MATERNAL REGULATION STRATEGIES AND TODDLERS’ FRUSTRATION: RELATIONS TO CHILD GENDER

Whitney G. Hendricks

A Thesis Submitted to the University of North Carolina Wilmington in Partial Fulfillment of the Requirements for the Degree of Master of Arts

Department of Psychology
University of North Carolina Wilmington
2008

Approved by

Advisory Committee

Simone Nguyen  William Overman
Carol A. Pilgrim  Anne Hungerford
Chair

Accepted by

Dean, Graduate School
Maternal Regulation Strategies and Toddlers' Frustration:

Relations to Child Gender

Whitney Hendricks

University of North Carolina Wilmington
TABLE OF CONTENTS

ABSTRACT .................................................................................................................................................. v

ACKNOWLEDGEMENTS .......................................................................................................................... vi

LIST OF TABLES ....................................................................................................................................... vii

INTRODUCTION ......................................................................................................................................... 1

What is Emotion? ...................................................................................................................................... 2

What is Emotion Regulation? ................................................................................................................... 2

Normative Development of Emotion Regulation ....................................................................................... 4

Individual Differences in Emotion Regulation .......................................................................................... 6

Gender Differences in Emotion Regulation ............................................................................................... 7

Biological Perspectives on Gender Differences ......................................................................................... 9

Environmental Perspectives on Gender Differences ................................................................................ 10

Approaches to Measuring Maternal Behavior ......................................................................................... 12

Rationale for Current Study ..................................................................................................................... 18

Hypotheses ............................................................................................................................................... 19

METHOD .................................................................................................................................................. 20

Participants ............................................................................................................................................... 20

Materials and Procedure .......................................................................................................................... 21

Data Coding ............................................................................................................................................. 23

Child Affect ............................................................................................................................................. 23

Child Strategies ...................................................................................................................................... 24

Maternal Strategies .................................................................................................................................. 25

Child and Maternal Strategies .................................................................................................................. 26
ABSTRACT

The current study investigated relations between maternal behavior and child gender in an emotionally challenging task under two conditions of maternal involvement. Relations between child distress and maternal and child strategies were examined in 67 mothers and their toddlers (22- to 26-month-olds). Toddlers were more distressed in the mother-uninvolved condition than in the mother-involved condition. Children’s use of distraction and object orientation were related to less distress in the mother-uninvolved condition and maternal use of distraction was related to less child distress in the mother-involved condition. Maternal use of soothing/comforting was positively related to child distress in the mother-involved condition. There were no effects of child gender on maternal behavior. Results suggest that the caregiver may play a meaningful role in regulating toddlers’ distress at this age and also support the hypothesis that distraction may be an adaptive strategy for regulating negative emotions. Possible explanations for the absence of findings related to child gender are discussed.
ACKNOWLEDGEMENTS

I would like to thank my outstanding mentor, Dr. Anne Hungerford, and my committee members: Dr. William Overman, Dr. Simone Nguyen, and Dr. Carol Pilgrim. Also, I’d like to extend a special thanks to my fellow colleagues in the Emotional Development Lab for their help with this research: Marianne Idol, Carrie Smith, Kalli Alexoudis, Jessica Haas, and Kate McCalla.
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Descriptive Statistics for Proportions of Intervals: Child Strategies,</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Child Distress and Maternal Strategies by Condition</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Child Strategies Across Mother-Uninvolved and Mother-Involved Conditions</td>
<td>50</td>
</tr>
<tr>
<td>3.</td>
<td>Partial Correlations for Child Distress and Maternal Strategies</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>(Mother-Involved Condition)</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Partial Correlations for Child Strategies and Maternal Strategies</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>(Mother-Involved)</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Summary of Hierarchical Regression Analysis for Child Distress,</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>Child Strategies and Child Gender Predicting Maternal Distraction</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Summary of Hierarchical Regression Analysis for Child Distress,</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>Child Strategies and Child Gender Predicting Maternal Soothing/Comforting</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Summary of Hierarchical Regression Analysis for Gender and Child Strategy,</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Interacting with Mother Predicting Maternal Distraction</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Summary of Hierarchical Regression Analysis for Gender and Child Strategy,</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>Object Orientation Predicting Maternal Observation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Distraction Predicting Maternal Observation</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Summary of Hierarchical Regression Analysis for Gender and Child Strategy,</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td>Interacting with Mother Predicting Maternal Observation</td>
<td></td>
</tr>
</tbody>
</table>
INTRODUCTION

Although research on the topic of emotion regulation has greatly increased in recent years, there is not universal agreement on the definition of this construct. However, one conceptualization that is similar to many others in the literature defines emotion regulation as “... those behaviors, skills, and strategies, whether conscious or unconscious, automatic or effortful, that serve to modulate, inhibit, and enhance emotional experiences and expressions” (Calkins & Hill, 2007, p. 229). A major developmental task in early childhood involves acquiring the abilities to cope with negative emotional experiences, including those involving anger or fear. Researchers are particularly interested in the origins of individual differences in emotion regulation because they predict aspects of children's later adjustment, including their social competence. Both biological and environmental factors are thought to shape individual differences in early emotion regulation.

One factor that may be relevant in understanding emotion regulation is child gender. Although there is relatively little empirical evidence to support the notion that boys and girls differ significantly in terms of emotional expressions or behaviors (e.g., aggression) in the first few years of life, research has documented more robust gender differences after 4 years of age (Keenan & Shaw, 1997). There are undoubtedly multiple factors that account for these differences. However, one variable that has been relatively neglected is caregiver behavior and its possible relation to the development of gender differences in young children's emotion regulation. Thus, the major purpose of the present study was to examine how mothers' responses to children's emotional expressions and behavior during a frustration task may vary as a function of child gender. Relations between maternal behavior and children’s emotion regulation were also examined. In order to provide a framework for this study, the following sections review
issues surrounding the definition of emotion and emotion regulation, the normative development of emotion regulation, and origins of individual differences in emotion regulation with a focus on parental socialization.

What is Emotion?

Within the emotion regulation literature, there are multiple definitions of emotion regulation and this inconsistency is largely due to the lack of consensus on the definition of emotion. Therefore, it is first necessary to discuss the significance of emotion and its definition. Although there is wide variation in defining emotion, there is general agreement that emotions are derived from the evolutionary history of humans. Emotions reflect biologically prepared capabilities that allow us to appraise given situations and then quickly act to sustain favorable conditions; the latter is often referred to as "action readiness" (Cole, Martin, & Dennis, 2004). Thus, emotions have survival utility and are a part of our biological endowment as they give us the capability to assess the nature or significance of situations and function to shape how we respond to situations as a consequence. For example, an individual who is about to be hit by a car would experience the feeling of fear. It is this situation that would produce the emotional experience and it is the sensation of fear that would aid the individual in assessing the context (i.e., that the situation is dangerous) and responding appropriately (Cole et al., 2004). According to some theorists, it is the nature of a given situation which determines the valence of the emotion, while the degree of perceived significance determines the magnitude and urgency of the emotional response (Campos, Frankel, & Camras, 2004).

What Is Emotion Regulation?

As stated before, there is no universal definition of emotion regulation. Indeed, some theorists argue that emotion cannot be meaningfully separated from regulation (Campos et al., 2004).
2004). However, as noted above, one definition of emotion regulation that shares similarities with other definitions in the literature is “. . . those behaviors, skills, and strategies, whether conscious or unconscious, automatic or effortful, that serve to modulate, inhibit, and enhance emotional experiences and expressions” (Calkins & Hill, 2007, p. 229). Emotion regulation is generally conceptualized as influenced by two dimensions, reactivity and control (Calkins & Hill, 2007; Thompson & Meyer, 2007; Walden & Smith, 1997). Reactivity is related to the construct of temperament and refers broadly to biologically based individual differences in emotional experiences and expressions. An individual’s vulnerability to distress in particular contexts reflects their reactivity or arousability. Reactivity is theorized to be largely influenced by genetic endowment and is present early in life, if not at birth. The control dimension refers to control of reactivity. The ability to control one’s emotional expressions and experiences is hypothesized to originate largely from the individual’s experiences within the environment, including their experiences with caregivers.

A widely accepted view is that reactivity is part of the emotion regulation process in that it influences the development of specific emotion regulation (control) strategies. For example, an infant who is highly reactive when their goals are blocked (i.e., easily frustrated/angered) may find it more difficult to control their reactivity and will require more external support (e.g., a supportive caregiver) for the development of effective regulatory strategies (Calkins & Hill, 2007; Eisenberg, Cumberland, & Spinrad, 1998; Fox, 1989; Thompson & Meyer, 2007). Emotion regulation is thus conceptualized as a dynamic process that involves multiple sources of influence.

It is hypothesized that emotion regulation functions to accomplish one’s goals in a given context (Thompson & Meyer, 2007). From a theoretical perspective, as emotion regulatory
strategies develop they begin to serve an adaptive function for the individual operating in the social world. For example, a child who has learned to adaptively regulate the emotion of anger when accidentally struck by another child would react in a non-aggressive manner, perhaps by telling an adult or by telling the other child about how they feel. This child would be socially reinforced by others in the environment in their attempts to self-regulate or “control” their emotional arousal by not hitting back, whereas a child who has not learned to effectively regulate the angry emotion would most likely be punished (e.g., experience rejection from peers or be reprimanded by an adult).

Researchers have linked emotion regulation to socioemotional adjustment, including the quality of individuals’ interpersonal relationships, throughout development (Calkins, 1994; Calkins & Hill, 2007; Grolnick, McMenamy, & Kurowski, 2006; Kopp, 1989). Empirical research indicates that the failure to acquire successful emotion regulation strategies is related to later adjustment difficulties (Calkins, 1994). These difficulties may be characterized as either undercontrolled (e.g., aggressive behavior) or overcontrolled (e.g., inhibited/anxious behavior) and may lead to future difficulties in social competence or even pathological consequences (Calkins & Hill, 2007; Grolnick et al., 2006). This research adds value to attempts to examine the various factors involved in the development of early regulatory processes.

**Normative Development of Emotion Regulation**

An influential perspective on the normative development of emotion regulation is that of Kopp (1989), who theorizes that emotion regulation progresses through a typical series of stages and is influenced by different systems. In the first few months of life, infants begin to alter emotional states. When unpleasant states arise (i.e., hunger, fatigue, etc.), young infants will engage in reflexive patterns of behavior such as sucking or orienting behaviors such as head-
turning or hand-to-mouth movement (Kopp, 1989). As physiological systems continue to develop, the infant gains increased attentional and motoric skills that allow him/her the ability to modulate affective states (e.g., gaze aversion from overly arousing stimuli or reaching for desired objects). With this ongoing development, infants may become further responsive to the environment and social cues offered by caregivers that facilitate the regulation of emotion states. The ability to successfully integrate these behaviors into their behavioral repertoire is essential in order to transition to independent self-regulation (Calkins & Hill, 2007).

The role of the caregiver is essential to examine during the early periods of development because infants remain reliant on adults to fulfill all their basic needs. It is the caregiver who is there to feed, to burp, and to soothe when the infant is faced with distress. Thus, the caregiver functions as external support to teach or model effective regulatory behaviors or strategies to the child with the notion that the child will eventually be able to self-regulate their emotions independently (Calkins, 1994; Calkins & Hill, 2007; Kopp, 1989; Thompson & Meyer, 2007). For example, a toddler begins to cry because he or she can’t fix a broken toy. The caregiver, in response, might draw the child’s attention to another toy in order to alleviate the child’s distress. This type of caregiver behavior may seem subtle; however, it is this kind of subtle teaching that is likely to allow children to develop effective emotion regulation abilities.

In concert with continued social interaction other developmental systems emerge, such as language abilities. Language is a powerful tool that allows the child to begin to understand different emotions (Kopp, 1989). The child continues to learn effective regulatory behaviors through verbal interaction with the caregiver as well as others within their environment. At this period of development, direct training of regulatory skills is more robust. In other words, the
caregiver can explain to the child how to appropriately manage emotional arousal. These dyadic interactions aid in building the foundations for an emotion regulation repertoire.

**Individual Differences in Emotion Regulation**

The normative development of emotion regulation follows a fairly predictable path in infancy and early childhood (Kopp, 1989). However, important individual differences exist in the way infants learn to regulate their emotional states (Calkins, 1994). Due to the array of factors involved in this process, the study of individual differences becomes complex, yet vital to the prediction of socioemotional adjustment. Individual differences in emotion regulation are hypothesized to be influenced by “intrinsic” (e.g., temperament) as well as “extrinsic” factors (e.g., caregiver behavior). Although there is disagreement about the relative influence of different factors, there is general agreement that a combination or interaction of these variables indeed impacts the development of individual differences in emotion regulation (Calkins & Hill, 2007; Cole et al., 2004; Grolnick et al., 2006; Kopp, 1989; Thompson & Meyer, 2007; Walden & Smith, 1997).

Calkins (1994) proposed a model in which individual differences in emotion regulation result from bidirectional influences between internal child characteristics and external social forces. In this model, temperament (determined by neurobiological factors) results in a particular behavioral profile (e.g., highly reactive to blocked goals). As noted above, a child who is highly reactive when their goals are blocked (i.e., easily frustrated/angered) may be more reliant on the caregiver to teach or model effective regulatory strategies than a less reactive child. In Calkins’ model, caregivers’ behavior is hypothesized to affect the child’s regulatory strategies. Parents who respond to a highly reactive child by facilitating exploration when possible and avoiding unnecessary control are likely to foster more effective regulatory strategies and
ultimately more positive social adjustment. In contrast, parents who respond to an easily frustrated child by restricting the child’s activity and exerting high levels of control are likely to foster less effective regulatory strategies and poorer social adjustment. The concept of bidirectional influences allows for a dynamic view of the formation of individual differences in emotion regulation.

Although by no means the only socializing agents in children’s lives, parents are likely to influence how children respond to and cope with emotionally evocative situations. Studies have investigated a variety of caregiver factors including maternal sensitivity; emotional expressiveness; modeling emotion regulation strategies; emotional talk; and beliefs about emotion. Research has suggested that these caregiver characteristics and behaviors can impact the development of emotion regulation. However, as a result of the bidirectional relationship between caregiver and child, child characteristics also influence caregiver behavior. One child characteristic that may influence socialization practices that are relevant to individual differences in emotion regulation is child gender. Before reviewing the literature on this topic, an overview of gender differences in early emotion regulation is provided.

*Gender Differences in Emotion Regulation*

Research has documented gender differences in emotion regulation occurring during infancy through the preschool years and beyond. During the toddler years, there is some evidence that boys and girls use different strategies to regulate their negative arousal during a frustrating task. Raver (1996) found that when access to a desirable toy was denied, 24-month-old boys were more likely to use distraction (i.e., focusing on something other than the unattainable toy) while girls were more likely to seek comfort from mothers. Calkins (2002) found that at 24 months, boys were marginally more likely than girls to display "venting" (i.e.,
aggressive behavior such as hitting, throwing, banging, and kicking directed at a person or object) during a frustrating task. Differences in the strategies that children use to regulate their negative emotions are potentially important because research indicates that some strategies are more effective than others in decreasing distress. In general, behaviors which focus attention on the source of negative arousal are less effective in reducing distress than behaviors that focus attention away from the source of arousal (e.g., some form of distraction) (Grolnick et al., 2006). In addition, there is evidence that "venting" is positively related to child distress (Calkins, 2002).

Although some research does support the notion that there are gender differences in early emotion regulation, it is important to note that other research does not (e.g., Diener & Mangelsdorf, 1999; Spinrad, Stifter, Donelan-McCall, & Turner, 2004). Thus, research focused on gender differences in early emotion regulation remains relatively inconsistent. However, there is substantial research to suggest that gender differences in behaviors closely linked to emotion regulation become more pronounced as children get older. For example, research has shown that by 4 years, boys engage in more destructive and physically aggressive behaviors than girls (Keenan & Shaw, 1997). Based on this evidence, some researchers have hypothesized that girls may be socialized toward overcontrolling (internalizing) rather than undercontrolling (externalizing) behaviors (Calkins, 2002; Keenan & Shaw, 1997). For the minority of individuals who show clinically significant problems in adjustment, these different patterns of socialization have implications for diagnoses. For example, researchers have found that by early adolescence, girls are twice as likely as boys to exhibit depressive symptomatology. Boys are more likely than girls to receive a diagnosis of conduct disorder, characterized by aggressive behavior toward others and/or objects (Brody, 1999). In adult populations, more women than men are reported to suffer from anxiety disorders (as cited in Keenan & Shaw, 1997). Thus,
there is evidence to suggest that boys and girls are socialized toward different pathways of negative emotional expression, girls toward internalizing and boys toward externalizing behaviors. The present study focused on differential treatment of boys and girls by mothers and its potential implications for gender differences in young children’s emotion regulation.

Researchers agree that there are multiple influences underlying the development of gender differences, although different theoretical perspectives tend to emphasize certain influences over others (i.e., biological versus environmental). The following sections offer a very brief review of the biological perspective and a more extensive review of the environmental perspective and their relevance to understanding the development of gender differences.

**Biological Perspectives on Gender Differences**

Although there are many potential biological influences on gender development, many researchers have focused on hormones and their potential role in the development of gender differences in behavior. Animal research studies have demonstrated that hormones may affect behavior by producing permanent changes in brain structure early in development and they may also influence changes in the brain and behavior later in life (i.e., adolescence and adulthood) by temporarily altering neural circuitry (Ruble, Martin, & Berenbaum, 2006). Sensitive periods for permanent effects of hormones on brain and behavior also play major roles early in development, the most important being during gestation, directly after the genitals differentiate (Ruble, Martin, & Berenbaum, 2006).

With regard to human development, the influence of androgens has been examined early in development as a potential contributing factor toward sex- differentiated behavior (Pasterski, Geffner, Brain, Hindmarsh, Brook, & Hines, 2005). Hormonal theorists argue that levels of prenatal androgens could possibly contribute to various aspects of gender-differentiated
behavior, for example toy choice (Pasterski et al., 2005). Due to the unethical nature of purposefully manipulating prenatal hormone levels, human research has relied on naturally occurring experiments, including disorders that affect early exposure to androgens or other sex hormones. The most extensively studied genetic disorder in this category is congenital adrenal hyperplasia (CAH). This disorder is a result of an enzyme defect affecting cortisol production, causing the fetus to be exposed to high levels of androgens early in gestation (Ruble, Martin, & Berenbaum, 2006). Studies examining girls born with CAH have shown a general increase in masculine tendencies (i.e., reported feelings, preferences, and observed behavior) (see Ruble, Martin, & Berenbaum, 2006 for a review of these studies). Results of these studies provide some support for the hypothesis that that prenatal exposure to androgens may indeed impact sex-differentiated behavior.

Although it is clear that biological factors are likely to influence gender differences in behavior, it is also hypothesized that environmental factors, including parental socialization, are likely to influence these differences as well (Ruble, Martin, & Berenbaum, 2006). The following sections review the potential influence of socialization on the development of gender differences, the focus of the current study.

**Environmental Perspectives on Gender Differences**

Social cognitive theory is a prominent socialization theory of gender role development (Bussey & Bandura, 1999). The theory identifies multiple levels of environmental influence on the development of gender roles in young children. Bussey and Bandura (1999) emphasize that “[...] gender conceptions and role behavior are the products of a broad network of social influences operating both familially and in the many societal systems encountered in everyday life” (p. 676). By observing the behavior of both sexes, children may learn “appropriate” roles
for both boys and girls within society by abstracting rules and styles of modeled behavior (Ruble, Martin, & Berenbaum, 2006). For example, boys may learn that men are the “bread winners” of the household and girls begin to understand that females play a more domestic role within the family.

As these gender-stereotyped concepts begin to emerge, direct reinforcement during day-to-day exchanges with caregivers is also evident and is often gender-typed (Leaper, 2002). For example, a little boy who has just fallen and hurt his knee while running might receive a caregiver response such as, “Let’s be a big boy and not cry” as opposed to a girl who might hear, “It’s alright, Mommy will make it better.” Daily experiences with caregivers in addition to early learning of gender roles may influence the way boys and girls learn to regulate their emotions.

Empirical research, however, has offered mixed evidence to support the notion that caregivers treat boys and girls differently during early childhood. Lytton and Romney (1991) completed a meta-analysis of 172 studies examining parental differences in the treatment of boys and girls. Their results indicated only small and non-significant effects for differences in parental behavior with the exception of the finding that parents encourage gender-typed play. However, researchers in this area have criticized the meta-analysis for “lumping” studies into broad categories (e.g., amount of interaction; encouragement of dependency; warmth, nurturance, and responsiveness). Thus, some researchers have argued that the categories washed out potentially significant findings (Fivush, 1998). Although Lytton and Romney (1991) reported non-significant findings for the most part, there were several trends in the expected direction. For example, they found that parents showed more prohibition of aggression for girls and displayed less warmth toward boys. These trends, although non-significant, may suggest subtle differences in parental behavior, differences that may not be captured when compiled into broader categories
(Fivush, 1998). Thus, it may be hypothesized that it is the subtle nuances of daily interaction with the caregiver that may aid in shaping gender differences in children’s behavior. These caregiver behaviors may greatly influence how children learn to regulate their own emotions and in turn the development of social relationships (Eisenberg et al., 1998; Leaper, 2002). A close examination of caregiver responsiveness as a function of child gender is warranted in order to understand the possible underlying mechanisms that account for gender differences in emotion regulation.

Approaches to Measuring Parental Behavior

Research has utilized both self-report and observational measures in examining associations between child gender and parental behavior relevant to the socialization of emotion regulation. Researchers using parental self-report in studies of older children have offered some evidence to suggest that parents react to their sons’ and daughters’ emotional displays differently. In a study by Block (1979), findings indicated that mothers and fathers encouraged their sons to control their emotions more than daughters (as cited in Eisenberg et al., 1998). Another study by Casey and Fuller (1994) had similar results, finding that parents were more likely to instruct boys not to show fear. However, other studies using parent self-report measures have not tended to support the notion that parents react differently to their boys’ and girls’ emotional displays (Eisenberg & Fabes, 1994; Eisenberg, Fabes, & Murphy, 1996).

As noted above, it has been hypothesized that it is the subtle nuances of daily interaction with the caregiver that may aid in shaping gender differences in children’s behavior. Subtle reinforcement a child may receive for gender-appropriate emotion regulation is difficult to identify, especially with self-report measures, since caregivers may be unaware of differences in their own behavior to boys and girls. Few observational studies examining parental behavior as
a function of child gender have been conducted in the research on emotion regulation. Indeed, the majority of the published literature has relied on self-report measures. However, there is some evidence that caregivers provide subtle reinforcement to gender-specific emotional displays by indirectly communicating that certain emotions or regulatory strategies are more appropriate or acceptable for boys or girls (Chaplin, Cole, & Zahn-Waxler, 2005).

The following section reviews four observational studies that have examined parental responses to boys’ and girls’ emotional expressions. To our knowledge, no studies have directly examined differential parental responses to the strategies that boys and girls use to regulate emotions. The studies vary in their methodologies, including the measurement of maternal and child behavior, as well as in the ages of their samples. These differences make comparisons across studies somewhat difficult and the findings across studies are not entirely consistent. However, in general these studies provide support for the hypothesis that differential parental behavior to boys and girls, although potentially subtle, may be one influence on gender differences in emotion regulation.

Chaplin et al. (2005) examined gender differences in children’s submissive and disharmonious emotions and parental attention to these emotions. Participants were assessed at age 4.5 years and again during first 6 months of 1st grade. Parent-child dyads were observed playing a competitive stacking game in a laboratory setting. Experimenters coded non-verbal child emotional expressions and parental reactions to these emotions. Child facial expressions were coded as happy, angry, or sad-anxious and these codes were then collapsed into three categories: harmonious-happiness, disharmonious-emotions, and submissive emotions, respectively. Parental attention to children's emotional displays was operationally defined as any
verbal, behavioral, or emotional response that immediately followed children's emotional
expressions.

Girls showed more submissive expressions than boys at both ages, and boys were
marginally more likely than girls to show disharmonious expressions at early school age. With
respect to parental behavior, results indicated that fathers offered significantly more attention to
girls’ submissive expressions than to boys’ expressions of sadness and anxiety at 4.5 years; there
was also a trend in the same direction at the early school age assessment. In addition, fathers
were more attentive to disharmonious expressions in boys than in girls at the early school age
assessment. Mothers' attention to children's emotional displays did not vary by child gender.
Finally, parental attention to submissive expressions at 4.5 years predicted higher levels of these
expressions at early school age when stability of submissive expressions was controlled,
although this was not the case for disharmonious expressions.

The findings of this study suggest that boys’ and girls' emotional displays (particularly of
sadness/anxiety versus anger) may differ in frequency and that fathers, but not mothers, respond
differentially to these displays in boys and girls. These results are consistent with previous
research on fathers indicating that fathers respond differentially to boys and girls more often than
do mothers (Lytton & Romney, 1991). The finding that parental attention to children's
submissive emotions at 4.5 years was positively related to submissive emotions at early school
age suggests that parental responses may shape children's regulatory strategies; to the extent that
parents fail to attend to certain expressions, children may develop strategies to minimize these
expressions. However, because the measure of parental attention included any response (positive
or negative) to children’s emotional expressions, the quality of parental responses to boys’ and
girls’ emotional displays cannot be determined from these data. Presumably, it is not only
whether parents attend differentially to children’s emotional displays but also the nature of their responses that is likely to influence children’s behavior.

In an unpublished observational study by Kochanska (1987), maternal behavior was examined to determine how mothers handle their toddlers’ anger (as cited in Radke-Yarrow & Kochanska, 1990). Mothers and their toddlers (2.5 – 3 years) were assessed naturalistically by observing them during their daily routines. Researchers coded mothers’ naturally occurring responses to child anger and found that mothers showed more attentive concern to boys’ anger than to girls’ anger. In addition, mothers “gave in” to gratification desired by boys more often than to girls’ desires, and were more likely to ignore or inhibit girls’ anger.

Calkins (2002) examined relations between maternal behavior and children’s “aversive” behavior, including distress during frustration tasks and “venting” (aggressive behavior in response to frustration) in a short-term longitudinal study beginning when children were 18 months of age. Unlike the studies by Chaplin et al. (2005) and Kochanska (1987), maternal behavior was assessed in relatively non-stressful contexts and related to children's behavior during separate tasks designed to elicit frustration. Maternal behavior was coded during three play interactions at each age and summary scores of maternal negative control and positive guidance were created. Negative control was based on the frequency of negative verbal statements (e.g., scolding, threats, criticism), physical control (e.g., restraining child’s movement, pushing/pulling, hand slapping), and verbal control (e.g., commands). Positive guidance was based on the frequency of positive verbal statements (e.g., praise, affection), maternal demonstration of behaviors for the child, and verbal statements indicating guidance/support (e.g., positive feedback, suggestions).
Findings indicated that mothers behaved differently with boys than with girls. Specifically, mothers showed less positive guidance to boys at 18 months of age and more negative control at 24 months of age than did mothers of girls. In addition, negative control at 18 months was more strongly related to negative control at 24 months for mothers of boys relative to mothers of girls. Although one possible interpretation of these findings is that boys engaged in higher levels of “aversive” behavior than did girls, the only gender difference in child behavior was that boys engaged in marginally more venting than girls at 24 months. Calkins (2002) suggests that these early differences in maternal behavior with toddler-age boys and girls may be one factor that could influence eventual gender differences in emotion regulation and adjustment.

It is important to note that relations between maternal and child behavior also varied by child gender. Specifically, negative control was positively correlated with boys’ distress to frustration at 24 months but negatively correlated with girls’ distress. Thus, although mothers treated boys and girls differently despite only minor differences in children’s behavior, these findings also suggest that boys may be more vulnerable to mothers’ negative behavior than are girls (Calkins, 2002). In addition, these findings differ from those of Kochanska (1987) in that they suggest that mothers respond more negatively to boys’ displays of anger/frustration.

Maternal strategies for regulating children’s negative emotions differed as a function of child gender in a study by Grolnick, Kurowski, McMenamy, Rivkin, and Bridges (1998). Participants included mothers and their toddlers (12-, 18-, 24-, and 32-month olds) assessed in a laboratory setting. The researchers sought to identify and code strategies that mothers used to regulate their children’s distress and to investigate possible influential variables such as children’s age and gender. The assessment included an initial free play activity followed by two
frustration tasks in which the child was denied access to a desirable toy or edible. In addition, there was an “active” condition in which the mother could respond as she normally would to the child (without providing access to the toy or snack) and a “passive” condition during which the mother was instructed not to initiate interaction with the child. The order of the two frustration tasks and of the maternal behavior conditions were counterbalanced across subjects, resulting in four conditions. Researchers identified six maternal strategies, coded in 5-second intervals, including active game-like engagement (i.e., mother actively plays with child); redirection of attention (i.e., mother actively attempts to distract or redirect the child from the desired object); reassurance (i.e., mother reassures the child that he/she will soon receive the desired object); following (i.e., mother makes comments about the child’s distress); focus on the desired object (i.e., mother draws attention to the object of frustration without instigation by the child) and physical comfort (i.e., behaviors such as hugging, kissing, or picking up the child). Other codes included “passive”, indicating the mother did not interact or remained passive with the child for the full interval and “other behavior”, including behavior other than one of the six regulatory strategies (e.g., comments not related to the task, attending to other objects in the room). In general, controlling for children's age and level of distress in the parent-active condition, mothers who engaged in more passive behavior or in higher levels of "other behavior" during the parent-active condition had children who showed less distress in the parent-passive condition.

Mothers of 12- and 18- month-old boys were more passive than mothers of girls at these ages, although gender differences in distress level during the parent-passive condition were not reported. Based on the pattern of findings, Grolnick et al. suggest that mothers may be socializing boys toward independent (and more effective) emotion regulation and girls toward greater reliance on others for regulation by allowing boys to "practice" independent regulation.
Rationale for Current Study

In general, these four studies support the view that parental responses to specific emotional displays, as well as differential modeling of regulatory strategies for boys and girls, may play a role in influencing gender differences in emotion regulation. However, relatively few studies have examined these possibilities despite the fact that many researchers have argued that boys and girls are led toward divergent pathways in the development of emotion regulatory styles as a result of their experiences within their social environment.

Moreover, the existing data are not entirely consistent. As noted above, although these studies present some evidence that parents respond differently to boys’ and girls’ emotional displays, particularly anger/frustration, the nature of the findings seems to vary across studies. Kochanska (1987) found that mothers are more attentive to and respond more positively to boys’ anger than to girls’ anger, Grolnick et al. (1998) found that mothers are less likely to intervene with boys than with girls in a frustrating context, and Calkins’ (2002) findings suggest that mothers respond more negatively to boys’ distress and aggressive behavior. Thus, there is a need for additional research in this area. With respect to methodology, the current study resembled that of Grolnick et al. but sought to clarify and extend the findings. Specifically, Grolnick et al. found that mothers who were more passive or engaged in “non-strategy behavior” with their children during a frustrating task had children who showed less distress during a separate frustrating task. Moreover, mothers of boys were more passive than mothers of girls, leading the authors to speculate that mothers may socialize boys toward more effective regulation. However, other research indicates that by age 4 boys are more likely than girls to show aggressive, destructive behaviors and other externalizing behaviors, suggesting they have greater difficulty regulating anger/frustration than do girls. In addition, it is not entirely clear why passive
maternal behavior should be related to lower levels of child distress. Although the authors argue that such passive behavior may allow children the opportunity to “practice” independent regulation, modeling or teaching regulatory strategies to children also seems important. For these reasons, it was especially important to replicate Grolnick et al.’s findings.

Finally, although other studies have examined how mothers may respond differently to boys' and girls' similar emotional displays, these studies have not typically examined whether mothers may respond differently to the same child regulatory strategy if it is used by a boy or by a girl. Such differential responding could influence gender differences in children's regulatory strategies, and there are some data indicating gender differences in young children's regulatory strategies (Calkins, 2002; Raver, 1996). The present study examined whether child strategies used by boys or girls related differentially to maternal strategies.

Hypotheses
1. Based on previous research, it was hypothesized that children's distress would be related to both maternal and child strategies. Specifically, it was hypothesized that maternal or child strategies that encourage focus on the source of frustration would be related to greater child distress, while the strategy of distraction used by mother or child would be related to less child distress. In addition, it was hypothesized that the strategy of venting would be related to greater child distress.

2. Gender differences in child distress and child strategies were examined. Based on previous literature, it was hypothesized that boys and girls would not differ in level of distress. Few studies have examined gender differences in children's strategy use. However, based on Raver (1996), it was hypothesized that boys would engage in more distraction. In addition, it was hypothesized that boys would engage in more venting than girls (Calkins, 2002).
3. It was hypothesized that maternal behavior (i.e., choice of strategies) would differ as a function of child gender. We examined maternal strategies in relation both to child distress and in relation to child strategies. Previous studies on this topic have been inconsistent and therefore specific predictions were difficult. However, the following questions were examined:

a. Are mothers more likely to make active attempts to regulate boys' or girls' distress? That is, are mothers less passive with boys or girls?

b. Are mothers more likely to engage in specific strategies with girls or boys? Based on Raver's (1996) findings of gender differences in children's strategy use, it is possible that mothers may model distraction more often for boys. Beyond this prediction, the analyses were exploratory in nature.

4. Do mothers respond differently to the same child strategy when it is used by boys or by girls? Although the nature of the data does not permit inferences about the direction of effects, we examined whether associations between specific child strategies and specific maternal strategies were moderated by child sex.

METHOD

Participants

Seventy-one 22- to 26-month-old children and their mothers were recruited for the current study, which is part of a larger longitudinal study on emotional development. Data from a total of 67 dyads (40 boys and 27 girls) were used for analyses in this study (please see explanation below). The average age of mothers was 32.7 years ($SD = 4.07$). The educational level of mothers was relatively high, with 62.7% of mothers holding a bachelor’s degree or higher, 20.9% having some post-high school education, 9.0% holding a high school diploma or GED, and 1.5% having less than a high school diploma. Ninety-one percent of children lived
in two-parent households and 4.5% lived in single-parent homes. With respect to child ethnicity, 82.1% of children were European-American, 4.5% were African-American, 4.5% were Hispanic, 1.5% were Native American, and 1.5% were biracial. These numbers do not add to 100% because four participants were missing demographic data.

Participants were recruited through public birth records and childcare centers in a small southeastern city in the United States. Letters were sent to parents explaining the nature of the study and informing them that they would be contacted by phone to inquire about their interest in participation. Mothers were called approximately two weeks later by research assistants who gave further details regarding the procedures, answered any questions, and scheduled them for a laboratory assessment if they agreed to participate. Mothers received $20.00 for their participation in the study.

Materials and Procedure

The assessments took place in a laboratory furnished with an adult-sized chair, a stack of magazines, a small table and chair for the child, and a larger table that was used to keep certain items out of the child’s reach. A one-way mirror built into one of the walls of the lab allowed filming of the assessment.

The task designed to elicit frustration was adapted from Diener and Mangelsdorf (1999) and occurred during a longer 2 hr lab assessment. Materials included a small, clear Tupperware container with a lid and approximately 0.5 oz (15 g) of goldfish crackers. The clear Tupperware container allowed the child to see the crackers inside, but the lid could not be opened by small children, making access to the crackers impossible. During the scheduling call, mothers were asked if their children liked goldfish crackers. If not, another edible substitute the child liked was provided.
Written instructions were given to the mother before the task began. The instructions asked the mother to sit in the chair and read magazines and not to initiate interaction with her child. If children initiated interaction, mothers were instructed to respond as briefly as possible (e. g., “I’m busy”). The instructions explained to mothers that after a few minutes they would hear a knock indicating that they could interact with their children as they normally would. However, mothers were also instructed not to open the container for their children. Mothers were informed that they could stop the task at any point if they felt that their children were becoming too distressed.

After answering any questions the mother had, the experimenter left the room to retrieve the Tupperware container with the goldfish crackers. When she re-entered the room, the experimenter handed the container to the child and said, “There’s a treat in here. You can have it in a few minutes” and then exited the room. If the child would not come to the experimenter to take the container, it was placed on the floor. After 3 min the experimenter knocked on the mirror, signaling the mother to interact as she normally would. After 3 more min, the experimenter entered the room and opened the container for the child. If the child cried continuously and with high intensity for more than 15 s during the first 3 min of the task, the experimenter knocked on the mirror early to signal the mother to interact. If the child cried continuously and with high intensity for 15 s after the knock, the experimenter ended the task early by entering the room and opening the container for the child.

Due to several complications, data were available for 67 of 71 mother-child dyads. There was one incidence of technical malfunction resulting in a loss of data, one child who opened the container independently at the beginning of the task, and two children who were diagnosed with developmental delays after participating in the study at 24 months. There was also some missing
data for the 67 participants included in the study. Specifically, 5 mothers misunderstood the directions and opened the container for the child at the beginning of the mother-involved condition, making it impossible to code any maternal or child behaviors in that condition. Additionally, 1 child opened the container at the beginning of the mother-involved condition, rendering it uncodeable. Therefore, there were only data for 61 dyads in the mother-involved condition. Additionally, there were two children whose strategies were uncodeable in one condition because they were off-camera for most of the time; for one child, this occurred during the uninvolved condition and for the other child it occurred during the involved condition.

Data Coding

The frustration task was recorded to DVD. The task lasted for 6 min. The first 3 min of the task was labeled the “mother-uninvolved” condition; the experimenter’s knock signaled the beginning of the “mother-involved” condition, also 3 min. Coding for the mother-uninvolved condition began 2 min prior to the knock, while coding for the mother-involved condition occurred for 2 min after the knock. Child affect, child strategies, and maternal strategies were each coded by independent pairs of coders. Child affect and child strategies were coded during both conditions. Maternal strategies were coded only during the mother-involved condition. The coding systems for child affect, child strategies, and maternal strategies were adapted from previous coding systems.

Child affect. Child affect was assessed by calculating the duration (in s) of child whining, fussing, or crying. Because the child’s face was not always clearly visible, only vocalizations were included in this measure (see Appendix A for the coding manual for child affect). A pair of coders trained by watching pilot and participant data together; stopwatches were used to record the duration of negative vocalizations. Following training, reliability was assessed on a total of
13 pilot and actual participants coded independently (19% of the 67 participants coded). Pearson correlations were used to assess reliability between coders \( (r = .99, p < .001, \text{uninvolved condition}; \ r = .93, p < .001, \text{involved condition}). \)

*Child strategies.* Child strategy codes, adapted from Diener and Mangelsdorf (1999) and Calkins and Johnson (1998), included *interacting with mother, distraction, venting,* and *object orientation.* *Interacting with mother* described the child’s attempts to engage the mother in interaction, to gain mother’s attention, or to establish close proximity to mother (i.e., within arm’s reach). *Distraction* was coded when the child focused his/her attention on something other than the goldfish container and/or the child engaged in self-manipulative behaviors such as thumb sucking, twirling hair, or rocking. *Venting* referred to aggressive behavior such as banging, kicking, throwing or hitting directed at a person or object. *Object orientation* was coded when the child held, touched, or manipulated the goldfish container and/or when their visual attention was focused on the container. The coding manual for child strategies is provided in Appendix B.

Interrater reliability was established between a pair of coders using data from study participants. Following a training period during which coders jointly watched and coded children’s behavior using pilot and study participants’ data, 19.4% of participants’ data were coded independently by both coders to establish initial reliability. Reliability checks were continued on an on-going basis during data coding. The total number of participants coded for reliability was 18, which represented 26.9% of the total sample \( (N = 67) \). Reliability was calculated using percent agreement. Reliability estimates for each category ranged from 78% to 92.7% (interacting with mother = 92.7%; distraction = 78%; venting = 82.2%; object orientation = 79%).
Maternal strategies. Maternal strategies were adapted from Groenick et al. (1998) and Spinrad et al. (2004) and included: drawing the child’s attention to the object of frustration, distraction, soothing/comforting, bribery (future reward), observing child, and verbal command. Drawing the child’s attention to the object of frustration was coded when the mother verbally referenced the goldfish or pointed or gestured toward the goldfish or the container. (e.g., asking the child, “Do you want to eat the goldfish?”). Distraction occurred when the mother engaged the child in a discussion or activity unrelated to the inability to obtain the goldfish (e.g., looking at magazines). A code of soothing/comforting was given when the mother provided physical affection and/or pleasant, soothing vocalizations directed toward the child (e.g., mom holding the child on her lap and explaining that everything will be ok). Bribery-future reward was coded when the mother mentioned a future rewarding consequence (e.g., “You can have the goldfish in a few minutes.”). Observing child occurred when the mother did not respond verbally or behaviorally to the child but simply watched him/her. Verbal command was any verbal directive to regulate the child’s emotion or behavior (e.g., “Do not stand on the table”; “Come here”). The coding manual for maternal strategies is provided in Appendix C.

Before coding began, training sessions were conducted with two coders to establish interrater reliability. Pilot data and participant data were used in training sessions. During training, coders watched the frustration task together and scored maternal behavior. Following training, other participants’ data were coded independently to assess reliability. Interrater reliability was calculated using percent agreement and was initially obtained on 18% of the participants. Reliability checks were made throughout the coding process on a total of 20 participants, which corresponded to 33% of the total number of participants with data for maternal strategies (N =61). Reliability was calculated for each strategy and ranged from 56% to
87% (drawing the child’s attention to the object of frustration = 84%; distraction = 86%; soothing/comforting = 65%; bribery (future reward) = 73%; observing child = 74%; and verbal command = 56%). Although the reliability for verbal command was too low for publication purposes, we chose to retain this variable for the analyses reported here because reliability was higher (65%) until the final reliability check.

*Child and maternal strategies.* Child and maternal strategies were coded in 5 s intervals. Only one strategy was coded per interval. Thus, if the same strategy occurred multiple times within an interval, it was coded only once. In cases where different strategies occurred within the same interval, the first strategy was coded. The rationale for this rule was that the second strategy that occurred within an interval would typically continue into the next interval and be coded in that interval. Maternal and child strategy codes were operationally defined so that each code was mutually exclusive and no strategies could occur simultaneously. In addition, the strategy codes were exhaustive, meaning that a strategy was coded in every interval with the exception of an instance in which a child was distressed to such a level of intensity that visual attention could not be discerned. In this case, the interval was coded as *no strategy* for the child’s behavior (although in the mother-involved condition a maternal strategy was still coded). The *no strategy* code was only coded for a few participants (n = 5). Due to the low frequency of this behavior, the data for *no strategy* were not used in subsequent analyses.

**RESULTS**

*Preliminary Analyses*

For maternal and child strategy data, the frequency of each strategy (i.e., the number of intervals in which it was coded) was calculated. For the child strategy data, these frequencies
were calculated separately by condition. However, one or both conditions were curtailed for some dyads, usually due to child distress (and occasionally because either the child or the mother opened the container at some point during the task but not at the beginning of a condition). Thus, the frequency variables for maternal and child strategies were divided by the total number of coded intervals to yield proportion scores. The negative affect data were also transformed into proportion scores by dividing duration of distress by the total time coded in each condition (both in seconds). These proportion scores, rather than the raw frequency or duration data, were used in all analyses.

Descriptive statistics for the predictor variables (child strategies, child affect) and criterion variables (maternal strategies) are provided in Table 1. The first set of preliminary analyses examined whether children’s negative affect and their use of specific strategies differed across the mother-uninvolved and mother-involved conditions. Paired samples $t$-tests were conducted to determine if there were significant differences in distress or child strategies across conditions. Results indicated that children were significantly more distressed in the mother-uninvolved condition ($M = .29, SD = .30$) than in the mother-involved condition ($M = .18, SD = .21$), $t(60) = 3.69$, $p < .001$. For child strategies, there was a significant difference in children’s use of distraction across conditions. Children used distraction significantly more in the mother-uninvolved condition ($M = .14, SD = .21$) than in the mother-involved condition ($M = .06, SD = .10$), $t(59) = 3.28$, $p < .001$. No other significant differences were found across conditions for child strategy use (see Table 2).

In order to examine relations between child affect, child strategies, and maternal strategies, zero-order and partial Pearson correlations were calculated. Partial correlations were used for some of the analyses in order to control for variables that could influence the variables
of interest in a given set of correlations. The number of correlational analyses was large (N = 38). When a Bonferroni correction was applied with alpha set at .05, the resulting significance level was .001. Because these analyses were largely exploratory, we elected to present the results without the correction applied. However, the reader will note that many of the correlations reported and discussed below do not reach the adjusted level of significance. We first examined correlations between child distress and child strategies during the mother-uninvolved condition. A parallel set of correlations was calculated for child distress and child strategies during the mother-involved condition; maternal strategies were partialled because of their potential influence on child distress and/or child strategies. In addition, the relations between child distress during the mother-involved condition and maternal strategies during the mother-involved condition were examined using partial correlations that controlled for child strategies in the mother-involved condition. The relation between maternal and child strategies in the mother-involved condition was also examined using partial correlations that controlled for child distress.

Child distress and child strategies (mother-uninvolved condition). For this set of analyses, child distress during the mother-uninvolved condition was correlated with child strategies (interacting with mother, distraction, venting, and object orientation) during the mother-uninvolved condition using Pearson zero-order correlations. Three significant correlations were found between child distress and child strategies during the uninvolved condition. Specifically, child distress was positively correlated with interacting with mother ($r = .47, p < .001$), indicating that interacting with mothers was associated with greater child distress. Also, a negative correlation was found between child distress and children’s use of distraction ($r = -.36, p < .01$), indicating that greater distraction was associated with less child distress. Additionally, there was a negative relation ($r$
= -.47, p < .001) between distress and children’s use of object orientation, indicating that less distress was associated with more time focused on the object of frustration (i.e., the goldfish container). No significant correlation was found between child distress and the strategy of venting (r = .18, p = .15).

**Child distress and child strategies (mother-involved condition).** Partial correlations were used to examine the relations between child distress in the mother-involved condition and child strategies in the mother-involved condition, controlling for maternal strategies. One significant positive correlation was found between child distress and venting (r = .32, p < .05), indicating that greater distress was associated with higher levels of venting. No significant relations were found between child distress and the other child strategies: interacting with mother (r = -.08, p = .58); distraction (r = .02, p = .90); and object orientation (r = -.08, p = .59).

**Child distress and maternal strategies (mother-involved condition).** Partial correlations were used to examine relations between child distress and maternal strategies in the mother-involved condition, controlling for child strategies during this condition. Two significant relations emerged. A negative correlation was found between child distress and maternal use of distraction (r = -.30, p < .05), indicating that mothers’ use of distraction was associated with lower levels of child distress. Also, there was a positive correlation between child distress and mothers’ use of soothing and comforting (r = .39, p < .01), indicating that greater child distress was associated with mothers’ use of soothing and comforting. No other significant correlations were found between child distress and maternal strategies in the mother-involved condition (see Table 3).

**Child strategies and maternal strategies (mother-involved condition).** Partial correlations were used to examine the relationship between child and maternal strategies in the mother-involved
condition, controlling for child distress in this condition. Several significant relations emerged in this set of analyses. First, maternal use of distraction was positively correlated with children’s use of interacting with mother ($r = .27, p < .05$). This finding shows that children’s higher levels of interaction with mothers were associated with greater use of maternal distraction. Second, significant positive relations were found between maternal use of observation and two child strategies, distraction ($r = .45, p < .001$) and object orientation ($r = .45, p < .001$). These results indicate that mothers’ greater observation of their children was related to children’s higher use of distraction and focusing on the object of frustration. Finally, a significant negative correlation was found between maternal observation and interacting with mother ($r = -.70, p < .001$), indicating that mothers’ greater observation of their children was related to lower levels of children’s interacting with their mothers. No other significant associations were found between the remaining child and maternal strategies (see Table 4).

*Gender differences in children’s negative affect and strategy use.* The final set of preliminary analyses examined whether there were gender differences in children’s distress or their choice of strategies. These analyses were conducted because gender differences in children’s behavior could be one factor influencing differential treatment by mothers. Two multivariate analyses of variance (MANOVAS) were conducted, one for each condition, with child gender as the predictor variable and child distress and strategy variables as the criterion variables. The MANOVA predicting child distress and child strategies in the mother-uninvolved condition indicated a non-significant multivariate effect, Wilks’ Lambda $F(5, 60) = 1.16, p = .34$.

Inspection of the univariate analyses indicated no significant relations between child gender and children’s distress or strategy use in the mother-uninvolved condition. The second MANOVA predicting child distress and strategies in the mother-involved condition also indicated a non-
significant multivariate effect, Wilks’ Lambda, $F(5, 54) = .42, p = .84$. Univariate analyses indicated no significant associations between child gender and children’s distress or strategy use in the mother-involved condition.

**Predictive Analyses**

A major goal of the study was to examine whether maternal behavior toward children during a frustrating task differed as a function of child gender. To address this issue, hierarchical linear regressions were conducted to predict maternal strategies during the mother-involved condition using child gender as a predictor variable. Because mothers’ strategy use was related to children’s level of distress, we controlled for these variables. For each regression, a maternal strategy served as the criterion variable. On the first step of the model, child distress and the four child strategies in the mother-involved condition were entered. Child gender was dummy coded and entered on the second step of the model. A total of six regressions were conducted to predict each maternal strategy (i.e., drawing attention to the frustrating object, distraction, soothing/comforting, future reward, observation, and verbal command).

Child gender was not significantly related to any of the maternal strategies. However, there were relations between children’s distress and the maternal strategies of distraction and soothing and comforting that were consistent with the preliminary correlational analyses. Specifically, the overall model predicting maternal use of distraction was marginally significant, $F(6, 53) = 2.01, p = .08$. The partial t-tests on the regression coefficients indicated that maternal distraction was significantly related to children’s distress and inspection of the regression coefficient indicated that lower child distress predicted greater use of maternal distraction (see Table 5). In addition, the overall model predicting maternal use of soothing/comforting was significant, $F(6, 53) = 2.79, p < .05$. The partial t-tests on the regression coefficients indicated
that maternal soothing/comforting was significantly related to children’s distress, and inspection of the regression coefficient indicated that higher child distress predicted more soothing/comforting (see Table 6).

A second set of predictive analyses was conducted to explore possible interactions between child gender and children’s strategies in predicting maternal strategy use. Although the analyses reported above indicated that there were no main effects of child gender on maternal strategy use, it is still possible that child gender might interact with children’s strategy use to predict maternal behavior. That is, mothers may respond differently to the same child strategy depending on whether the strategy is used by a boy or a girl. In order to examine this possibility, a set of hierarchical regression analyses were conducted. In order to constrain the number of analyses, three maternal strategies were selected as criterion variables: drawing child’s attention to the object of frustration, distraction, and observation. These strategies were selected because of their prominence in past research on this topic. In each regression, child gender and a specific child strategy were entered simultaneously on the first step of the model. The interaction between child gender and the specific child strategy was entered on the second step of the model. Thus, four regression equations were conducted to predict each of the maternal strategies, one for each child strategy in the mother-involved condition (i.e., interacting with mother, distraction, venting, object orientation) and its interaction with child gender.

The analyses indicated no interactions between child gender and child strategies in predicting maternal strategy use. However, consistent with the preliminary correlational analyses, there were some significant associations between child and maternal strategies. Specifically, although the regression equation predicting maternal distraction from child gender and the child strategy of interacting with mother did not achieve significance, $F(3, 56) = 2.07, p$
= .12, the partial t-tests on the regression coefficients indicated that interacting with mother was significantly related to maternal distraction. Inspection of the regression coefficient indicated that higher levels of interacting with mother predicted greater use of maternal distraction (see Table 7). Similar findings emerged for three of the regression equations predicting maternal observation. Consistent with the preliminary correlational analyses, maternal observation was positively related to the child strategies of object orientation and distraction and negatively related to the child strategy of interacting with mother. Thus, greater use by children of object orientation and distraction predicted more maternal observation, while higher levels of interacting with mother predicted less maternal observation (see Tables 8, 9, and 10).

DISCUSSION

The aim of this study was to examine whether maternal behavior during an emotionally challenging or frustrating task varied as a function of child gender and to further explore relations between maternal behavior and children’s distress and regulatory strategies. Research has documented gender differences in children’s emotional expressions and other behaviors after 4 years of age (see Keenan & Shaw, 1997 for a review of these studies). However, current research has offered mixed evidence to support such gender differences during the toddler years. It is hypothesized that the emergence of gender differences in the later childhood years may be in part a function of differential treatment by caregivers that begins earlier in development.

The following sections review the findings of the current study in more detail and place these findings in the context of this study’s hypotheses and the larger literature. First, differences in children’s behavior across the uninvolved and involved conditions are discussed. Second, associations among child distress, child strategies, and maternal strategies are considered. The next section discusses the findings regarding gender differences in children’s
behavior. The final sections consider the results of the predictive analyses concerning child
gender and maternal behavior.

*Differences in Children’s Behavior Between Conditions*

Results from preliminary analyses examining differences in children’s distress and
strategy use across conditions indicated that mothers’ involvement was related to children’s
behavior. Specifically, children’s distress was significantly lower in the involved condition as
compared to the uninvolved condition. This finding is consistent with that of a study by Diener
and Mangelsdorf (1999). Past theory and research have suggested that maternal involvement is
central to the development of effective regulatory strategies (Calkins, 1994; Kopp, 1989; Spinrad
et al., 2004). Thus, data from this study are consistent with the hypothesis that the assistance of a
caregiver helps children to regulate negative affect. However, another possible reason why
children’s distress decreased in the mother-involved condition is because children were unable to
obtain attention from their mothers in the uninvolved condition. The frustration of being unable
to open the container compounded by their inability to interact with their mothers may have
exacerbated their distress. The resumption of normal interaction in the involved condition may
have reduced their distress despite the fact that children were still unable to obtain the goldfish
crackers.

The second finding from this set of analyses was that children tended to use more
distraction in the uninvolved condition than in the involved condition. One explanation for this
finding is that once mothers were signaled to act as they normally would, children chose to
engage with their mothers rather than independently distracting themselves; the latter strategy is
likely to be a more challenging one for toddlers. The data on strategy use are certainly consistent
with this interpretation, since the most common strategy by far in the mother-involved condition
was interacting with mother. Another interpretation is that some children using distraction in the uninvolved condition became bored after 3 min; thus, when mothers were available to interact, children tended to engage with them rather than to continue distracting independently. It is also important to note, however, that the coding system may have been inadequate to capture subtleties in children’s behavior. That is, it is possible that children were in fact using some forms of distraction in the mother-involved condition (e.g., talking to mom about things other than the goldfish, distracting independently within physical proximity of mother) that were actually coded as interacting with mother. Operational definitions of child strategy codes may have limited our ability to capture such subtle behavioral differences. Ideally, the child strategy codes would have allowed for such discriminations, but in order to establish acceptable levels of reliability certain distinctions had to be collapsed.

*Child Distress, Child Strategies, and Maternal Strategies*

We hypothesized, based on past research, that child or maternal strategies that involved redirecting attention away from the source of frustration would be related to lower child distress, while strategies that focused attention on the source of frustration would be related to greater distress. The findings indicated some support for this hypothesis, although there were also some results that were clearly inconsistent with this hypothesis.

*Child distress and child strategies (mother-uninvolved condition).* Analyses examining relations between distress and child strategy use indicated that children were more distressed when interacting with their mothers and less distressed when distracting or orienting toward the object of frustration during the mother-uninvolved condition. It is plausible to hypothesize that interacting with mother during the mother-uninvolved condition led to greater child distress because the mother was instructed to limit her interaction as much as possible during this portion.
of the task. Most children appeared to initiate interaction with mothers in this condition in an attempt to obtain their assistance in opening the container, likely making mothers’ unresponsiveness particularly distressing. However, given that correlations do not permit inferences about direction of effects, it is also possible that children who were more distressed were more likely to seek out interaction with their mothers.

The finding that toddlers were less distressed when engaged in distraction is consistent with our hypothesis and with results from other studies examining regulatory strategies of children younger than those in the current study. Buss and Goldsmith (1998) looked at emotion regulation strategies of 6-, 12-, and 18-month-old infants in a task designed to elicit frustration (i.e., attractive toy behind barrier). They found that infants at 12 months who were higher in anger expression used distraction significantly less than those infants lower in anger expression. In a more recent study, Crockenberg and Leerkes (2004) examined regulatory strategies of 6-month-old infants in a task designed to elicit distress with the presentation of a novel toy. In this study, infants who looked away from the novel stimulus were significantly less distressed than infants who used other strategies. Although our study did not control for direction of effects and thus cannot rule out the possibility that lower distress makes use of distraction more likely, Buss and Goldsmith as well as Crockenberg and Leerkes used sequential data analytic techniques that indicated that distraction was reliably followed by decreases in children’s distress. Taken together, the results of previous research and the present study offer some evidence to suggest that distraction may be an adaptive strategy in regulating negative affect during frustrating or distressing situations.

The data from this study indicating that toddlers’ use of object orientation was related to lower distress are inconsistent with a similar study by Grolnick, Bridges, and Connell (1996). In
this study 2-year-olds’ strategy use was examined in a frustrating situation in both mother-involved and mother-uninvolved conditions. Children who focused on the object tended to be the most highly distressed. However, one possible explanation for this discrepancy in findings involves the coding system used in the present study. Children coded as using object orientation in the present study may also have been engaged in adaptive regulatory behaviors and such behaviors were not fully captured by the coding system. Because of difficulties establishing reliability, the operational definition of object orientation was expanded to include all instances in which the child was holding the container. Thus, some children coded as oriented to the object may have been holding the container while engaging in additional behaviors to regulate their distress (e.g., singing a familiar song, playing a game with the container) and may or may not have had their attention focused on the container.

*Child distress and child strategies (mother-involved condition).* Consistent with our hypotheses, a significant positive association was found between child distress and venting. This finding is consistent with results from Calkins and Johnson (1998) in which 18-month-old toddlers’ distress was positively related to aggression/acting out behaviors (i.e., venting). These data suggest that this strategy may be ineffective in regulating negative arousal, but it is equally plausible that venting occurs only after children are highly distressed. Analyses from this study are unable to capture the direction of effects to determine this relation. No other significant relations were found between distress and child strategies in this condition when maternal strategies were take into account, suggesting that maternal behavior may play a larger role in affecting children’s distress than do children’s own strategies. Maternal behavior may have less impact on distress when children are engaged in venting behaviors because use of this strategy may be related to higher intensity distress (in addition to longer duration of distress). Although
we did not measure intensity of children’s distress systematically, coders’ subjective impressions were that children tended to engage in venting when they were highly distressed.

*Child distress and maternal strategies (mother-involved condition)*. Two significant relations emerged from analyses examining these variables in the mother-involved condition, controlling for child strategies. Child distress and maternal use of distraction were negatively correlated, consistent with the hypothesis that distraction may be effective in regulating child distress. As noted previously, the direction of effects cannot be determined in the present study or in the existing literature on maternal regulatory strategies and children’s distress. Thus, it is possible that mothers may choose to use distraction when children are displaying low levels of distress. Past literature is inconsistent with respect to relations between maternal distraction and toddlers’ distress in challenging or frustrating situations. Some studies have shown that maternal distraction is related to greater child distress when toddlers are required to regulate independently in a separate context (Grolnick et al., 1998), while other studies have found better toddler performance on a delay task when mothers used distraction (Putnam, Spritz, & Stifter, 2002). Other studies have obtained differing results as a function of child age (Spinrad et al., 2004). One possible explanation for some of these inconsistent findings is that maternal distraction is a useful strategy to regulate child distress when mothers are present to assist children, but that the benefit may not necessarily translate to instances in which toddlers are self-regulating (e.g., Grolnick at al., 1998; Spinrad et al., 2004). From a social learning perspective, children who are exposed to adults modeling distraction and who experience reductions in distress as a result should be more likely to adopt this strategy as their own. It may be that toddler-age children have simply not had enough exposure to this strategy and its effectiveness to implement it independently.
There was a significant positive correlation between child distress and mothers’ use of soothing and comforting in the involved condition, consistent with previous research (Crockenberg & Leerkes, 2004; Spinrad et al., 2004). It could be that soothing and comforting is an ineffective strategy for regulating distress because it encourages focus on the object of frustration. Alternatively, as previous researchers have suggested, it may be that soothing and comforting is a developmentally inappropriate strategy once children have acquired a broader repertoire of regulatory behaviors as well as linguistic skills (Spinrad et al., 2004). However, given the direction-of-effects issue, it is also important to recognize that a plausible interpretation of this finding is that mothers choose to use soothing and comforting when children are already very distressed.

**Child strategies and maternal strategies (mother-involved condition).** Controlling for child distress, there was a significant correlation between maternal use of distraction and child’s use of interacting with mother. This finding is consistent with results from a previous study indicating that toddlers oriented more toward their mothers or other objects in the room when mothers used distraction (Putnam et al., 2002). One interpretation of these data is that children find mothers’ distracting techniques more reinforcing than other maternal strategies, such as drawing attention to the object of frustration; therefore, they may be more likely to continue interacting with mother. We cannot rule out the possibility, however, that children’s interaction with mothers increases mothers’ use of distraction. There were also significant positive associations between maternal observation and the child strategies of distraction and object orientation. Neither of these child strategies were related to elevated levels of distress; therefore, mothers might have been more likely to watch children who were independently engaged and not highly distressed. Of course, it is also possible that mothers’ passivity may have made children more likely to
engage in object orientation or distraction rather than interacting with mothers. There was also a negative correlation between maternal observation and children’s use of interacting with mother. Again, it seems likely that when children initiated interaction in the mother-involved condition, mothers were likely to interact with them rather than simply observing. However, it is also possible that children were more likely to initiate interactions when mothers were observing children.

*Gender Differences in Children’s Negative Affect and Strategy Use*

Gender differences in children’s negative affect and strategy use in frustrating situations have been examined in a number of studies (Diener & Mangelsdorf, 1999; Grolnick et al., 1996) however, relatively few have found significant differences. Research examining gender differences in young children’s strategy use has yielded a few significant differences between boys and girls (Calkins, 2002; Raver, 1996), although these findings have not been replicated across studies. We did not expect to find gender differences in child distress because of the general absence of such findings in past research. We did hypothesize that boys would engage in higher levels of distraction (Raver, 1996) and venting (Calkins, 2002). Our results indicated no significant effects of gender on child affect or strategy use. One interpretation of the inconsistencies and null-findings within the literature on gender differences in emotional expression and regulation in early childhood is that the children in these studies are simply not old enough to have developed these gender-typed differences. As previously mentioned, more robust gender differences in emotional expression are seen around 4 years of age (Keenan & Shaw, 1997).
Maternal Behavior and Child Gender

The present study sought to examine whether maternal behavior in a task designed to elicit child frustration varied as a function of child gender. We did not have many specific predictions because of the inconsistency in previous literature. However, based on existing research, we hypothesized that mothers would engage in more passive behavior (i.e., observation) with boys than with girls (Grolnick et al., 1998). Additionally, we hypothesized that mothers would engage in higher levels of distraction with boys than with girls based on the finding that boys engaged in higher levels of distraction in one study (Raver, 1996). Results indicated that maternal strategies did not vary as a function of child gender. A final set of analyses examined whether child gender and child strategies interacted to predict maternal strategies, and there were no significant findings.

One partial explanation for the results of this study concerns the bidirectional nature of the mother-child relationship. As Calkins (1994) posits, maternal behavior may influence children’s behaviors, but children’s behavior and characteristics may also impact maternal behavior. Gender differences were not found in children’s behavior in this study. The fact that boys and girls behaved similarly in this study may be one reason that maternal behavior did not vary by child gender.

Previous research has been unable to provide a clear pattern of differing maternal behaviors as a function of child gender. However, the same cannot necessarily be said for the behavior of fathers. Indeed, in a number of studies fathers’ behavior to boys and girls differs more than mothers’ behavior (Chaplin et al., 2005; Kerig, Cowan, & Cowan, 1993; Lytton & Romney, 1991). Thus, another possibility is that fathers are playing a more central role than mothers in gender socialization.
Although the results from this study have failed to demonstrate relations between child gender and maternal behavior in a frustrating task, ample consideration should be given to the methodology and measures used that may account for these null findings. For example, the structure of the frustration task in this study and others like it may not lend itself to capturing subtle variability in maternal and child behavior. The fact that the child is alone with the mother without other stimuli aside from the object of frustration and a stack of magazines may limit the strategies children might use if they were in a more naturalistic setting. Likewise, it is expected that maternal strategies would also vary considerably more given supplemental resources (e.g., other toys or games to offer the child) and a less structured environment (e.g., moving outside with the child or into another room). Thus, one limitation of this study is the artificial setting of the laboratory, which may have hindered our ability to observe a wider range of strategies that children and their mothers use in a typical frustrating or emotionally challenging situation. Relevant to this point, to our knowledge there is only one unpublished study by Radke-Yarrow and Kochanska (1990) that used a naturalistic setting and their results showed that maternal behavior did vary as a function of child gender. Therefore, despite the practical challenges associated with naturalistic observation, future research may benefit from further examining mother-child interactions in the home setting.

The present study used an interval based coding system to measure maternal strategies and child strategies. The strategies coded were adapted from previous coding systems; however, due to difficulties in achieving reliability, some of these codes were collapsed into broader categories. A potential consequence of collapsing some of the strategy codes was that subtle behaviors of mother and child were not fully captured and this may have contributed to the non-significant findings for gender in the present study. It is hypothesized that subtle caregiver
responses in day-to-day interactions with children may shape gender-typed emotional behaviors. It could be, as Fivush (1998) suggested, that such subtle differences in caregiver behavior are difficult to detect without very sensitive coding schemes.

Finally, the small sample size may have had an impact on the results of the current study, particularly if gender-based effects on maternal behavior are small in magnitude. Given the inconsistent findings in past research and theoretical arguments suggesting that such effects are likely to be subtle (e.g., Fivush, 1998; Leaper, 2002), the possibility of small effect sizes seems likely.

General Limitations and Future Directions

There were a number of general limitations of this study in addition to those discussed in the previous section. A methodological complication of the study concerned the mother-uninvolved condition. During this condition mothers were present in the room, preventing them from being completely uninvolved in many instances. Although it would seem to make sense for the mother to leave the room completely for this portion of the task, a mother-absent condition may have presented other confounds. At 2 years of age separation anxiety is still present. Given the methodological complications associated with using a mother-absent condition, we used a mother-uninvolved condition with the realization that maternal behavior could not be completely standardized.

An additional limitation of the structured lab setting involves the issue of measurement reactivity. Mothers participating in the study were aware that they were being filmed through the one-way mirror throughout the visit. Although the instructions given to mothers made it clear that they should respond to children as they would in a typical situation, it is also likely that mothers’ behavior was affected by the knowledge that they were being observed.
The sample used in this study presents other limitations. As noted above, the small sample size may have had an impact on the results of the current study, particularly if gender effects are small in magnitude. In addition, the sample obtained for this study was relatively low-risk and homogeneous in terms of ethnicity, marital status, and educational level (i.e., predominantly European-American, well-educated, two-parent families). The nature of the sample may have affected some of our findings. For example, our data indicate that in the mother-involved condition most children spent the greatest proportion of their time interacting with their mothers. It is possible that in higher-risk, more stressed samples, mothers may not typically provide children with support to regulate their distress (i.e., mothers may ignore them or use ineffective strategies). If so, children’s strategy use might be different (e.g., less interaction with mother). Research directed at sampling from both high- and low-risk populations (e.g., Smith et al., 2004) is necessary to provide results that accurately depict the range of maternal and child regulatory strategies seen in the wider population.

The major purpose of this study was to examine maternal behavior as a function of child gender in an emotionally challenging or frustrating task. Although no significant effects were obtained in the current study, consistent with other studies on this topic, it is premature to assume these relations do not exist given the inconsistencies in the literature. Thus, future research should continue in this area by manipulating observational settings (i.e., naturalistic vs. structured), measurement systems (i.e., strategy codes) and participant dyads (i.e., father-child) in order improve our framework for understanding the nature and extent of gender-differentiated emotional responding.
REFERENCES


Table 1

*Descriptive Statistics for Proportions of Intervals: Child Strategies, Child Distress and Maternal Strategies by Condition*

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Max</th>
<th>M</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Child (M Uninvolved)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interacting</td>
<td>.00</td>
<td>1.00</td>
<td>.59</td>
<td>.33</td>
<td>66</td>
</tr>
<tr>
<td>Distraction</td>
<td>.00</td>
<td>.92</td>
<td>.13</td>
<td>.20</td>
<td>66</td>
</tr>
<tr>
<td>Venting</td>
<td>.00</td>
<td>.46</td>
<td>.04</td>
<td>.08</td>
<td>66</td>
</tr>
<tr>
<td>Object Oriented</td>
<td>.00</td>
<td>1.00</td>
<td>.22</td>
<td>.23</td>
<td>66</td>
</tr>
<tr>
<td>Duration of distress</td>
<td>.00</td>
<td>1.00</td>
<td>.29</td>
<td>.30</td>
<td>67</td>
</tr>
<tr>
<td><strong>Child (M Involved)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interacting</td>
<td>.39</td>
<td>1.00</td>
<td>.89</td>
<td>.15</td>
<td>60</td>
</tr>
<tr>
<td>Distraction</td>
<td>.00</td>
<td>.41</td>
<td>.06</td>
<td>.10</td>
<td>60</td>
</tr>
<tr>
<td>Venting</td>
<td>.00</td>
<td>.19</td>
<td>.01</td>
<td>.04</td>
<td>60</td>
</tr>
<tr>
<td>Object Oriented</td>
<td>.00</td>
<td>.57</td>
<td>.04</td>
<td>.09</td>
<td>60</td>
</tr>
<tr>
<td>Duration of distress</td>
<td>.00</td>
<td>.84</td>
<td>.18</td>
<td>.21</td>
<td>60</td>
</tr>
<tr>
<td><strong>Maternal</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attention</td>
<td>.00</td>
<td>.96</td>
<td>.28</td>
<td>.26</td>
<td>61</td>
</tr>
<tr>
<td>Distraction</td>
<td>.00</td>
<td>.96</td>
<td>.38</td>
<td>.28</td>
<td>61</td>
</tr>
<tr>
<td>Soothing</td>
<td>.00</td>
<td>.48</td>
<td>.11</td>
<td>.13</td>
<td>61</td>
</tr>
<tr>
<td>Observing</td>
<td>.00</td>
<td>.52</td>
<td>.12</td>
<td>.12</td>
<td>61</td>
</tr>
<tr>
<td>Reward</td>
<td>.00</td>
<td>.61</td>
<td>.07</td>
<td>.10</td>
<td>61</td>
</tr>
<tr>
<td>Command</td>
<td>.00</td>
<td>.64</td>
<td>.05</td>
<td>.10</td>
<td>61</td>
</tr>
</tbody>
</table>

*Note.* Means and standard deviations are based on proportion scores. Mean for distress is average number of total seconds.
Table 2

Child Strategies across Mother-Uninvolved and Mother-Involved Conditions (N = 59)

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child (M Uninvolved)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interacting</td>
<td>.58</td>
<td>.33</td>
</tr>
<tr>
<td>Venting</td>
<td>.04</td>
<td>.09</td>
</tr>
<tr>
<td>Object Oriented</td>
<td>.22</td>
<td>.26</td>
</tr>
<tr>
<td>Child (M Involved)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interacting</td>
<td>.89</td>
<td>.15</td>
</tr>
<tr>
<td>Venting</td>
<td>.01</td>
<td>.04</td>
</tr>
<tr>
<td>Object Oriented</td>
<td>.04</td>
<td>.09</td>
</tr>
</tbody>
</table>

Note. For venting, t-test was marginally significant, $t(59) = 3.0, p = .08$. 
Table 3

*Partial Correlations for Child Distress and Maternal Strategies (Mother-Involved Condition)* *(N = 60)*

<table>
<thead>
<tr>
<th>Maternal Strategy</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attention</td>
<td>.15</td>
</tr>
<tr>
<td>Distraction</td>
<td>-.30*</td>
</tr>
<tr>
<td>Soothing</td>
<td>.39**</td>
</tr>
<tr>
<td>Observing</td>
<td>-.15</td>
</tr>
<tr>
<td>Reward</td>
<td>.09</td>
</tr>
<tr>
<td>Command</td>
<td>-.01</td>
</tr>
</tbody>
</table>

*Note. Child strategies in the mother-involved condition were controlled for in this analysis.

* p < .05, ** p < .01
### Table 4

**Partial Correlations for Child Strategies and Maternal Strategies (Mother-Involved)**

(N = 60)

<table>
<thead>
<tr>
<th>Maternal Strategy</th>
<th>Interacting</th>
<th>Distraction</th>
<th>Venting</th>
<th>Object Oriented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attention</td>
<td>-.00</td>
<td>-.03</td>
<td>-.02</td>
<td>.05</td>
</tr>
<tr>
<td>Distraction</td>
<td>.27*</td>
<td>-.16</td>
<td>-.07</td>
<td>-.21</td>
</tr>
<tr>
<td>Soothing</td>
<td>.12</td>
<td>-.13</td>
<td>.06</td>
<td>-.09</td>
</tr>
<tr>
<td>Observing</td>
<td>-.70***</td>
<td>.45***</td>
<td>.19</td>
<td>.45***</td>
</tr>
<tr>
<td>Reward</td>
<td>.17</td>
<td>-.15</td>
<td>-.04</td>
<td>-.07</td>
</tr>
<tr>
<td>Command</td>
<td>-.04</td>
<td>.14</td>
<td>-.07</td>
<td>-.05</td>
</tr>
</tbody>
</table>

*Note. Child distress in the mother-involved condition was controlled for in this analysis.*

* *p < .05, ***p < .001*
Table 5

*Summary of Hierarchical Regression Analysis for Child Distress, Child Strategies and Child Gender Predicting Maternal Distraction (N = 60)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>ß</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distress</td>
<td>-.43</td>
<td>.18</td>
<td>-.32*</td>
</tr>
<tr>
<td>Interact</td>
<td>.13</td>
<td>1.40</td>
<td>.07</td>
</tr>
<tr>
<td>Distraction</td>
<td>-.32</td>
<td>1.48</td>
<td>-.12</td>
</tr>
<tr>
<td>Venting</td>
<td>-.63</td>
<td>1.76</td>
<td>-.08</td>
</tr>
<tr>
<td>Object Oriented</td>
<td>-.48</td>
<td>1.52</td>
<td>-.16</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distress</td>
<td>-.43</td>
<td>.19</td>
<td>-.32*</td>
</tr>
<tr>
<td>Interact</td>
<td>.11</td>
<td>1.41</td>
<td>.06</td>
</tr>
<tr>
<td>Distract</td>
<td>-.33</td>
<td>1.50</td>
<td>-.13</td>
</tr>
<tr>
<td>Venting</td>
<td>-.68</td>
<td>1.80</td>
<td>-.09</td>
</tr>
<tr>
<td>Object Oriented</td>
<td>-.49</td>
<td>1.53</td>
<td>-.16</td>
</tr>
<tr>
<td>Gender</td>
<td>-.02</td>
<td>.07</td>
<td>-.04</td>
</tr>
</tbody>
</table>

*Note. R² = .18, p < .05 for Step 1; ∆R² = .00 (ns) for Step 2.
  *p < .05*
Table 6

*Summary of Hierarchical Regression Analysis for Child Distress, Child Strategies, and Child Gender Predicting Maternal Soothing/Comforting (N = 60)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>ß</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distress</td>
<td>.27</td>
<td>.09</td>
<td>.41*</td>
</tr>
<tr>
<td>Interact</td>
<td>-.60</td>
<td>.65</td>
<td>-.64</td>
</tr>
<tr>
<td>Distraction</td>
<td>-.76</td>
<td>.70</td>
<td>-.59</td>
</tr>
<tr>
<td>Venting</td>
<td>-.46</td>
<td>.83</td>
<td>-.12</td>
</tr>
<tr>
<td>Object Oriented</td>
<td>-.76</td>
<td>.72</td>
<td>-.52</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distress</td>
<td>.27</td>
<td>.09</td>
<td>.41*</td>
</tr>
<tr>
<td>Interact</td>
<td>-.57</td>
<td>.66</td>
<td>-.62</td>
</tr>
<tr>
<td>Distract</td>
<td>-.75</td>
<td>.67</td>
<td>-.58</td>
</tr>
<tr>
<td>Venting</td>
<td>-.40</td>
<td>.83</td>
<td>-.12</td>
</tr>
<tr>
<td>Object Oriented</td>
<td>-.75</td>
<td>.72</td>
<td>-.51</td>
</tr>
<tr>
<td>Gender</td>
<td>.02</td>
<td>.03</td>
<td>.08</td>
</tr>
</tbody>
</table>

*Note. R² = .23, p < .05 for Step 1; ∆R² = .01 (ns) for Step 2.*

*p < .01
Table 7

Summary of Hierarchical Regression Analysis for Gender and Child Strategy, Interacting With Mother Predicting Maternal Distraction (N = 60)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interact</td>
<td>.08</td>
<td>.04</td>
<td>.28*</td>
</tr>
<tr>
<td>Gender</td>
<td>-.01</td>
<td>.07</td>
<td>-01</td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interact</td>
<td>.14</td>
<td>.00</td>
<td>.49*</td>
</tr>
<tr>
<td>Gender</td>
<td>-.01</td>
<td>.07</td>
<td>-.01</td>
</tr>
<tr>
<td>Interaction</td>
<td>-.09</td>
<td>.08</td>
<td>-26</td>
</tr>
</tbody>
</table>

Note. \( R^2 = .08 \), (ns) for Step 1; \( \Delta R^2 = .02 \), (ns) for Step 2.  
*\( p < .05 \)
Table 8

*Summary of Hierarchical Regression Analysis for Gender and Child Strategy, Object Orientation Predicting Maternal Observation (N = 60)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$SE_B$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.00</td>
<td>.04</td>
<td>-.01</td>
</tr>
<tr>
<td>Object Oriented</td>
<td>.07</td>
<td>.02</td>
<td>.45**</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.00</td>
<td>.04</td>
<td>-.00</td>
</tr>
<tr>
<td>Object Oriented</td>
<td>.03</td>
<td>.03</td>
<td>.23</td>
</tr>
<tr>
<td>Interaction</td>
<td>.05</td>
<td>.04</td>
<td>.26</td>
</tr>
</tbody>
</table>

*Note.* $R^2 = .20$, $p < .01$ for Step 1; $\Delta R^2 = .02$ (ns) for Step 2.
*Note.* The overall model for Step 2 was significant, $F(3, 56) = 5.31$, $p < .01$.

**$p < .001$**
Table 9

Summary of Hierarchical Regression Analysis for Gender and Child Strategy, Distraction Predicting Maternal Observation (N = 60)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>ß</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.00</td>
<td>.04</td>
<td>.00</td>
</tr>
<tr>
<td>Distraction</td>
<td>.07</td>
<td>.02</td>
<td>.45**</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.00</td>
<td>.04</td>
<td>.00</td>
</tr>
<tr>
<td>Distraction</td>
<td>.05</td>
<td>.03</td>
<td>.36*</td>
</tr>
<tr>
<td>Interaction</td>
<td>.02</td>
<td>.04</td>
<td>.12</td>
</tr>
</tbody>
</table>

Note. $R^2 = .20, p < .01$ for Step 1; $\Delta R^2 = .01$, (ns) for Step 2.

Note. The overall model for Step 2 was significant, $F(3, 56) = 4.89, p < .01$.

*p < .05, **p < .001
Table 10

*Summary of Hierarchical Regression Analysis for Gender and Child Strategy, Interacting with Mother Predicting Maternal Observation (N = 60)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>ß</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.01</td>
<td>.03</td>
<td>-.05</td>
</tr>
<tr>
<td>Interact</td>
<td>-.10</td>
<td>.01</td>
<td>-.70**</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.01</td>
<td>.03</td>
<td>-.05</td>
</tr>
<tr>
<td>Interact</td>
<td>-.09</td>
<td>.02</td>
<td>-.60**</td>
</tr>
<tr>
<td>Interaction</td>
<td>-.02</td>
<td>.03</td>
<td>-.12</td>
</tr>
</tbody>
</table>

*Note.* $R^2 = .48$, $p < .001$ for Step 1; $\Delta R^2 = .01$, (ns) for Step 2.

*Note.* The overall model for Step 2 was significant, $F(3, 56) = 17.71$, $p < .001$.

**$p < .001**
Appendix A

CODING MANUAL FOR NEGATIVE AFFECT

Goldfish Task: Start time is 3 min and duration is 2 min from knock time. If episode is curtailed early code latency to distress from the beginning of the task (when the door closes). Coding for duration of distress and intensity ratings start two minutes before the knock and continue for two minutes after the knock.

**Latency to Distress:** Number of seconds from start of task before child shows any negative affect (whine, fuss, cry, etc.)

**Duration of Distress:** Duration is coded in two different trials for both uninvolved and involved episodes. The time of those trials are rounded up if more than 50 mil-seconds. If there is more than 2 seconds difference between trial 1 & 2, a 3\textsuperscript{rd} or even a 4\textsuperscript{th} trial needs to be taken. Average all trials for final duration code.

Distress is coded based on the child’s vocalizations, but if facial expressions help to clarify an ambiguous vocalization they may also be used.

**Note:**
- If child says “no”, this should not automatically count as negative affect unless the child’s tone is whiny, fussy, etc.
- Sounds that reflect effort or are ambiguous should not be counted as negative affect

**Global ratings:** should reflect the level of distress child exhibits during involved and uninvolved episodes

**Intensity Ratings**

0: Neutral or Positive: the child exhibits no facial or verbal indicators of distress or shows positive affect  
(If child shows any negative affect then global can not be 0)

1: Very Mild Distress: the child makes some vocalizations indicating distress, but they are low-level (i.e., sound like a whine or grunt of anger) and short-lived

2: Mild Distress: the child engages in consistent low-level distress or the child shows intermittent higher-level distress (fussing, crying)

3: Moderate Distress: relatively consistent, higher-level distress, but brief periods where child shows a reduction in distress (doesn’t have to return to neutral)

4: Extreme Distress: continuous fussing/crying or screaming/tantrumming with continued escalation or no reduction in negative affect
Appendix B

CODING MANUAL FOR CHILD STRATEGIES

- The following information must be included for every coding sheet you fill out:
  1. Your name
  2. Date
  3. Indicate what you are coding for: training, reliability or final data
  4. Subject number
  5. Start time, knock time and end time

Also remember to fill out interval times before you begin to avoid confusion.

- PLEASE write clearly and do not write over your original codes. If you change your mind after watching an interval again and have to scribble a code out, please go back and make it clear what the code is (i.e., use white-out or scribble out your mistake entirely). If you are coding during training, a consensus coding sheet should be used to write down the decisions you and your partner make.

- Coders should code the first strategy or level of affect that occurs in an interval (see notes for clarification for exceptions to this rule).

CHILD STRATEGIES

2= Interacting with mother – the child is in close proximity to mother (they must be at least within the child’s arm length away to be considered within close proximity); the child is making verbalizations towards mother (e.g., “Look!” “Open”); is physically interacting (e.g., climbing on lap) with mother; and/or is looking at mother (i.e., their visual gaze is focused on mother).

3= Distraction - focusing attention on something other than getting the frustrating object (instances where focus is on the mother will not be coded as distraction). This may also include self-manipulative behaviors such as rocking or thumb sucking (i.e., self-soothing behaviors).

6= Venting - physical manifestations of distress that includes directing physical aggression toward the object of frustration, the mother or other objects in the room.

7= Object orientation
  A - Passive object orientation - holding, touching or manipulating the container with or without their visual attention. Looking at the container alone may be coded as passive object orientation, however ambiguous looks should be coded as distraction (i.e., glancing at the container from time to time should NOT count). Additionally, looking at the container must occur for at least 2 consecutive seconds to be coded as passive object orientation.
  B – Active object orientation - attempting to get into the object of frustration, and the child does so without involving the mother.

8= No strategy – instances where the child is crying with such intensity that visual attention is not able to be discerned.
Notes for clarification for child strategy codes:

- In an instance when the child is playing with something else (i.e., distraction) and the child is looking at mom from time to time (like she’s trying to talk or engage the child) then *distraction* should be coded and NOT *interacting with mother*. In other words, the child’s eye gaze must be fixated on mother to be considered *interacting with mother* (12-5-07).

- If the child goes out of frame, then the interval should be left blank (draw an X through the interval) (12-5-07). If the child is out of frame for the first half of the interval, do not code within that interval (code the next interval) (2-13-08).

- For code # 7 “involving mother” means that the child must actively pursue mom (i.e., it is a deliberate act by the child to involve mother) (1-26-08).

- When a child complies with a mother’s direct request, (e.g., “Just keep trying…”) you should code what the child’s behavior is and NOT *interacting with mother* (1-26-08).

- In an instance when the child is making vocalizations, you must assess 1) whether it is clear the child’s verbalizations are clearly directed towards the mother (e.g., asks mother a question, tells mother to look somewhere, directly addresses her name) and 2) whether or not the child’s eye gaze is towards the mother. In an instance when the child is making verbalizations and is looking at mom, code *interacting with mother*. If it remains unclear if the child is directly speaking to the mother and they are not looking at mom, code *distraction, object orientation 7a or 7b, or venting* (whichever is appropriate) (1-27-07).

- Exceptions to coding the first strategy in the interval: Code *venting* for an interval if these behaviors occur at any point during the interval (i.e., it doesn’t have to occur in the first half of the interval) (2-13-08).

- Code #2 clarifications:
  - Code *interacting with mother* regardless of whether the child is engaged with another object if they are talking to mom (2-13-08).
  - For the ‘mother involved’ condition, if mom picks the child up or places them in close proximity to her (or any physical interaction that mom initiates), code *interacting with mother* (2-13-08).
  - If the child is actively trying to open the container while meeting criteria for the proximity rule for *interacting with mother* (i.e., the child is within their arm’s reach to mom) code *active object orientation* and NOT interacting with mom. If the child is only looking at the container and is meeting criteria for *interacting with mother* (including the proximity rule) code *interacting with mother* (2-17-08).

- Changed definitions of venting, eliminated leave-taking and changed definitions of object orientation (2-22-08).
Appendix C

CODING MANUAL FOR MATERNAL STRATEGIES

- Write the date, name of coder, and indicate if you are coding for training, consensus, reliability, or for final data.
- Write all codes legibly and clearly mark out or erase all changed codes.
- Coders should code the first strategy that occurs in an interval, with the exception of code #6.
- All intervals are 5-seconds within the mother involved condition. Coding begins after the knock and ends 2-minutes after the knock.

Mother’s Strategies –
1 = *Drawing the child’s attention to the object of frustration* - verbal references to the object and/or pointing or gesturing toward the object.
2 = *Distraction* - engaging the child verbally in a topic other than the inability to obtain the object, or involving the child in an activity that is unrelated to the inability to obtain the object. If the mother uses the goldfish as a distraction (i.e. says “let’s count the goldfish”) this should be marked as distraction.
3 = *Soothing and comforting* - pleasant physical affection such as a gentle touch and/or pleasant tone in vocalizations.
4 = *Verbal explanation* - a reference to the emotion of the child and an explanation (e.g., “You are upset because you can’t have that toy”).
5 = *Bribery* - reference to a future consequence the child will receive if they comply with the mother’s request
   A= future reward - such saying to the child “stop crying now and we can get ice cream on the way home”.
   B= future punisher – such as saying to the child “if you break it you’ll be in trouble”.
6 = *Observing child* - focusing attention on the child, and not ignoring the child, but not responding to the child verbally or behaviorally.
7 = *Verbal command* – direct child to regulate emotion or behavior

Notes for Clarification:
- Code #5 Bribery- Any time that mom references the future code #5. For example, if mom says “you will get the goldfish later” this should be coded as 5A, bribery of a future reward. (Updated 1-25-08)
- Code #6 Observing Child– other codes override code #6. Code #6 in intervals where mom does not respond to the child verbally or behaviorally for the entire 5-seconds. (Updated 2-9-08)
- Code #1 Object Focus- If the mom gives a says “You do it” or “You can do it” regarding opening the container then a code of object focus should be given for that interval. (Updated 2-9-08)
- If the mom engages in soothing, comforting, and pleasant physical affection and at the same time also engages in another strategy, then the other strategy should be coded. (Updated 5-1-08)
o Any physical affection (even the child sitting in the mom’s lap) should be coded as soothing and comforting (strategy #3). (Updated 5-1-08)