-shifting strategies. Intraclass correlation coefficients indicated good consistency across coders (verbal distraction: $k = .75$; other distraction: $k = .57$; proximity seeking: $k = .72$). Children used other distractions most

frequently ($M = 28.3$; $SD = 14.4$) and verbal distraction less frequently ($M = 10.8$; $SD = 14.6$). Children rarely used proximity seeking behaviors ($M = 1.7$; $SD = 1.8$). None of these three scores were statistically significantly correlated with one another, thus analyses were computed separately for children's attention shifting emotion regulation strategies.

Results

The results are presented below in three sections. First, since regression analyses were used to test study hypotheses, preliminary analyses were computed to evaluate whether variables met the assumptions of regression procedures. Preliminary analyses also were computed to evaluate the potential influence of children's age and gender. Finally, results of the hypothesis testing will be described separately for each hypothesis.

Preliminary Data Analyses

The amount and pattern of missing data posed no threats to the assumptions of the regression model. Data were analyzed for univariate and multivariate outliers using methods suggested by Tabachnick and Fidell (2001). Four multivariate outliers were found, and in accordance with suggestions by Tabachnick and Fidell (2001), the contributing variables were standardized. Standardized variables yielded identical correlation and regression coefficients as unstandardized variables, so the unstandardized variables were used in all subsequent analyses, unless otherwise noted. Multicollinearity of variables also was assessed, and no two variables in the analyses were correlated highly enough to cause multicollinearity problems.

Children's Age and Gender

Previous research suggests that mothers' socialization of emotion regulation and children's regulatory behavior may vary by children's gender (e.g., Weisenberg, Schwarzwald, Waysman, Solomon, & Klingman, 1993; Zimmerman & Stansbury, 2003). For instance, Zimmerman and Stansbury (2003) found that three-year-old girls used more comforting behaviors than boys. Additionally, mothers have been found to encourage independence and discourage affection in their sons (Lamb, Ketterlinus, & Fracasso, 1992), and to inhibit their daughters' expression of anger (Radke-Yarrow & Kochanska, 1990). Analysis of variance procedures were used to evaluate whether the means and variances of study constructs varied significantly by children's gender. Results indicated no statistically significant mean-level differences in the study constructs by children's gender.

Next, considerable variability existed in the age at which children participated. As children age, mothers expect them to transition from less advanced strategies like self-soothing to more sophisticated strategies like distraction (e.g., Stansbury & Zimmerman, 1999); thus, both mothers' expectations and children's regulatory efforts are expected to vary with children's age (e.g., Cicchetti, Ganiban, & Barnett, 1991; Kopp, 1989; Kopp & Neufeld, 2003). Due to children's wide age range (19.5–29.4 months), child age was correlated with all study constructs. Child age was only statistically significantly correlated with observer ratings of mothers' emotion-intensifying socialization ($r = .32, p < .05$) and its constituent codes (destructive coping: $r = .32, p < .05$; harsh physical: $r = .28, p < .05$). Consequently, children's age was entered as a control variable in all

regressions. The next section describes the results of the hypothesis testing, unless otherwise stated, an alpha level of .05 was used for all statistical analyses.

Hypothesis 1: Mothers' and children's emotion-intensifying strategies

Mothers' use of emotion-intensifying strategies was expected to be correlated with children's use of venting/aggression and avoidance strategies such that mothers' who used more emotion-intensifying strategies would have children who were observed to use more venting/aggression and avoidance. Two sets of correlations were computed. First, the composite mother emotion-intensifying socialization score was correlated with children's use of venting/aggression and avoidance. Second, the individual mother emotion-intensifying scores, destructive coping and harsh physical, were correlated with children's use of venting/aggression and avoidance. As shown in Table 3, observer ratings of mothers' emotion-intensifying strategies were positively and statistically significantly correlated with children's use of venting/aggression ($r = .61, p < .001$), but not with children's use of avoidance.

Next, individual mother ratings were correlated with children's observed venting/aggression and avoidance scores. As shown in Table 3, observer ratings of mothers' destructive coping were positively and statistically significantly correlated with children's use of venting/aggression ($r = .54, p < .01$) as were observer ratings of mothers' harsh physical behavior ($r = .63, p < .01$). Like the composited observer score, the individual indicators of mothers' observed emotion-intensifying strategies were unrelated to children's use of avoidance. Taken together, results suggest that mothers' use of emotion-intensifying strategies was related to children's use of venting/aggression but not their use of avoidance.

Table 3

Correlations between Mothers' Socialization, Children's Regulation, and Children's Reactivity.

	Child Variables					
	Venting/ Aggression	Avoidance	Verbal Distraction	Other Distraction	Proximity Seeking	Negative Emotional Reactivity
Observed Emotion- Intensifying Composite	.61**	-.13	.29*	-.03	-.12	.15
Destructive Coping	.54**	-.20	.35**	-.02	-.10	.15
Harsh Physical	.63**	-.02	.16	-.03	-.13	.14
Observed Attention- Shifting Composite	.26 ⁺	.08	.65**	-.09	.22	.34*
Verbal Distraction	.25 ⁺	.06	.65**	-.03	.21	.34*
Physical Soothing	.13	.12	.25 ⁺	-.30*	.12	.14
Child Negative Emotional Reactivity	.05	.14	.10	.08	.24 ⁺	1.00

⁺ $p < .10$, * $p < .05$, ** $p < .01$ (2-tailed).

Hypothesis 2: Mothers' and children's attention-shifting strategies

Following the same procedures used to test hypothesis 1, a series of correlations were computed to evaluate the extent to which mothers' use of attention-shifting strategies was associated with children's use of similar regulatory behaviors (e.g., verbal distraction, other distraction, and proximity seeking). First, correlations between mothers' attention-shifting composite score and children's specific behaviors were computed. Next, correlations among the individual indicators (i.e., distraction and physical soothing) of mothers' attention shifting regulation and children's observed attention shifting behaviors were computed.

As shown in Table 3, observer ratings of mothers' use of attention shifting strategies were positively and statistically significantly correlated with children's use of verbal distraction ($r = .65, p < .001$), but not other distraction or proximity seeking. Mothers' use of verbal distraction was statistically and significantly associated with children's use of verbal distraction ($r = .65, p < .01$), but not with children's use of other distraction or proximity seeking (see Table 3). Mothers' use of physical soothing was positively and marginally statistically significantly correlated with children's verbal distraction ($r = .25, p < .10$), indicating that mothers who soothed more had children who talked with them more. Mothers' physical soothing was statistically significantly associated with less other distraction by children ($r = -.30, p < .05$). Surprisingly, mothers' use of physical soothing behaviors was unrelated to children's proximity seeking behaviors (see Table 3).

Taken together, the results of the correlation analyses indicate that mothers' use of emotion-intensifying or attention-shifting regulation strategies are differentially associated with children's use of specific regulation strategies. No observer ratings of mothers' strategies were statistically and significantly correlated with children's use of avoidance or proximity seeking behaviors, thus children's use of avoidance and proximity seeking behaviors were excluded from further analyses.

Hypothesis 3: The moderational affects of children's negative emotional reactivity

Children's negative emotional reactivity was expected to interact with mothers' use of emotion-intensifying and attention-shifting socialization to affect children's use of similar regulation strategies (i.e., venting/aggression, verbal distraction, or other distraction). To test the expected moderating effect of children's reactivity on the

association between mothers' socialization and children's use of specific emotion regulation strategies, a series of multiple regression equations were computed. In the first step of each equation, children's age (statistical control), children's reactivity, and mothers' specific regulation were entered. In the second step, an interaction term, computed by multiplying the specific maternal regulation strategy and children's reactivity, was entered. Although predictors are commonly centered before they are entered into regression equations, Cohen et al. (2003) suggest that predictors with meaningful zero points be left uncentered. All observer-reported socialization scores were left uncentered because observer-reported scores are frequency counts with meaningful zero points.

Hypothesis 3a. Children's reactivity will moderate the association between mothers' use of emotion-intensifying strategies and children's use of venting/aggression regulation. The results of the regression equation considering observer ratings of mothers' emotion-intensifying strategy use are summarized in Table 4. Results indicated that only the beta associated with the main effect of mothers' emotion-intensifying socialization on children's venting/aggression was statistically significant ($\beta = .61, p < .01$). No statistical evidence for moderation emerged as the beta associated with the interaction term was not statistically significant and the step did not account for statistically significant portions of the variance explained by the model. The model accounted for 37% of the variance in children's venting/aggression behavior, $F(3, 43) = 9.71, p < .001$.

Table 4

Hierarchical Regression Analysis for Variables Relating to Children's Venting/Aggression Emotion Regulation (N = 53)

	Venting/Aggression		
	ΔR^2	F_{ch}	B
Step 1	.37**	9.72**	
Child Age			-.03
Negative Emotional Reactivity			.04
Observed Mother Emotion-Intensifying			.62**
Step 2	.00	.00	
Reactivity*Intensifying Interaction			.00
Overall R^2 : .37			

⁺ $p < .10$, * $p < .05$, ** $p < .01$

Hypothesis 3b: Reactivity as a moderator of the association between mothers' use of attention-shifting strategies and children's use of verbal distraction and other distraction. Children's negative emotional reactivity was expected to interact with mothers' use of attention-shifting socialization of emotion regulation to affect children's use of attention-shifting regulation strategies. Two multiple regression equations were computed; children's use of verbal distraction and other distraction were used as dependent variables in the two equations. These results are summarized in Table 5.

Table 5

Hierarchical Regression Analyses for Variables Predicting Children's Attention Shifting Emotion Regulation Strategies (N = 53)

Variable	Verbal Distraction			Other Distraction		
	ΔR^2	F_{ch}	β	ΔR^2	F_{ch}	β
Step 1	.46**	13.81		.03	.46	
Child Age			.10			.07
Negative Emotional Reactivity			-.17			.11
Mother Attention Shifting			.79**			-.10
Step 2	.06*	5.90*		.00	.16	
Reactivity*Attention Shifting			-.26*			-.06
Interaction						
Overall R ² : .52; .03						

⁺ $p < .10$, * $p < .05$, ** $p < .01$

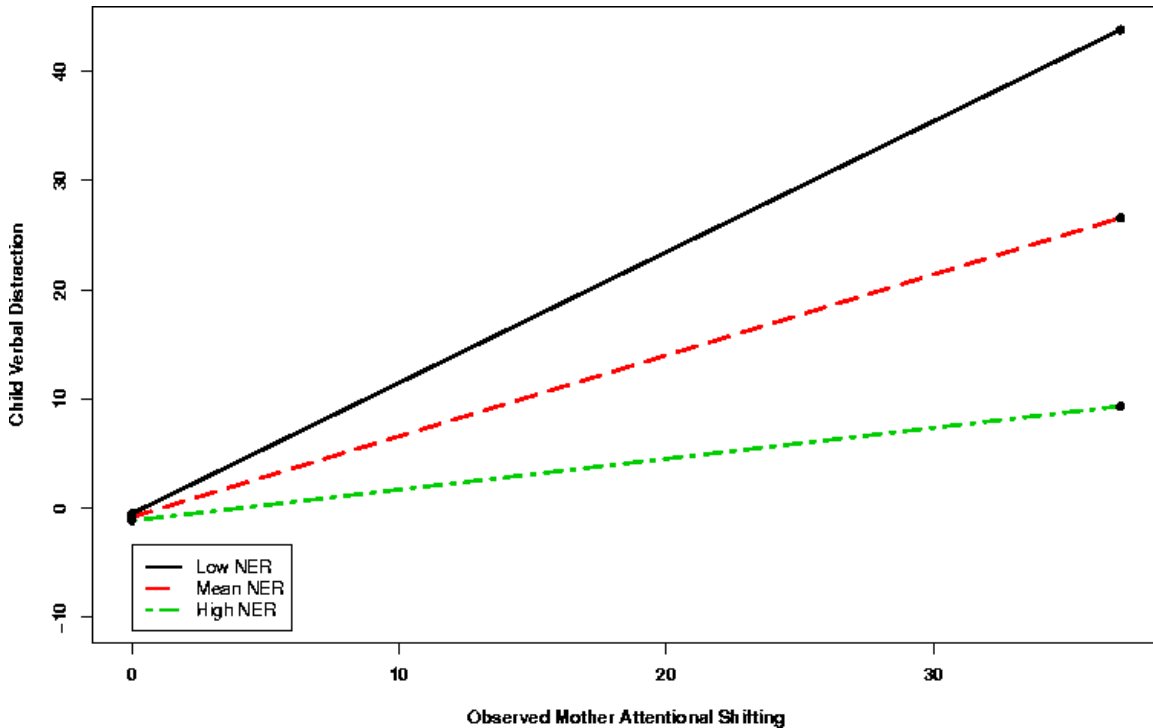
Children's verbal distraction regulation. The main effects of children's age, emotional reactivity, and mothers' attention-shifting socialization accounted for 46% of the variance in children's use of verbal distraction. Only the beta associated mothers' attention-shifting socialization accounted for significant portions of the variance ($\beta = .78$, $p < .01$). As shown in Table 5, the beta associated with the interaction term was statistically significant and accounted for an additional 5% of the variance left unexplained by the main effects. The overall model was statistically significant.

To decompose the statistical interaction, internet-based graphing software written by R Development Core Team (2004) and made available by Preacher, Curran, and Bauer (2003) was used. The graphing procedures were based on the work of Aiken and West (1991) and Cohen et al. (2003). As suggested by Cohen et al. (2003), simple slopes were calculated to estimate the effect of mothers' attention-shifting socialization on

children's verbal distraction regulation at three different levels of children's negative emotional reactivity: low (mean-1 SD), mean, and high (mean + 1SD). A graphical representation of the interaction effect is presented in Figure 1. Consistent with expectations, as the frequency of mothers' attention-shifting socialization increases, less emotional reactive children were found to use more verbal distraction than children high in negative emotional reactivity. In other words, at low levels of negative emotional reactivity, mothers' attention shifting socialization is positively related to children's use of verbal distraction; while for more emotionally reactive children, mothers' attention-shifting socialization was unrelated to children's use of verbal distraction.

Figure 1

Interaction of Attention-Shifting Socialization of Emotion Regulation and Children's Negative Emotional Reactivity in Relation to Children's Verbal Distraction Emotion Regulation



Note. All units are frequency counts. Low NER = 1 SD below the mean of children's negative emotional reactivity. Mean NER = the mean of children's negative emotional reactivity. High NER = 1 SD above the mean of children's negative emotional reactivity.

Children's other distraction regulation. The same regression procedures were used to evaluate the model in terms of children's other distraction emotion regulation. Regarding the main effects, only the beta associated with children's emotional reactivity was marginally statistically significant, suggesting that more reactivity was associated with using slightly more other distraction. Contrary to expectations, the interaction term did not account for significant portions of the variance associated with other distraction (see Table 5).

Discussion

Achieving independent regulation of emotion is a primary task of childhood. The goal of the present investigation was to examine the relations among mothers' socialization of emotion regulation, children's reactivity, and children's emotion regulation during the toddler period. The present study extends existing research on socialization of emotion regulation by studying these basic developmental processes among an understudied population, economically disadvantaged, African American families. Based on prior theoretical and empirical work, the association between mothers' attempts to socialize toddler-age emotion regulation and children's actual use of those strategies was expected to be conditioned by children's propensity towards negative emotional arousal. The implications of the hypothesis testing, both in terms of the expected concordance of mothers' and children's behavior and the moderating effects of children's reactivity propensities will be described first. Methodological issues associated with the measurement of mothers' socialization attempts and children's observed emotional regulation will be discussed next. Finally, strengths and limitations of the study as well as future research directions will be considered.

Concordance between Mothers' Socialization of Emotion Regulation and Children's Use of Regulatory Behaviors

Previous theoretical and empirical work suggests that children learn emotion regulation largely through interactions with their mothers and are likely to adopt regulatory strategies similar to those used by their mothers (Calkins & Johnson, 1998; Denham, et al., 1997; Eisenberg, et al., 1998). Consistent with this expectation, the type of emotion regulation used by mothers' was expected to affect the likelihood that children

would use the same strategy. Two different domains of regulatory behaviors were considered, emotion-focused regulation and attention-shifting regulation. The domains of regulation vary in effectiveness. Emotion-focused strategies either maintain or intensify children's negative emotional arousal while attention-shifting strategies divert children's attention away from the source of distress and more effectively reduce children's distress. Thus, the manner in which mothers' respond to children's emotional distress may affect the type of strategies children use to independently cope with their distress.

Considering the associations between mothers' and children's use of emotion-intensifying strategies, mothers' observed use of emotion-intensifying socialization was statistically and significantly correlated with children's use of venting/aggression but not with avoidance. Importantly, the two observational indicators of emotion-intensifying socialization, destructive coping and harsh physical socialization, functioned in the same way as the composited score. Consistent with previous research (Fabes, et al., 2001), mothers who were observed to use emotion-intensifying behaviors had children who were more likely to use venting/aggression; but mothers' emotion-intensifying socialization was unrelated to children's avoidance.

Another interesting finding occurred with children's use of avoidance. Children's use of avoidance was unrelated with mothers' observed emotion-intensifying socialization or attention-shifting socialization. Avoidance also was unrelated to children's observed negative emotional reactivity; in other words, highly reactive and less reactive children were equally likely to walk away from the waiting area and the room. Although avoidance is typically considered a less effective strategy because children do not directly cope with their emotions (e.g., Krohne, Pieper, Knoll, & Breimer, 2002), how children

come to use avoidance is not well understood. In the present study, avoidance was measured by children's wandering away from the waiting area. One possible explanation for the lack of any statistical association between avoidance and mothers' socialization of emotion regulation has to do with the validity of the avoidance score. The operational definition of avoidance used in the present study is consistent with previous research and measured children's physically walking away from a stressful situation. However, a waiting task may not be stressful enough to evoke avoidant behavior. Avoidance typically is measured during conflict situations. For instance, given a situation in which two children want the same toy and one child walks away, the child who walks away could be coded as using avoidance. Leaving a context in which children have nothing to do does not clearly reflect avoiding a stressor; instead, such children may be actively searching for another activity (e.g., other distraction). Future studies would benefit from using multiple activities to measure each coping strategy more effectively.

In addition to considering concordance between mothers' and children's use of emotional-intensifying strategies, concordance between mothers' and children's use of attention-shifting behaviors also was expected. Mothers' observed attention-shifting behavior was only correlated with one of the identified child attention-shifting behaviors, children's use of verbal distraction. Mothers' observed attention-shifting composite was created from two indicators, mothers' use of verbal distraction and physical soothing and the results of the associations between the specific indicators will be discussed.

Decomposing the observed attention-shifting composite score indicated concordance between mothers' and children's use of verbal distraction. Mothers who used more verbal distraction had children who used more verbal distraction. Surprisingly,

mothers' use of verbal distraction was not related to children's ability to play independently (i.e., other distraction) or to seek comfort from mothers. Understanding the content of mothers' and children's conversations may shed important light on this finding. Perhaps mothers are not providing children with suggestions for alternative activities, but rather mothers are engaging children in conversation.

Next, mothers' use of physical soothing was expected to be associated with children's attention shifting regulation. The work of Calkins and Johnson (1998) provided the rationale for this expectation. Namely, mothers who responded to children's distress with physical soothing were found to have children who were better able to play independently (i.e., other distraction). Calkins and Johnson (1998) concluded that physical soothing may be effective in reducing children's distress and increasing children's ability to independently self distract. In direct contrast to the work of Calkins and Johnson (1998), mothers' physical soothing was not associated with children's proximity seeking behavior and was associated with less use of other distraction by children. One possible explanation is that the children's bids for comfort are not recognized by mothers or that mothers are less easily distracted by children's physical proximity. That is, mothers were instructed to continue to work on their questionnaires while children waited with nothing to do. Children's physical proximity to mothers may not sufficiently distract some mothers from their assigned task. The possibility that the intensity of children's distress affects the likelihood that mothers' use emotion-intensifying or attention-shifting socialization also was considered and will be described next.

Children's propensity towards emotional distress was expected to moderate associations between mothers' and children's emotion regulation. In order to evaluate the

moderational hypotheses, associations between children's emotional reactivity and mothers' and children's regulation were examined. Observer ratings of mothers' use of emotion-intensifying strategies were unrelated to children's observed emotional reactivity. Perhaps emotion intensifying strategies have a greater effect over time but are less associated with children's emotional distress in the moment. Consistent with this notion, Scaramella, Sohr-Preston, Robison, Mirabile, and Callahan (2005) found that mothers' observed harsh parenting responses to 12-month-old children's noncompliance predicted statistically significant increases in children's observed emotional reactivity from 12 to 24 months.

In contrast, children's emotional reactivity was positively associated with observed attention-shifting socialization. Quite possibly, mothers' are less likely to respond to general instances of children's distress with attention-shifting strategies when children are less prone to bouts of negative emotional reactivity. However, when mothers of more emotionally reactive children find themselves in a public situation in which their children are distressed, as in the waiting task, these mothers may be more likely to use attention shifting strategies as a way of reducing children's distress. The results of the moderational hypotheses are consistent with this interpretation and will be described next.

Children's Emotional Reactivity as a Moderator of the Association between Mothers' Socialization Strategies and Children's Emotion Regulation

Recent empirical and theoretical work has highlighted the possibility that children's emotional reactivity may influence parenting (e.g., Putnam, Sanson, & Rothbart, 2002). Specifically, mothers' attempts to socialize emotion regulation may be

influenced by the reactivity propensities of their children (e.g., Calkins & Johnson, 1998; Eisenberg, et al., 1998; Hoffman, 1983; Scaramella & Leve, 2004). The results of the present study only partially support these expectations. Children's use of avoidance and proximity seeking behaviors were excluded from these analyses because neither construct met the necessary criteria for moderation (e.g., was not associated with mothers' socializing behaviors). The results of the emotion intensifying moderational analyses will be discussed first, followed by a discussion of the attentional shifting analyses.

Contrary to expectations, children's negative emotional reactivity did not moderate the association between mothers' emotion-intensifying socialization and children's use of venting/aggression in the current study. Although highly reactive children were expected to respond more intensely to mothers' emotion-intensifying socialization than less reactive children, the results suggest that mothers' use of harsh physical behaviors and destructive coping increase children's risk for using venting/aggression regulation regardless of their reactivity propensities. Consequently, children's use of emotion-intensifying regulation does not seem to depend on their reactivity level, but rather, such behavior may be learned during interactions with mothers. The possibility that emotion-intensifying socialization is equally likely to affect aggression/venting regulation in children of differing reactivity levels deserves additional empirical attention.

Consistent with expectations, children's reactivity moderated the association between mothers' and children's use of verbal distraction (see Table 5 and Figure 2). For highly reactive children, mothers' use of attention shifting strategies was unrelated to children's use of verbal distraction. For less reactive children, mothers' verbal distraction

was associated with children's use of verbal distraction. Simply put, highly reactive children were unlikely to engage in verbal distraction (e.g., conversation) with their mother during a stressful task; whereas less reactive children were highly likely to engage in reciprocal verbal exchanges during the waiting task. These findings are consistent with Scaramella & Leve (2004) and Hoffman (1983) arguments; emotional over-arousal likely interferes with children's efforts to attend to mothers and to learn strategies to autonomously regulate their emotional arousal. Consistent with these findings, toddlers who become distressed during frustrating tasks and use venting or aggressive behaviors have been found to attend to their mothers less and to miss critical opportunities to receive assistance from their mothers (Calkins & Johnson, 1998). When these mother-child exchanges during frustrating episodes are understood as a foundation of mothers' socialization of emotion regulation (e.g., Spinrad, Stifter, Donelan-McCall, & Turner, 2004), highly negatively reactive children may be undercutting mothers' ability to socialize competent emotion regulation.

Observing Mothers' and Children's Emotion Regulation Behaviors: The problem of low base rate

Individuals are often criticized as very poor reporters of their own behaviors, in part because characteristics of their personality may interfere with their abilities to report on their own behaviors (e.g., Bank, Dishion, Skinner & Patterson, 1990). Structured interactional activities, although somewhat artificial, may capture actual behavioral responses during specific situations. One problem with using observer ratings, which also occurred in the present study, is the low base rate of behaviors. That is, behaviors are discrete and rare events; a specific behavior may not occur during a 5-minute interaction.

One way of overcoming the low base rate challenge is to use a number of varied and ecologically valid tasks in order to evoke a variety of behavioral responses. The present study is limited in that only one 5 minute activity was used to measure mothers' socialization of emotion regulation and children's use of specific regulatory behaviors.

An examination of the frequency of particular types of behaviors used by children and mothers during the waiting task revealed considerable variability in the rates of observed emotion-intensifying and attention-shifting behaviors. Quite surprisingly, children tended to wait for a considerable portion of the 5 minutes (on average 3-4 minutes) before experiencing difficulty with the task. Consequently, the tension between the demands of the task and children's abilities may not have been adequately stressed in the present study. More regulatory behaviors may emerge as children become increasingly stressed, frustrated, or bored. Moreover, if children are not becoming distressed, mothers may not need to socialize regulation.

Mothers were observed to use verbal distraction considerably more frequently than emotion-intensifying behaviors. Quite possibly, emotion-intensifying socializing practices occur after attention shifting strategies have failed. That is, mothers may try less intrusive strategies first and only if those strategies fail may resort to more extreme and emotionally reactive behaviors. Given the low level of frustration produced by this task, mothers who were observed to use emotion-intensifying strategies more frequently also may be quicker to react with anger during situations in which children experience distress. Increasing the length of the waiting task from 5 minutes to 7 minutes may make the task more challenging for both children and their mothers and produce more

variability in the frequency of mothers' and children's attention-shifting and emotion-intensifying behaviors.

Additionally, variations in the base rates of observed behaviors suggest that the waiting task was not well suited for observing variations in children's physical movements like proximity seeking or avoidance behaviors. The task was structured such that children were confined to a restricted area with mothers nearby. Determining whether children were avoiding a task directive (waiting in the area) or seeking an alternative activity was difficult. Children's proximity seeking was coded as children's physical approach towards mothers, but children were already in the vicinity of their mothers. In contrast, the waiting task captured verbal distraction behaviors quite effectively. During situations in which mothers must focus their attention on an activity other than their children and children have nothing to do, conversations may be a primary mechanism by which mothers assist children with regulatory efforts.

Limitations, Strengths and Future Directions

Although the present study addresses a critical area of research by focusing on the process by which mothers behaviors affect children's efforts to learn autonomous emotion regulation, the study is not without limitations. First, as just described, the waiting task may be better suited for eliciting variations in attention shifting strategies than emotional intensifying strategies. Second, shared method variance may explain the associations between mothers' socialization of emotion regulation and children's use of emotion regulation. That is, the same observer rated both mothers' and children's behavior, increasing the likelihood that concordance between mothers and children's behavior is partially explained by biases in observers' perspectives. Third, children develop rapidly

during toddlerhood, and findings generated from 2-year-old children may not generalize to samples of 3- and 4-year-old children, even for studies that have similar methods and participant demographics.

Fourth, all data were collected contemporaneously; and correlational data do not allow a causal test of the relations among the variables in the model. As such, other explanations for the relationships among mothers' socialization, children's reactivity and children's regulation are possible. Mothers' use of one specific strategy was generally not related to children's use of different but related strategies, rather on average mothers and children engaged in matching strategies. This finding may speak more strongly for modeling processes rather than for the proposed process by which mothers use of one category of strategies would relate to children's use of other strategies within that category. Further, rather than mothers' specific types of responses, mothers' general level of responding to children's emotional displays may be a critical aspect of the emotion-socialization process which maintains or strengthens children's emotional responses (Chaplin, Cole, Zahn-Waxler, 2005; Cole, Martin, Dennis, 2004). Thus, because data were correlational, each of these alternative hypotheses about how children acquire competent emotion regulation are reasonable explanations for the present findings.

Finally, although children's emotion regulation was the focus of study, children's regulatory behaviors were not observed in response to their actual distress. One problem with studying emotion regulation and children's emotional reactivity is that less reactive children appear to be well regulated. Thus, the effectiveness of strategies for reducing distress was not examined. Additional research is needed to more clearly elucidate the

relationship between children's reactivity, regulation, and the effectiveness of regulation for reducing children's reactivity.

Despite these limitations, the present study builds upon existing research and theory in a number of important ways and has a number of strengths. First, the current sample consisted of very low income, ethnic minority families, whereas much of the previous research on mothers' socialization of emotion regulation and children's emotion regulation has used mid- to upper-class, primarily Caucasian families. Including high-risk, low-income, and ethnic and cultural minority families in studies of basic developmental processes is critical because socialization practices and regulatory strategies may not be uniform across such diverse backgrounds (e.g., Devore & Schlesinger, 1987; McAdoo, 1993). Variations in the base rates of observed behavior may reflect cultural differences inasmuch as they may reflect variations in the effectiveness of the task.

Second, mothers' and children's behaviors were rated using objective, microsocial codes rather than the interval or global codes frequently used in other studies. Interval coding may underestimate the actual frequency of a behavior, while global coding often combines the intensity of a behavior with the frequency of its occurrence. One advantage of using the actual frequency of behavior is that the true variation of behavior can be observed. For instance, substantially greater individual differences in mothers' and children's use of attention-shifting regulation than emotion-intensifying behavior occurred.

The results of this study also suggest a number of areas for future research. Studies using a larger sample, multiple assessments, and multiple reporters are clearly

needed to understand the process by which mothers' behaviors and children's propensity towards emotional reactivity affects their emerging regulatory capacities. While mothers' reactions to children's emotions have been widely studied among Caucasian and middle- to upper-class families, the degree to which social interactional processes are similar across ethnically and economically diverse samples remains less understood (Custrini & Feldman, 1989; Denham, McKinley, Couchoud, & Holt, 1990; Fabes et al., 2001; Smith & Walden, 1999). Further, some mother and child regulatory strategies (e.g., cognitive restructuring) found in studies of middle to upper class families did not occur in this sample; this difference may have important implications for mothers' ability to prepare children for independent emotion regulation. Indeed, the large number of null findings, particularly with respect to the main effects of specific mother strategies and children's reactivity, leave open questions about how socialization and reactivity contribute to children's emerging emotion regulation abilities in minority and economically disadvantaged families.

Low income and minority families are understudied in terms of the associations among children's emotional reactivity, mothers' socialization efforts, and children's emotion regulation (Smith & Walden, 1999). Such a research gap is alarming since low-income, minority children are often identified to be at higher risk for developmental disorders. Overall, mothers and children generally matched one another in their use of distraction and aggressive regulatory strategies. Highly reactive children were unlikely to use adaptive, distraction-based regulation even when mothers provided distraction opportunities. Understanding how children's reactivity interferes with mothers' socialization of adaptive regulatory skills has important implications for interventions and

basic research on the process of emotion socialization. By studying families of different racial, ethnic, and economic backgrounds, future research has the potential to illuminate meaningful differences in the process and associated outcomes of emotion socialization across diverse samples of families.

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Appendix

1. Abbreviated Emotion Regulation Coding System code book.

Coping codes

1) Venting / Aggression is any verbal or physical expression of frustration or anger.

Ex.: Throwing, kicking, hitting, grabbing at objects, angry screaming/crying.

2) Avoidance is defined as focal making self physically unavailable or physically removing self from the task-area.

Ex.: Child runs, walks, crawls, scoots, or rolls away from the activity area.

3) Other Distraction is any self-focused or object-focused behavior that refocuses the child's attention away from the task. Other distraction also includes undirected vocalizations that shift child's attention away from the task.

Ex.: humming or singing, retrieving/playing with an object.

4) Verbal Distraction involves statements to mother that attempt to engage her in conversation.

Ex.: "mommy," "where is my blanket (or other object)?"

5) Proximity Seeking is child's movement toward mother that is intended to decrease distance between mother and child.

Ex.: Climbing onto mother's lap, reaching to mother, patting mother.

Maternal Assistance Codes

6) Destructive Coping involves mother's verbal derogation or threatening of child.

Ex.: "You're not being good," "I'm gonna get you," "You're not getting a toy/candy"

7) Harsh Physical involves mother's physical punishment or attack of child.

Ex.: Slapping, hitting, pinching child with the intent or result of inflicting pain.

8) Verbal Distraction involves statements to child that attempt to engage child in conversation.

Ex.: "What are you doing?" "Where is (names family member)?"

9) Physical Soothing gestures are contact-oriented or proximity-oriented attempts to reduce the child's negative arousal.

Ex.: Inviting child to move closer, moving closer to the child, hugging or patting the child.

2. Human Subjects Approval Form.

University Committee for the Protection
of Human Subjects in Research
University of New Orleans

Form Number: 7AUG04
(please refer to this number in all future correspondence concerning this protocol)
Principal Investigator: Laura Scaramella Title: Associate Professor
Faculty Supervisor: _____ *(if PI is a student)*
Department: Psychology College: Science
Project Title: The mothers and preschoolers study: Wave 2
Date Reviewed: 8/02/04

Dates of Proposed Project Period From 8/15/04 to 8/14/05


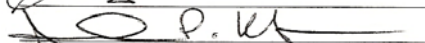


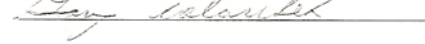


**approval is for one year from approval date only and may be renewed yearly.*

Note: Consent forms and related materials are to be kept by the PI for a period of three years following the completion of the study.

- | Approval Status | Date |
|---|------|
| <input checked="" type="checkbox"/> Full Committee Approval | |
| <input type="checkbox"/> Expedited Approval | |
| <input type="checkbox"/> Continuation | |
| <input type="checkbox"/> Rejected | |
| <input type="checkbox"/> The protocol will be approved following receipt of satisfactory response(s) to the following question(s) within 15 days: | |

add mandated reporter right to remove data

Committee Signatures:

	Laura Scaramella, Ph.D. (Chair)
	Pamela Jenkins, Ph.D.
	Anthony Kontos, Ph.D.
	Betty Lo, M.D.
	Richard B. Speaker, Ph.D.
	Gary Talarchek, Ph.D.
	L. Allen Witt, Ph.D.

Vita

Scott Mirabile was born in New Orleans, Louisiana and graduated Summa Cum Laude from Clemson University in South Carolina in May of 2003 with a B.A. in Psychology. In his fourth year he served as an editor for Clemson's undergraduate online research journal (CUJO). As a research assistant to Dr. Laura Scaramella, Scott is currently studying the socialization of emotion regulation and how parent- and child-factors influence the socialization process.