TODDLERS' FRUSTRATION AND MATERNAL INVOLVEMENT: CHANGES FROM 24 TO 36 MONTHS

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ABSTRACT

The present longitudinal study examined how children's distress and regulatory strategies during a frustrating task were related to children's age and to maternal involvement (versus uninvolvement) in the task. Fifty-nine mother-child dyads were assessed when children were 24 and 36 months of age, a time period during which there is significant development in emotion regulation. It was hypothesized that as children got older their distress and regulatory strategies would vary less as a function of maternal involvement in the frustrating task. In general, this hypothesis was not supported. However, consistent with expectations, children displayed more distress at 24 months than at 36 months and showed more distress when mothers were not involved in the frustrating task than when they were involved. With respect to children's regulatory strategies, findings were complex and indicated that children's strategy use was dependent on age, maternal involvement, and type of strategy.

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INTRODUCTION

The ability to modify emotional responses in order to achieve desired goals is a major developmental accomplishment. For example, skills that allow individuals to decrease high levels of anger or frustration make it possible to interact with others appropriately and to persist in the face of challenging academic or occupational tasks. Infants and young children are highly dependent on external support from caregivers to modify their emotional reactions (e.g., calm down when they are angry). With development, children become increasingly able to regulate emotions independently. The purpose of the present study was to examine how children's distress and regulatory strategies during a frustrating task at 24 and 36 months are related to maternal involvement (versus uninvolvement) using a longitudinal design. It was hypothesized that as children get older, their behavior may vary less as a function of maternal involvement. In order to provide a framework for the current study, the following sections consider the definition of emotion regulation, the normative development of emotion regulation in infancy and early childhood, and factors related to individual differences in early emotion regulation.

What is Emotion? What is Emotion Regulation?

There is a considerable body of research on the topic of emotion regulation. To examine emotion regulation it is important to address the defining components of emotion. There are multiples theories of emotion and emotional development. However, current theorists agree that emotions are biologically based and have evolved over the history of the human species because of their survival value. Emotions allow humans to evaluate a situation or event and react appropriately (Cole, Martin, & Dennis, 2004). For example, an individual may see a large, barking dog and react with fear, which causes him/her to run away. This immediate feeling of

fear is adaptive because it keeps the individual from remaining in a potentially dangerous situation.

With no single theory of emotion in the literature, there is a corresponding lack of agreement about the definition of emotion regulation. However, one conceptualization that has features similar to others in the literature is that emotion regulation processes consist of ". . . 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). For example, if a child is denied a toy she desires she may become angry. Children deal with this anger in different ways, and one way a child may regulate these intense emotions is to use distraction and begin playing with a different toy, shifting her attentional focus from the object of desire and thus decreasing her anger.

Normative Development of Emotion Regulation

According to Kopp (1989), there are certain stages through which all children progress when developing emotion regulation skills. Even at birth infants are able to engage in some simple behaviors, often reflexes, which can alter unpleasant or distressful events (e.g., fatigue, cold, hunger, pain). These behaviors include head turning, sucking, and hand-to-mouth movement; for example, non-nutritive sucking may soothe infants (Kopp, 1989). As infants gain greater voluntary motor control and their visual system improves, they are able to regulate in new ways. By about 3 months infants have greater control over their head and limbs and can bring their arms and hands into their visual field as well as reach for objects. They can now use regulatory strategies such as turning away from unpleasant stimuli and self-distraction (i.e., voluntarily focusing attention on another stimulus). At this age, infants are still limited in their regulatory skills. Infants are only able to regulate on their own when levels of distress are

relatively low, and they are still reliant on caregivers to modify the cause of distress. In addition, the regulatory behaviors that infants engage in are not planned in advance or evaluated for effectiveness (Kopp, 1989).

By 12 months of age infants have made significant advances in their motor, cognitive, and socioemotional abilities. With these advances new emotion regulation skills continue to develop. For example, if when an infant has been distressed in the past caretakers have distracted the child with a toy, infants will learn to find an interesting toy on their own when they experience a state of distress or discomfort. Also beginning at about 12 months, infants' increasing maturation leads to greater exploration. Exploration allows infants to discover additional regulatory strategies. For example, a child may now find a new part of a toy that is useful for distraction and play with it when they are upset (Kopp, 1989). Infants are also increasingly able to communicate their exact needs to caregivers through the use of eye contact, gestures, and language, which make it easier for caregivers to aid in the process of emotion regulation. Caregivers remain very active participants in children's emotion regulation during the second year of life (Kopp, 1989).

By 2 to 3 years of age toddlers are increasingly advanced in their regulatory strategies. With the growth of memory recall skills, toddlers show more consistency in their regulatory skills. Toddlers are able to remember what behaviors worked in the past to alleviate their distress when they were in a similar situation. An example of this is when toddlers use what are referred to as "transitional objects." These are objects that toddlers seek out as a source of comfort (e.g., blanket, teddy bear) when they are experiencing distress.

Another characteristic of emotion regulation at this stage is that toddlers begin to show more effort to change the actual cause of distress or discomfort rather than just remove the

unpleasant feelings (Kopp, 1989). For example, when a child is unable to gain access to a desired object they may be more likely to work to gain access to the toy (e.g., open a container, remove a barrier) instead of only engaging in self-soothing behaviors (e.g., thumb-sucking). Finally, a major milestone in toddlerhood is the development of language skills. The use of language enables children to talk about their emotions. This allows for further development of emotion regulation because caregivers are able to discuss emotions with the child (Kopp, 1989). Caregivers can now talk to their children about the emotions they are experiencing and discuss a variety of strategies for dealing with those feelings in effective and socially acceptable ways. By the preschool years, children have developed many regulatory strategies and have the capability to control their attention in a way that leads to successful emotional and behavioral control (Calkins & Hill, 2007).

Individual Differences in Emotion Regulation

In general there is a normative pattern and typical stages that young children progress through in developing emotion regulation skills (Kopp, 1989). However, there are also many individual differences that young children display when learning to regulate their emotions independently. Calkins (1994) notes that individual differences may be seen in the strategies that are used as well as the developmental processes by which specific strategies are acquired. These individual differences in emotion regulation are hypothesized to play a role in children's interactions with peers and general adjustment (e.g., Calkins, 1994). Empirical research indicates that individual differences in emotion regulation are related to socioemotional adjustment and academic achievement. For example, difficulties in self-regulation have been associated with externalizing and internalizing behavior problems (e.g., Calkins & Howse, 2004), deficits in social competence (e.g., Blair, Denham, Kochanoff, & Whipple, 2004; Calkins

& Hill, 2007), and deficits in academic achievement (e.g., Graziano, Reavis, Keane, & Calkins, 2007).

Influences on Individual Differences in Emotion Regulation

The development of emotion regulation is hypothesized to be affected by both "intrinsic" factors (i.e., biologically-based influences such as child temperament) as well as "extrinsic" factors (i.e., environmental influences such as caregiver behavior). Parents and other caregivers are believed to play an extremely important role in the development of emotion regulation in young children (e.g., Calkins, 1994; Kopp, 1989; Thompson, 1994). Early in development, infants are completely dependent upon caregivers for fulfilling their physical and emotional needs. As young children develop caregivers serve as their primary models and teachers. Parents who consistently use effective emotion regulatory strategies with their children will be more likely to have children who later use effective strategies on their own (Calkins & Hill, 2007). For example, if a child is upset because she cannot find a certain toy she desires, a parent may distract her by redirecting her attention and getting her interested in a different toy. Over time, this child may learn that this strategy is effective in decreasing her level of distress and use distraction as a strategy when experiencing distress in a similar situation. When children develop language skills, parents can teach children regulatory strategies even more directly and provide explanations of when and how children can use certain strategies (Calkins & Hill, 2007). Without this critical involvement of caregivers, children will have great difficulty developing regulatory strategies and learning to regulate emotions on their own.

As Calkins (1994) points out, it can be very difficult to study the many factors that may influence individual differences in emotion regulation. Factors can be intrinsic (e.g., neuroregulatory systems, behavioral traits, cognitive components) or extrinsic (e.g., caregiver

styles and/or explicit caregiver training). There are disagreements in the literature about which factors have more influence on individual differences in emotion regulation, although researchers are generally in agreement that a combination of intrinsic and extrinsic factors are involved (Calkins, 1994; Calkins & Hill, 2007; Cole et al., 2004).

Calkins (1994) has proposed a model that focuses on the idea that intrinsic and extrinsic factors work in a bidirectional manner and influence individual differences in the development of emotion regulation. The model begins with neuroregulatory mechanisms (i.e., ANS/CNS reactivity) that predispose infants to certain behavioral traits (temperament characteristics). For example, one temperament dimension on which infants differ is their reaction to control and to barriers to exploration. Some infants are highly reactive to these stimuli and become angered or frustrated much more quickly, easily, and with greater intensity than do other infants. In Calkins' model, caregivers will engage in particular parenting behaviors or strategies based in part on the behaviors that are displayed by the infant or child. According to the model, caregiver behavior can affect children in multiple ways. First, caregiver behavior has an effect on a child's emotional reactivity in the immediate situation. For example, a caregiver who responds to a child's frustration by yelling at him or ignoring his distress is likely to increase the child's anger in that situation. In addition, caregivers' behavior affects children's regulatory style. For example, a parent who exerts high levels of control over an easily frustrated child may foster the development of a "coercive, angry" regulatory style that is more likely to lead to aggressive interactions with peers. However, a parent who is less controlling and more supportive with an easily frustrated child may foster the development of an "independent, exploratory" regulatory style, which is more likely to lead to sociable interactions with others (Calkins, 1994, pp. 63-64). One way in which caregivers' behavior is hypothesized to affect the development of these

regulatory styles is by influencing children's beliefs about the caregiver and the environment more generally. For example, highly controlling parents of an easily frustrated child may foster the belief that the environment is generally hostile and that the child should respond with anger to parental behavior, setting up a cycle of "coercive" interactions with parents that generalizes to encounters with peers. In contrast, parents who are less controlling and more supportive of an easily frustrated child will foster the belief that the environment is generally friendly, leading to a more exploratory and approach-oriented regulatory style that promotes sociable interactions with peers.

Although Calkins' (1994) model suggests different ways in which parents and other caregivers can affect children's temperamental reactivity and regulatory style, the model also posits that for children who are highly biologically and thus behaviorally reactive, this reactivity will more strongly influence their regulatory style than will caregiver behavior. In general, children who are easily frustrated are hypothesized to have greater difficulty than less easily frustrated children in developing effective regulatory strategies even in the context of supportive caregiving.

Maternal Behavior and Young Children's Emotion Regulation

As noted above, the purpose of the present study is to examine how children's distress and regulatory strategies during a frustrating task at 24 and 36 months are related to maternal involvement (versus uninvolvement) using a longitudinal design. It is hypothesized that as children get older, their behavior may vary less as a function of maternal involvement. In order to provide a framework for the current study, the following section provides a review of studies that have examined distress and emotion regulation in young children; most of these studies also examine how maternal involvement (versus uninvolvement) or specific maternal regulatory

strategies are associated with children's distress or emotion regulation. All of these studies examined either one age group or used a cross-sectional design. Because none of the studies used a longitudinal design, it was not possible to examine stability or change in individual children's behavior over time.

As part of a study on emotion regulation, Calkins and Johnson (1998) examined the relation between distress to frustrating tasks and the regulatory behaviors displayed by 73 18-month-old toddlers in frustrating situations. Four frustration tasks were used: a plastic barrier task, a food denial task, a high chair task, and a Plexiglas barrier task. In the plastic barrier task, the mother and child were given a small windup toy to play with. After 1 min of play, mothers placed the toy into a clear plastic container and tried to limit interactions with their children other than asking them to try to get the toy. For the food denial task, an experimenter placed crackers in a sealed plastic bag and told the children they could not have the crackers until playtime was finished. For the high chair task, the child was placed in a high chair and asked to wait for a special toy for 5 min while the mother sat nearby reading a magazine; the mother was asked not to remove the child from the high chair. The fourth frustration task involved giving a child a toy while sitting at a table. After allowing the child to play for a 1 to 2 min, the toy was placed behind a Plexiglas barrier and out of the child's reach.

The child's reactivity during each task was coded by combining measures of the latency, intensity, frequency, and duration of distress. For each task, the following regulatory behaviors were coded as present or absent during 10 s intervals: *self-comforting* (e.g., thumb sucking), *distraction* (attending to or manipulating an object other than the unattainable stimulus), *aggression/venting* (banging, kicking, hitting, or throwing object of frustration), *mother-orientation* (retreating to mom, asking mom for help, talking to or playing with mom, or pulling

on mom), or *constructive coping* (any effort to open box, bag, or high chair, or any attempt to retrieve toy from behind barrier). It was hypothesized that children who showed more distress during frustrating tasks would engage in more aggression/venting and less distraction and constructive coping than would children displaying less distress.

Results showed that all of the regulatory behaviors were significantly correlated with distress. Toddlers who showed greater distress were more likely to bang, kick, hit, or throw objects (venting), and were less likely to attend to or interact with their mothers, to distract themselves with other objects, or to try to overcome the barriers in their way (constructive coping). Overall, it was found that the tendency to become distressed in the frustrating situations was related to the tendency to use aggressive and acting-out behaviors. The tendency to be distressed was negatively related to regulatory behaviors such as distraction, seeking out the mother, or constructive coping. There were no significant gender differences in regulatory behaviors.

Grolnick, Bridges, and Connell (1996) conducted a study with 37 toddlers and their mothers to investigate emotion regulation strategies and emotional expression in 24-month-olds. Different situations that did and did not include an adult were used to examine associations between emotion regulation strategies and distress within and across different situations. A food and a gift delay procedure were used for frustration tasks. In the gift delay task an experimenter entered the room with a present for the child, let him/her see it, then placed the gift on a shelf out of the child's reach and left the room for 6 min. In the food delay task children were presented with a plate of crackers; the experimenter ate one in front of the child and said, "Mmm, that tastes good. These are for later. I need to do some things outside. I'm going to put them away for a little while and when I get back, you can have them. I'll be right back." The experimenter

then placed the plate on a shelf out of the child's reach and left the room for 3 min. After 3 min the experimenter returned, gave the child one cracker, and then placed the plate back on the shelf and left the room for another 3 min. In the parent-passive condition the mothers were instructed to stay in their chair and not initiate interactions with the children. In the parent-active condition mothers were told they could interact with their children any way they liked as long as they did not give the child the gift or snack. Each dyad experienced a parent-passive and a parent-active condition for the gift delay task and the snack delay task.

Emotional expression was coded using scales that were created by Thompson and Lamb (1984). Emotional expression was based upon facial expression and vocalization and coded in 5 s intervals. Emotion regulation strategies were coded in the same 5 s intervals and consisted of six categories. The categories used were: *active engagement with a substitute object* (active play with a toy or with the parent/experimenter), *passive use of objects and exploration* (behaviors oriented to the environment without active task engagement such as looking at toys and exploring the room), *symbolic self-soothing* (statements or activities indicating use of cognitive/symbolic ways to deal with frustration such as "She'll be right back" or "I'm a big girl"), *physical self-soothing* (bodily-directed behaviors such as thumb-sucking and using familiar objects for comfort or security), *other-directed* (comfort-seeking behaviors such as wanting to be held), and *focus on the delay object/ search for parent* (behaviors indicating child was focused on the delay object such as asking "When do I get my present?").

Results showed that children showed significantly more distress in the parent-passive conditions. Distress was negatively related to children's active engagement with substitute objects and positively related to children's focus on the delay objects. Across tasks and conditions, the most frequently used strategy was active engagement with a substitute object.

This finding suggests that by 24 months children are capable of reorienting their attention toward another object in their environment when experiencing distress (Grolnick et al., 1996). Although it was used most frequently regardless of task or condition, this strategy was used the most when an adult was available and participatory. Since active engagement was shown more in the parent-active than parent-passive conditions, these results show the importance of adult involvement for the use of active engagement by toddlers. Although some evidence suggests that males and females may differ in their responses to frustration (Goldberg & Lewis, 1969), no gender differences in strategy use were found.

An additional study by Grolnick, Kurowski, and McMenamy (1998) examined specific strategies mothers used to help regulate their toddlers' distress. The study used a cross-sectional design and the participants included 140 mothers and their children (18, 24, or 36 months). There were two frustration tasks identical to those used by Grolnick et al. (1996) and maternal involvement (active or passive) was also varied across tasks in the same way as in Grolnick et al.'s study. Mothers' regulatory strategies were coded in 5 s intervals during the parent-active conditions. The six strategies were: *active game-like engagement* (actively played with child or engaged in game-like activity), *redirection of attention* (behaviors to distract child or redirect child's attention away from desired object), *reassurance* (assuring child they will soon get the object with statements such as "You can eat the crackers when she gets back"), *following* (reflecting, extending, or elaborating upon the child's distress with statements such as "I know you want the cracker"), *focus on desired object* (focusing attention on the object without instigation by the child), or *physical comforting* (e.g., hugging, picking up child). Intervals were coded as passive if the mother did not interact with the child for the entire interval. Intervals were coded as *other behavior* if the mother was not passive but did not use any of the six

regulatory strategies. Children's emotional distress was coded based upon facial and vocal expressions. There were two strategies (active engagement and physical comfort) that could be initiated by the child or the mother. For these two strategies, *mother-initiated* was coded if the mother initiated a game with the child, or if the mother picked up the child without the child's request. Strategies were coded as *child-initiated* if the child initiated a game in which the mother engaged or if the child gestured to be picked up by the mother.

Results showed that mother-initiated active engagement decreased as children got older while child-initiated active engagement increased. Overall, mothers were found to engage in less active engagement with older than with younger children regardless of whether the active engagement was initiated by mothers or by children. Also, mothers who initiated more active engagement, used more redirection of attention, more reassurance, and more physical comforting in the parent-active conditions had children who showed more distress in the parent-passive conditions even after controlling for children's distress in the parent-active conditions. Mothers who were more passive and exhibited more non-strategy behavior in the parent-active conditions had children who were less distressed in the parent-passive conditions. The strategies that mothers use with their toddlers are important because strategies that mothers use in response to their toddlers' arousal are thought to shape the children's later emotional reactions when the mother is not available (Grolnick et al., 1998). It should be noted that one limitation of this study is the *other behavior* category. Non-strategy behavior that is considered to be in this category is not clearly defined so it is unknown what mothers were doing when this category was coded and unclear why these behaviors might be related to less child distress.

Stansbury and Sigman (2000) conducted a study with 52 parent-child dyads. The purpose of this study was to describe 3 and 4-year-olds' responses to frustration, examine

developmental differences in responses to frustration that might index emotion regulation, and observe and quantify parental contributions to children's responses during frustrating episodes. Two different tasks were used to elicit frustration in the children. In the clean-up/compliance task the child was shown a Marbleworks toy and then the experimenter took it apart. The child was told to put the toy back together. Once the child finished constructing the toy, the experimenter entered and took away the marble before the child had a chance to play and instructed the child to clean up the remaining toys. In the candy task, parents were taken out of the room and asked to do whatever they would normally do when they did not want their children to eat something. While the parent was outside the room, the experimenter brought the child some toy blocks and allowed them to choose a piece of candy. The experimenter told the child, "It's okay with me if you eat it right now, but you need to check with your mom first, okay?" Mothers then returned to the room and denied the child permission to eat the candy.

Children's behavior was coded in four categories: *comforting* (self-soothing; behaviors that function to soothe the internal experience of negative emotion), *instrumental behaviors* (child states or restates request, child contradicts mother's reasons, child gives reasons mother should grant request, and/or child disregards instructions—i.e., eats candy or takes toys out of the box), *distraction* (focuses attention away from a frustrating or negative emotional situation), and *cognitive reappraisals* (child asks for explanations of denied request, child bargains or compromises, and/or child attempts to view a frustrating or other negative emotional event in a more positive manner—e.g., child makes a game out of clean-up, or child gives the candy to his mother and declares himself a "Good boy!"). Mothers' behavior was also coded in four categories: *comforting* (physical or verbal), *instrumental regulation* (gives in to child's request, suggests ways to fix situation, or compromises/ bargains with child), *distraction* (directs child to

alternative activities), and *cognitive regulation* (attempts to explain/ reason with child, threatens child, or states authority).

Results of this study indicated that older children (4-year-olds) used fewer strategies than did younger children (3-year-olds). At both ages instrumental behavior was the most common strategy used in both frustrating situations and comforting was the least frequently used strategy. However, when the behaviors included in the instrumental category were examined individually, 3-year- olds were more likely to state or restate a request for the desired object and also more likely to take the prohibited object than were 4-year-olds. Also, 3-year-olds used proportionally more instrumental strategies during the clean-up than during the candy episode, but 4-year-olds used relatively the same percentage in both episodes. Parents of 3-year-olds were found to use more instrumental regulation than parents of 4-year-olds. Results did not show any significant gender differences in strategy use.

A study by Diener and Mangelsdorf (1999) explored how maternal involvement was related to children's behavioral strategies during frustration and fear tasks. The summary focuses on the frustration tasks because they are most relevant to the current study. Ninety-four mothers and their children (18 or 24 months) participated. Children were exposed to two stimuli to elicit frustration for 6 min. For the first 3 min mothers were uninvolved ("constrained"); they were asked not to initiate interactions with their children and to respond to initiations by the child as briefly as possible. For the remaining 3 min, mothers were told to behave as they normally would but not to give the child the desired object. The first situation to elicit frustration involved giving the child a Big Bird doll that talked. Once the child was involved, the experimenter took the doll away and put it out of the child's reach but within sight. In the second situation designed to elicit frustration, children were given graham crackers in a Ziplock bag and told they could

have a snack in a few minutes. Behaviors that were coded in 15 s intervals were*: fussing to mother* (negative distress clearly directed at mother in an attempt to change her behavior), *help seeking* (child asks for assistance with stimulus), *social referencing* (child looks at mother's face), *engaging mother* (child attempts to engage the mother in interaction), *distraction* (focusing attention on another object), *leavetaking* (child attempts to leave room, says "bye-bye"), *avoidance* (child moves or turns away from stimulus), *playing with the stimulus, problem solving* (constructive attempts to change stimulus, e.g. trying to open bag), *tension release* (high-intensity motor behavior, e.g. stomping feet or banging stimulus), and *self-soothing* (e.g., thumb-sucking, twirling hair). The predominant emotion (fear, anger, or positive affect) was coded in each 15 s interval based on the child's facial expression. The intensity of the expression was also coded for each emotion.

Results showed that children's behavior showed significant differences when mothers were involved versus uninvolved. There was more help seeking when mothers were uninvolved, and more engaging, social referencing, playing with the stimulus, and leavetaking when mothers were involved. In addition, the strategies of problem solving and leavetaking were predicted by an interaction between maternal involvement (involved or uninvolved) and type of task (fear or frustration). During the frustration tasks but not the fear tasks, children showed more leavetaking and less problem solving in the involved condition than in the uninvolved condition. Results did not differ by child age or gender.

In addition to correlational analyses, sequential analyses were used to examine changes in children's predominant affective expression (i.e., increases, decreases, or no change) following the use of a particular child strategy. Results showed that frustration significantly decreased following use of the fussing to mother strategy in both the mother-uninvolved and involved

conditions. Results also indicated that the strategy of tension release decreased frustration more than expected by chance. Two strategies, social referencing and leavetaking, were more or less effective depending upon maternal involvement. When mothers were uninvolved, social referencing and leavetaking were followed by a significant decrease in frustration, but the pattern of change was unclear when mothers were involved. Overall, the effectiveness of the behavioral strategies changed depending on maternal involvement.

In general, results of studies that have examined young children's use of regulatory strategies, as well as those that have also examined maternal involvement or strategy use, indicate some consistent findings. These findings are summarized below. It should be noted that despite some similar findings across studies, it is somewhat difficult to compare results across studies because different strategies were coded, somewhat different frustration tasks were used, maternal involvement in the tasks varied, and children of different ages were examined.

There are many individual differences in children's use of regulatory strategies in response to frustration, but there also appears to be a normative pattern of development. In general, theories of emotion regulation posit that children become less dependent on external support in regulating their emotions as they grow older (Calkins & Hill, 2007; Kopp, 1989). Although empirical studies in very young children are somewhat limited, there are data suggesting that between 18 and 36 months, child-initiated engagement with parents increases and mother-initiated engagement with children decreases during frustrating situations, indicating that children are taking a more active role in their own emotion regulation. These data also indicate that across the period from 18 to 36 months, mothers' overall use of active engagement (i.e., actively playing with a child or engaging in game-like activity) decreases regardless of whether it is initiated by the child or by the mother (Grolnick et al., 1998), suggesting that children become

less reliant on caregiver support in frustrating situations across this time period. However, some research has failed to find age differences in children's regulatory strategies and their associations with maternal involvement over the period from 18 to 24 months (Diener & Mangelsdorf, 1999). As children move through the preschool years, there are data indicating that 3-year-old children tend to use a greater variety of regulatory strategies than do 4-year-old children (Stansbury & Sigman, 2000), potentially suggesting that older children have learned which strategies are most likely to be effective. Findings also suggest that 3-year-old children use certain "instrumental" strategies (i.e., stating that they want the desired object or simply taking the desired object) more than 4-year-old children do (Stansbury & Sigman, 2000).

With respect to individual differences, there are associations between children's use of regulatory strategies and their level of distress during frustrating tasks. Calkins and Johnson (1998) found that venting (i.e., aggressive behavior) was associated with greater distress and Grolnick et al. (1996) found that children showing greater distress were more likely to focus on the object of frustration. On the other hand, children who show lower levels of distress are more likely to use regulatory strategies in which they redirect their attention away from the source of frustration to another object or to a person (Calkins & Johnson, 1998; Grolnick et al., 1996). In addition, Calkins and Johnson (1998) found that children who attempted to remove obstacles to the desired object (i.e., used constructive coping) also showed less distress. In both of these studies, as well as in most others, it is impossible to tease apart the direction of effects because sequential analyses were not used. Thus, although it is tempting to conclude that certain regulatory strategies (e.g., distraction) may be more effective because they decrease children's distress, it is also possible that children who are initially less distressed are more likely to use these strategies.

Finally, findings across studies indicate relations between maternal involvement or specific regulatory strategies and individual differences in children's distress and strategy use. Children's behavior tends to differ depending on whether mothers are involved versus uninvolved. In general, when parents are uninvolved children tend to show higher levels of negative affect (Grolnick et al., 1996; Diener & Mangelsdorf, 1999). Some data indicate that children demonstrate the use of both more help-seeking behavior and more independent problem-solving behavior when mothers are not involved and the greater use of a variety of strategies (i.e., looking at and attempting to engage the parent, playing with the frustrating stimulus, and attempting to leave the situation) when mothers are involved (Diener & Mangelsdorf, 1999). Children's behavior in frustrating situations in which mothers are not involved is also correlated with maternal behavior in frustrating situations in which mothers are involved. Grolnick et al. (1998) found that mothers who initiated more active engagement, used more redirection of attention, more reassurance, and more physical comforting during frustrating tasks had children who showed more distress when required to regulate independently. Mothers who were more passive and exhibited more non-strategy behavior had children who were less distressed when regulating independently. Because data are relatively limited and methodologies and findings vary across studies, the relations between maternal involvement and young children's use of regulatory strategies remain unclear.

Rationale and Hypotheses

Existing studies have examined how distress and emotion regulation in young children are associated with maternal involvement (versus uninvolvement) and with specific maternal regulatory strategies. In general, models of emotion regulation indicate that children become increasingly independent in their emotion regulation with age (e.g., Kopp, 1989). To date, no

study has examined how maternal behavior (involvement versus uninvolvement) is related to children's distress and strategy use at 24 months and 36 months using a longitudinal design. Although the current study shares limitations of preceding research (e.g., a correlational design), it has the potential to add to existing research for at least two reasons. First, the current study examined children at 24 and 36 months, a period that generally encompasses significant development in self-regulation (Kopp, 1982). Previous research (Grolnick et al., 1998) suggests that children become less reliant on caregiver support in regulating frustration between 18 and 36 months. However, Diener and Mangelsdorf (1999) found that relations between child strategy use and maternal involvement did not vary by age in a sample of 18- and 24-month-olds. Thus, the limited existing data suggest that the period between 24 and 36 months of age warrants greater attention, with the possibility of significant change in children's reliance on maternal involvement to regulate negative emotion. Second, the current study utilized a longitudinal design. It was possible to examine stability and change in individual children's distress and strategy use across this developmental period. Although children show significant improvement in their ability to regulate negative emotions with age, cross-sectional designs do not make it possible to determine whether individual children's level of distress and/or use of specific regulatory strategies show any stability across the period from 24 to 36 months.

The current study examined the following hypotheses:

1. Although there is not past research to inform hypotheses, it was expected that there would be stability in individual children's distress from 24 to 36 months. It was hypothesized that children who show more distress at 24 months (relative to their peers) also would show more distress at 36 months. It was also hypothesized that children's

regulatory strategies would show stability between 24 and 36 months, although this hypothesis was more speculative.

2. Based on past research it was hypothesized that children would show less distress during the frustration task at 36 months than they would at 24 months. It was also expected that specific strategies would differ in frequency of use at 24 and at 36 months, with older children generally showing less involvement with mothers and less aggression/acting-out behavior. Specifically, based on past research it was hypothesized that children at 36 months would demonstrate less interaction with mothers, less venting, more distraction, and more object orientation than will children at 24 months. With respect to object orientation or focus on the frustrating object, findings are mixed. Although focus on the frustrating object is associated with greater distress in some studies, Calkins and Johnson (1998) found that children who were more focused on trying to remove the barriers to desired objects showed less distress. It was expected that 36-month-olds would show more problem-solving behavior than would 24-month-olds, and for this reason it was hypothesized that object orientation would be more frequent at 36 months.
3. It was hypothesized that children's strategy use would differ across the uninvolved and involved conditions. Given the inconsistency in the methodologies and findings of past research, it was difficult to form specific hypotheses. However, we expected that children would show greater engagement with mothers when mothers were involved than when mothers were uninvolved. When mothers were uninvolved, children were expected to use a greater variety of strategies. Specifically, it was hypothesized that children would engage in less interaction and more venting, distraction, and object orientation in the uninvolved than in the involved conditions.

4. In addition to the main effects hypothesized above, it was expected that there would be interactions between age and condition in predicting children's distress and strategy use. Such interactions would qualify the interpretation of any main effects of age or condition. More specifically, it was hypothesized that maternal involvement would have a greater effect on the behavior of 24-month-olds than on the behavior of 36-month-olds. If so, there should be more differences in children's behavior between the uninvolved and involved conditions at 24 months than at 36 months. For example, children's distress may decrease more sharply as a function of maternal involvement at 24 months than at 36 months. In addition, children become more independent in their regulatory skills with age. Thus, maternal involvement may have less impact on children's strategy use when 36-month-olds are confronting a frustrating task than when 24-month-olds are facing an emotional challenge. If so, children's strategy use should vary less across conditions at 36 months relative to 24 months.

METHOD

Participants

Participants were 59 typically developing toddlers (33 boys, 26 girls) and their mothers. The current study was part of an ongoing, short-term longitudinal study on emotional development. At the first visit children ranged in age from 23 to 26 months and mothers ranged in age from 25 to 45 years (M = 33.72, SD =3.69). At the second assessment, children ranged in age from 35 to 40 months. All children included in the study were healthy with no history of developmental delays. Participants were recruited through public birth records in a small southeastern city in the United States. Letters were sent to potential participants with an explanation of the purpose of the study and the general procedures involved and to inform

parents that they would be receiving a phone call to ask about their interest in participating. Research assistants then called the potential participants and provided parents with more information about the study and answer any questions. If mothers agreed to participate, the research assistant scheduled their assessment. Mothers were offered $20 for their initial visit and $20 for their participation in the follow-up assessment. The majority of the sample consisted of European American families (92.7%) with some African American (3.6 %), Hispanic (5.5%) and Native American (1.8%) families. Most of the children (96.5%) were from two-parent households, with only 3.5% living in single-parent homes at 24 months. Maternal education levels were relatively high. At the 24 month assessment, 5.3% of mothers had obtained a high school degree or GED, 12.3% had some post-high school education, 26.3% had an associate's degree, 36.8% had completed a bachelor's degree, and 19.3% had earned a graduate degree.

Materials

Assessments took place in a laboratory playroom that was furnished with a small, child-sized table and chair, an adult chair, and a larger, taller table that was used to place some materials out of the child's reach. A one-way mirror was built into one wall of the playroom. Filming took place through the one-way mirror from a smaller, attached camera room.

Procedure

24 month assessment. During the initial assessment at 24 months, a frustration task took place during part of a longer assessment. A task adapted from Diener and Mangelsdorf (1999) that was designed to elicit frustration was used. This task included the use of a small, clear plastic Tupperware container with approximately 0.5 oz (15 g) of goldfish crackers. When mothers were called to schedule the visit, they were asked if the child liked goldfish crackers and if the child did not a comparable substitute was used. The Tupperware container was clear and

allowed the child to see the contents inside but it had a lid that a toddler cannot open, making it impossible for the child to get to the goldfish crackers.

Before the task began written instructions were given to the mother to explain her role in the task and to serve as a reminder of the instructions throughout the task. The instructions asked the mother to sit in her chair and read magazines in order to limit interaction with the child for the first half (3 min) of the task. Each mother was instructed not to initiate interactions with her child and if the child talked to her to respond as briefly as possible (e.g., "I'm busy right now"). The instructions explained that after a few minutes the experimenter would knock on the one-way mirror from the camera room. The instructions indicated that after hearing the knock the mother was allowed to interact with her child as she normally would but should not open the container for her child. The written instructions also indicated that if at any point throughout the task the mother felt that her child was becoming too distressed, she may feel free to either stop the task or just begin comforting her child as she normally would.

The experimenter running the lab visit gave the mother the written instructions and after she read them made sure that all questions were answered. The experimenter also reiterated to the mother that she should not open the container for the child after hearing the knock. After any questions were answered, the experimenter re-entered the room with the container of goldfish crackers. The experimenter tried to get the child to take the container from her. If the child would not come to the experimenter, she set the container on the floor. She said, "There's a treat in here. You can have it in a few minutes." After this the experimenter left the room. After 3 min passed, the experimenter knocked on the mirror to indicate to the mother to interact with her child normally. After another 3 min, the experimenter entered the room and opened the container for the child.

If a child cried continuously for 15 s or more during the beginning half of the task, the experimenter knocked early and signaled the mother to interact with her child. If during the second half of the task the child cried for more than 15 s continuously, the experimenter entered the room early and opened the container for the child.

36 month assessment. When children were approximately 36 months old, mothers were contacted to schedule their second assessment. A distress task from the preschool version of the Laboratory Temperament Assessment Battery (LAB-TAB; Goldsmith & Reilly, date unknown) was used as part of a longer assessment. Materials for this task included an animal hospital toy with different animals and veterinary accessories, a clear container that locked with a padlock, and a key ring of gold keys that did not open the lock. The clear container allowed the child to see the toy inside the box, but it was impossible for the child to open the box because the correct key was not provided.

Before the task began the mother was given written instructions that explained the procedure for the task. The instructions informed the mother that the keys the child had would not open the box. They were asked to sit in their chair, read magazines, and not initiate any interactions with the child. Similar to the frustration task at 24 months, mothers were told that if the child tried to talk to them or wanted their attention to respond as briefly as possible (e.g., "I'm busy right now"). The instructions indicated that after a few minutes mothers would hear a knock on the one-way mirror which would signal that they may interact with the child as they normally would. The instructions also indicated that if mothers felt that the child was becoming too distressed they could stop the task at any time or just begin comforting the child.

The experimenter answered any questions that the mother had before beginning the task and then retrieved the necessary materials from the camera room. The experimenter returned

with the box with the padlock on (unlocked), the ring of gold keys, and the animal hospital inside the box. The experimenter encouraged the child to sit down on the floor facing the mirror. The experimenter sat next to the child, opened the animal hospital, and showed the child the accessories and the animals in the different cages. Playing with the child lasted about 1 to 2 min. The experimenter then placed the toy and all accessories in the box and locked the padlock. While doing this the experimenter said, "We're going to play a game now. I'm going to lock the toy in the box. Here is a set of keys that you can use to open the lock (experimenter handed the child the keys and showed the child where the keys fit in the lock). When you unlock it, you can play with the toy." The experimenter then exited the room. After 3 min passed the experimenter knocked on the mirror to indicate to the mother that she could interact with her child as she normally would. After another 3 min passed the experimenter entered the room with the correct key. The experimenter said to the child, "I think I gave you the wrong keys. I have the right one." The experimenter then unlocked the box for the child, and this signaled the end of the task. (The child and mother were then left alone for 3 min to play with the toy, but this interaction as not included in the current study).

If a child cried continuously for 15 s or more during the beginning half of the task, the experimenter knocked early to signal the mother to interact with the child. If during the second half of the task the child cried for more than 15 s continuously, the experimenter entered the room early and ended the task.

Data Coding

All assessments were videotaped and recorded to DVD. The frustration tasks at each age consisted of two conditions. In both tasks, the mother-uninvolved condition was before the experimenter's knock (the first 3 min of the task) and the mother-involved condition was after

the knock (the last 3 min of the task). Child distress and child strategies were coded in each condition. Independent pairs of raters were trained to code child distress and child strategies. Coding systems for both child distress and child strategies were similar to those used in past studies.

Child distress. Child distress was coded using an interval-based coding system. Presence of whining, fussing, or crying in each condition was recorded. Vocalizations were the only measure used because children's faces could not always be seen clearly as they moved around the room. A copy of the coding manual is provided in Appendix A. Reliability was calculated for three raters on 15 tapes (25.4% of sample). The Kappa estimate averaged across all pairs was .84 (range .83-.85).

Child strategies. The coding system for child strategies was adapted from those used by Diener and Mangelsdorf (1999) and Calkins and Johnson (1998). Strategies that were coded included *interacting with mother*, *distraction*, *venting*, and *object orientation. Interacting with mother* was coded when the child had physical contact with or was in close proximity to the mother (within arm's reach), was vocalizing to the mother, and/or was looking at the mother. *Distraction* was coded when the child's attention was focused on something other than the object of frustration (i.e., goldfish crackers or animal hospital toy) and/or when the child covered eyes. *Venting* was coded when the child showed any physical aggression directed at an object or the mother (e.g., kicking, throwing, hitting). *Object orientation* was coded when the child touched or manipulated the container and/or when they looked at the container. Strategies were coded in 5 s intervals, and only one strategy per interval was recorded. In instances where two strategies occurred sequentially in the same interval, the one that occurred first was coded. Coding manuals for child strategies are provided in Appendices B and C. Each strategy was summed

across intervals to generate a frequency score for each strategy in the mother-involved and the mother-uninvolved conditions. These frequency scores were converted to proportion scores because one or both conditions may have been terminated early due to child distress; thus, the total number of coded intervals varied across children. Reliability was calculated for each child strategy code for 20 tapes (16.9% of the sample) using Cohen's kappa. The interrater reliability at 24 months based on 16 videos was .84 for interacting, .84 for object orientation, .72 for distraction, and .86 for venting. Kappa estimates for the strategy codes at 36 months based on 4 videos were .90 for interacting, .88 for object orientation, and .95 for distraction. Reliability for venting could not be calculated because it did not occur in these 4 videos.

RESULTS

Preliminary Analyses

For the child strategy data in the two frustration tasks, the frequency of each strategy (i.e., the number of intervals in which it was coded) was calculated separately by condition. The length of conditions was shorter for some participants because if children became too distressed (i.e., 15 s of steady crying) the condition was terminated. Therefore, frequency variables for the child strategies were divided by the total number of coded intervals to yield proportion scores. The distress data were also transformed into proportion scores by dividing the total number of intervals containing distress by the total number of intervals per condition. The resulting proportion scores, rather than the raw frequency data, were used in all analyses.

Descriptive statistics for the child strategy data and the child distress data at each age are reported in Tables 1 and 2. Preliminary analyses were conducted to examine relations between child strategies at each age, to examine relations between child distress and specific regulatory strategies at each age, and to examine the stability of child distress and child strategies over time.

These preliminary analyses are reported below. Because of the number of analyses, a Bonferroni correction was calculated to prevent alpha inflation. With the desired alpha set at .05, the adjusted significance level was .001 and findings are reported using this significance level.

Relations between 24 month strategies. Pearson zero-order correlations were calculated to examine the relations between child strategies at 24 months during the goldfish task. In the uninvolved condition, interacting with mother was negatively correlated with object orientation (r = -.53, p = .000) and distraction (r = -.88, p = .000). These findings indicate that the more children interacted with mothers at 24 months in the uninvolved condition, the less they focused on the object of frustration. Also, the more children interacted with mothers at 24 months in the uninvolved condition, the less they used distraction. In the uninvolved condition venting was not significantly related to object orientation (r = -.15, p = .27), interacting with mother (r = -.02, p = .88), or distraction (r = -.15, p = .25). Also, distraction and object orientation were not significantly correlated in the uninvolved condition at 24 months (r = .13, p = .33).

The findings were similar in the involved condition. Interacting with mother was negatively correlated with distraction (r = -.98, p = .000). The more children interacted with mothers at 24 months in the involved condition, the less they used distraction. In the involved condition venting was not related to object orientation (r = .07, p = .63), interacting with mother (r = -.20, p = .13), or distraction (r = .12, p = .42). Interacting with mother was not correlated with object orientation (r = -.38, p = .003). Also, object orientation was not related to distraction at 24 months in the involved condition (r = .21, p = .12).

Relations between 36 month strategies. Pearson zero-order correlations were calculated to examine the relations between child strategies at 36 months during the toy-in-box

task. In the uninvolved condition, interacting with mother was significantly negatively related to object orientation (r = -.74, p = .000). The more children interacted with their mothers at 36 months in the uninvolved condition, the less they engaged in object orientation. There was also a significant negative correlation between object orientation and distraction at 36 months in the uninvolved condition (r = -.42, p = .001), indicating that the more children engaged in object orientation at 36 months in the uninvolved condition, the less they engaged in distraction. Venting was not correlated with interacting (r = .20, p = .13), object orientation (r = -.12, p = .36), or distraction (r = -.13, p = .34). Interacting with mother was not related to distraction (r = -.30, p = .02).

In the involved condition interacting with mother was significantly negatively related to object orientation (r = -.91, p = .000) and distraction (r = -.43, p = .001). The more children interacted with their mothers at 36 months in the involved condition the less children engaged in object orientation. Also, the more children interacted with their mothers at 36 months in the involved condition the less children engaged in distraction. In the involved condition at 36 months venting was not correlated with interacting (r = -.08, p = .54), object orientation (r = -.05, p = .70), or distraction (r = .04, p = .74). Also, object orientation was not related to distraction (r = .04, p = .77).

Relations between distress and child strategies at 24 months. In order to investigate relations between distress and child strategies at 24 months, Pearson zero-order correlations were calculated. In the uninvolved condition distress was negatively correlated with object orientation (r = -.46, p = .000) and distraction (r = -.51, p = .000). Children that showed higher levels of distress at 24 months in the uninvolved condition showed lower levels of object orientation and distraction. Distress was positively correlated with interacting with mother (r = .55, p = .000)

and venting (r = .41, p = .000). Children showing higher levels of distress showed higher levels of interacting with mother and venting. In the involved condition at 24 months, there were no significant relations between distress and child strategies (see Table 3).

Relations between distress and child strategies at 36 months. Pearson zero-order correlations were calculated to examine the relations between distress and child strategies at 36 months. In the uninvolved condition distress was positively related to interacting with mother (r = .67, p = .000) and venting (r = .40, p = .000). Children with higher levels of distress at 36 months in the uninvolved condition were more likely to interact with their mothers and to engage in venting. Also, distress at 36 months in the uninvolved condition was negatively related to object orientation (r = -.48, p = .000). Higher levels of distress at 36 months in the uninvolved condition were associated with lower levels of object orientation at 36 months in the uninvolved condition. There was no significant relation between distress and distraction at 36 months in the uninvolved condition (r = -.23, p = .08). In the involved condition at 36 months, there were no significant relations between distress and child strategies (see Table 4).

Stability of distress across ages. In order to investigate the stability of distress across ages (24 and 36 months) Pearson zero-order correlations were calculated. In the uninvolved condition, distress at 24 months was positively correlated with distress at 36 months (r = .50, p = .000). Children who were more distressed at 24 months in the uninvolved condition were more likely to be distressed at 36 months in the uninvolved condition. Distress at 24 months in the involved condition was not significantly correlated with distress at 36 months in the involved condition (r = .12, p = .36).

Stability of child strategies across ages. Pearson zero-order correlations were calculated to investigate the stability of child strategies across ages (24 and 36 months). There

were no significant relations between child strategies at 24 months and child strategies at 36 months in the uninvolved or involved conditions (see Tables 5 and 6).

Predictive Analyses

Child distress as a function of age and condition. To examine whether child distress differed across ages and conditions as hypothesized, a repeated measures multivariate analysis of variance was conducted to examine the main effects of age and condition on distress. Age (24 and 36 months) and condition (uninvolved and involved) were within-subjects variables. Results indicated a significant main effect of condition, $F(1, 57) = 10.57$, $p = .002$, $\eta^2 = .16$. As expected, across ages children displayed significantly more distress in the uninvolved condition ($M = .26$, $SE = .03$) than in the involved condition ($M = .19$, $SE = .02$). Results also indicated a significant main effect of age, $F(1, 57) = 51.34$, $p = .00$, $\eta^2 = .47$. As hypothesized, across conditions there was significantly more distress at 24 months ($M = .35$, $SE = .04$) than at 36 months ($M = .10$, $SE = .02$). Contrary to expectations, there was no significant condition by age interaction for distress, $F(1, 57) = 2.62$, $p = .06$, $\eta^2 = .04$.

Child strategies as a function of age and condition. A repeated measures multivariate analysis of variance was conducted to examine the main effects of age, condition, and type of strategy on the frequency of child strategy use and to examine possible interactions between type of strategy, age, and condition. Age (24 and 36 months), condition (uninvolved and involved), and type of strategy (interacting, object orientation, distraction, venting) were within-subjects variables. Two-way interactions (age by condition, age by type of strategy, and condition by type of strategy) were included in the model as was the three-way interaction of age, condition, and type of strategy.

Main effects of condition, age, and type of strategy. Results indicated that there was no main effect of condition, $F(1, 57) = 1.42$, $p = .24$, $\eta^2 = .02$. Thus, there were no significant differences between the overall frequency of strategies used in the uninvolved ($M = .25$, $SE = .00$) and involved ($M = .25$, $SE = .00$) conditions. There was also no significant main effect of age, $F(1, 57) = 2.32$, $p = .13$, $\eta^2 = .04$, indicating that there were no significant differences in the overall frequency of strategies used at 24 months ($M = .25$, $SE = .00$) and 36 months ($M = .25$, $SE = .00$). There was, however, a significant main effect for type of strategy, $F(3, 171) = 519.25$, $p = .00$, $\eta^2 = .90$. Inspection of the means indicated that across conditions and ages, interacting with mother was used the most often ($M = .69$, $SE = .02$). The second most frequent strategy was object orientation ($M = .17$, $SE = .01$) followed by distraction ($M = .13$, $SE = .01$). Venting occurred the least frequently ($M = .01$, $SE = .00$). Post-hoc comparisons on the estimated marginal means with a Bonferroni correction indicated that interacting with mother occurred significantly more often than all other strategies. Object orientation and distraction both occurred significantly more than venting (all p's = .000). The main effect of type of strategy was qualified by significant two-way interactions (type of strategy by condition, type of strategy by age) as well as by a significant three-way interaction (type of strategy by condition by age). These interaction effects are discussed in the sections that follow.

Strategy by condition interaction. The multivariate test for the strategy by condition interaction was significant, Wilks' Lambda $F(3, 55) = 84.69$, $p < .001$, as was the within-subjects test, $F(3, 171) = 177.72$, $p = .00$, $\eta^2 = .78$ (see Figure 1). Confidence intervals for the estimated marginal means were examined to determine significant differences in the frequency of specific strategies in each condition. Across ages, there was significantly more interacting with mother

in the involved conditions (M = .88, SE = .01) than in the uninvolved conditions (M = .49, SE = .03). All other strategies occurred significantly more often in the uninvolved conditions. Specifically, object orientation occurred significantly more in the uninvolved conditions (M = .31, SE = .02) than in the involved conditions (M = .03, SE = .01), as did distraction (M = .18, SE = .02 and M = .09, SE = .01 respectively) and venting (M = .01, SE = .00 and M = .00, SE = .00 respectively). Confidence intervals are provided in Table 7.

Strategy by age interaction. The multivariate test for the strategy by age interaction was significant, Wilks' Lambda $F(3, 55) = 54.30$, $p < .001$, as was the within-subjects test, $F(3, 171) = 32.49$, $p = .00$, $\eta^2 = .36$ (see Figure 2). Confidence intervals for the estimated marginal means were examined to determine significant differences in the frequency of specific strategies at each age. Across conditions, there were no significant differences in interacting with mother at 24 and 36 months. There were, however, significant differences in the use of other strategies at each age. There was significantly less object orientation at 24 months (M = .06, SE = .01) than at 36 months (M = .28, SE = .02). There was significantly more distraction at 24 months (M = .19, SE = .02) than at 36 months (M = .08, SE = .01). Also, there was significantly more venting at 24 months (M = .02, SE = .00) than at 36 months (M = .002, SE = .00). Confidence intervals are provided in Table 8.

Strategy by age by condition interaction. The multivariate test for the strategy by age by condition interaction was significant, Wilks' Lambda $F(3, 55) = 57.58$, $p < .001$, as was the within-subjects test, $F(3, 171) = 60.97$, $p = .000$, $\eta^2 = .52$ (see Figure 3). In order to clarify the nature of this interaction, the frequency of each strategy was examined first across ages within conditions and then across conditions within ages as described in the sections that follow.

Confidence intervals for the estimated marginal means were examined to determine significant differences in the frequency of specific strategies by condition and by age. Estimated marginal means, standard errors, and confidence intervals are provided in Table 9.

Interacting with mother (age effects within conditions). Children interacted with mothers significantly more at 24 months than at 36 months in the uninvolved condition. In contrast, children interacted with mothers significantly more at 36 months than at 24 months in the involved condition.

Interacting with mother (condition effects within ages). There were also significant condition effects within ages for the strategy of interacting with mother. At 24 months interacting with mother occurred significantly more in the involved condition than in the uninvolved condition. The same pattern occurred at 36 months: Children interacted with mothers significantly more during the involved condition than during the uninvolved condition.

Object orientation (age effects within conditions). Children spent more time focused on the frustrating object (goldfish container or toy-in-box) at 36 months than at 24 months in the uninvolved condition. The frequency of object orientation at 24 and 36 months did not differ in the involved condition.

Object orientation (condition effects within ages). At 24 months, object orientation occurred significantly more in the uninvolved condition than in the involved condition. The same pattern occurred at 36 months: Children spent more time focused on the frustrating object during the uninvolved than during the involved condition.

Distraction (age effects within conditions). Children engaged in significantly more distraction at 24 months than at 36 months in the uninvolved condition. In the involved condition, however, the frequency of distraction did not vary at 24 and 36 months.

Distraction (condition effects within ages). At 24 months, the frequency of distraction did not differ in the uninvolved and involved conditions. At 36 months, however, distraction occurred significantly more in the uninvolved condition than in the involved condition.

Venting (age effects within conditions). Children showed more venting (i.e., aggression) at 24 months than at 36 months in the uninvolved condition. The frequency of venting at 24 and 36 months did not differ in the involved condition.

Venting (condition effects within ages). Venting occurred significantly more in the uninvolved condition than in the involved condition at 24 months. At 36 months, venting did not differ in the uninvolved and involved conditions.

DISCUSSION

The current study examined how children's distress and regulatory strategies during a frustrating task at 24 and 36 months were related to maternal involvement (versus uninvolvement) using a longitudinal design. It was hypothesized that there would be stability in children's distress and strategy use over time. The main hypotheses of the study concerned the effects of age and maternal involvement on children's distress and use of regulatory strategies. More specifically, it was hypothesized that as children get older, their behavior during a frustrating task would vary less as a function of maternal involvement. Thus, it was expected that age (24/36 months) and condition (maternal uninvolvement/involvement) would interact to predict children's distress and regulatory strategies. Although significant interactions between age and condition were not obtained, there were significant main effects of age and condition on children's distress. In addition, there were significant two-way interactions between type of regulatory strategy and both age and condition in predicting children's use of regulatory strategies. These two-way interactions were qualified by a three-way interaction between type of

strategy, condition, and age. The following sections review the findings of the current study and consider how these findings are related to past research and the hypotheses of the study.

Stability of Child Strategies over Time

The current study found no significant relations between child strategies at 24 months and child strategies at 36 months in either condition. Little past research has examined this exact question. Although it was hypothesized that there would be some stability in children's strategy use over time, the current findings seem to be consistent with some past research. In a longitudinal study of 18- and 24-month-olds, Calkins (2002) examined children's distress to frustration, aggression/venting, and defiance as types of "aversive" behavior and how these behaviors were related to maternal behavior over time. Venting/aggression was not stable from 18 months to 24 months of age, just as in the current study it was not stable from 24 to 36 months of age. A cross-sectional study conducted by Stansbury and Sigman (2000) examined 3- and 4-year-olds in two tasks designed to elicit frustration and children's behavior was coded. Results showed that overall, older children (4-year-olds) used fewer strategies than did younger children (3-year-olds). It is possible that older children have had more experience with different regulatory strategies and tend to rely on certain strategies that they have found most effective in the past. This may partially explain why no significant relations were found in the current study between strategies used at 24 months and 36 months of age. Another possible reason that strategies may not have been significantly related across ages in the current study is that the two frustration tasks differed somewhat in their nature. The task at 36 months of age gave children the opportunity to problem solve because they were told that one of the keys would open the lock on the box. In contrast, at 24 months children were simply told that they could have the snack in

a few minutes. This difference may partially explain why there was more object orientation seen at 36 months and more distraction seen at 24 months.

Stability of Child Distress over Time

It was hypothesized that child distress would also be stable over time and results were partially consistent with this hypothesis. In the uninvolved condition, distress at 24 months was significantly positively correlated with distress at 36 months. Children who were more distressed at 24 months when their mothers were not involved were more likely to be distressed at 36 months when their mothers were not involved. Distress at 24 months in the involved condition was not significantly correlated with distress at 36 months in the involved condition. The significant relations found when mothers were not involved are consistent with past research. Calkins (2002) found significant longitudinal stability of distress in two frustration tasks with children ages 18 and 24 months. Past research has found that when parents are not involved children tend to show higher levels of negative affect than when parents are involved (Diener & Mangelsdorf, 1999; Grolnick et al., 1996).

Relations between Distress and Child Strategies at 24 and 36 Months

Results of the current study indicated that in the uninvolved condition at 24 months distress was significantly negatively correlated with distraction and object orientation. When mothers were not involved at 24 months, children who demonstrated higher levels of distress tended to show lower levels of distraction and object orientation. In contrast, distress was positively correlated with interacting with mother and with venting in the uninvolved condition. Children who showed higher levels of distress were more likely to interact with their mothers and to engage in venting. Relations between child strategies and child distress were similar at 36 months. When mothers were not involved at 36 months child distress was significantly

negatively related to object orientation. Children who showed high levels of distress tended to show low levels of object orientation. In addition, at 36 months in the uninvolved condition distress was significantly positively related to interacting with mother and venting. Children who showed high levels of distress when mothers were not involved also showed high levels of interacting with mother and venting. In the involved conditions at 24 and 36 months, there were no significant relations between distress and children's strategies. One possible explanation is that in the involved condition, mothers' behavior had a greater impact on children's distress than did children's own strategy use.

The results for the uninvolved condition are generally consistent with past research on associations between children's regulatory strategies and their distress. Calkins and Johnson (1998) found that children who showed greater distress during frustration tasks were less likely to distract themselves with other objects. Also, Grolnick, Bridges, and Connell (1996) found that distress was negatively related to children's active engagement with substitute objects (i.e., distraction). In the current study, children's use of distraction was negatively related to distress only at 24 months but not at 36 months. It is not clear why the association was not significant at 36 months. However, it is possible that as children get older other strategies (such as active problem-solving) are more likely to be associated with less distress. The children in Calkins and Johnson's study and in Grolnick et al.'s study were 18 and 24 months, respectively.

There are mixed findings from past research on the relationship between distress and object orientation. The current study found that when mothers were not involved at 24 and 36 months, children who demonstrated high levels of distress tended to show low levels of object orientation. These findings of the current study are consistent with those of Calkins and Johnson (1998), who found that children who showed greater distress during frustration tasks were less

likely to try to overcome the barriers in their way (constructive coping). Although the tasks used in this study were somewhat different from those of the current study, object orientation in the current study did include behaviors in which children attempted to gain access to the object of frustration (i.e., open the containers to get the goldfish or the toy). It is possible that working toward gaining the object of frustration may serve as a sort of distraction for children and lead to less distress. Grolnick et al. (1996), however, found that distress was positively related to children's focus on objects during a delay task; children who focused on these objects of frustration showed more distress. One possible reason for different findings across studies involves differences in the nature of the frustration tasks used. In the Grolnick et al. (1996) study, two frustration tasks involved taking objects (food and a gift) out of the child's reach. Therefore, when a child was recorded as focusing on the object they were most likely just looking at the object they desired and had no way of working toward attaining the object. In the current study, when children were coded as engaging in object orientation, they could have just been looking at or touching the object of frustration, but they could also have been actively working toward gaining access. A situation in which children do not have a way to work toward gaining the object they desire may lead to greater distress overall.

Results from the current study demonstrated that distress was significantly positively correlated with interacting with mothers and venting. Children who showed high levels of distress at 24 and 36 months when mothers were not involved also showed high levels of venting. This finding is consistent with the findings of Calkins and Johnson (1998), who found that toddlers who showed greater distress were more likely to bang, kick, hit, or throw objects (i.e., venting).

The current study also demonstrated that children who showed high levels of distress at 24 months when mothers were not involved also showed high levels of interacting with mothers. It is likely that most young children are used to their mothers interacting with them when requested most of the time. Thus, it is likely that children experienced distress when their mothers ignored them or refused to help them open the container. Anecdotally, many children sought help from their parents in opening the container and appeared to become increasingly frustrated when mothers did not assist them. Calkins and Johnson (1998) found that toddlers who showed greater distress were less likely to attend to or to interact with their mothers. Some of the frustration tasks used in their study, however, permitted greater maternal responsiveness so it is possible that children were able to derive some assistance in regulating their distress if they did seek out their mothers.

It is important to note that the direction of effects cannot be determined from the correlations between distress and children's regulatory strategies. It is possible that the use of certain strategies may in fact lead to increases or decreases in children's distress. But it is also possible that children's level of distress influences their choice of strategies. For example, children who are more distressed initially may be more likely to seek out mothers or to engage in venting, while children who are less distressed focus on the frustrating object or engage in distraction.

Effects of Age and Maternal Involvement on Children's Distress

As hypothesized, there were significant main effects of condition and age on children's distress during the frustration tasks. As expected, results of the current study indicated that at both 24 and 36 months, children displayed significantly more distress in the uninvolved condition than in the involved condition. This finding is consistent with past research (Diener &

Mangelsdorf, 1999; Grolnick et al., 1996). Young children still rely greatly on parents for assistance in emotion regulation. Therefore, when parents are unavailable for assistance children may experience a great deal of distress.

As hypothesized, results of the current study also indicated a significant main effect of age on children's distress during the frustrating tasks. As expected, there was significantly more distress at 24 months than at 36 months. Theories of emotion regulation hypothesize that children become less dependent on external support in regulating their emotions as they grow older (Calkins & Hill, 2007; Kopp, 1989). This would explain some of the differences seen in distress in children from 24 to 36 months. Also, over time children become better at regulating their emotions and therefore less distress may be seen. Another possible reason for differences in distress across ages may involve the nature of the frustration tasks at each age. It is possible that the goldfish task may simply evoke more distress than the toy in box task.

Effects of Type of Strategy, Age, and Condition on Children's Use of Regulatory Strategies

Results of the current study demonstrated a significant main effect of type of strategy. Across conditions and ages, interacting with mother occurred significantly more often than all other regulatory strategies. This finding is consistent with past research (Grolnick et al., 1998) demonstrating that toddler-aged children are still reliant on parents to guide emotion regulation. In the current study, children turned to parents for assistance in the emotion regulation process. With respect to other regulatory strategies, object orientation and distraction both occurred significantly more frequently than venting. The low frequency of venting is consistent with past research (Calkins, 2002; Calkins & Johnson, 1998). Grolnick et al. (1996) found that the most frequently used strategy for 24-month-olds was active engagement with a substitute object (i.e., distraction). But Grolnick et al. coded engagement with a substitute object when children

engaged in active play with a toy or with the parent/experimenter. In the current study, any interactions with a parent were coded as interacting with mother. Thus, their measure of distraction included interacting with the parent.

The main effect of type of strategy was qualified by a significant strategy by condition interaction. There was significantly more interacting with mother in the involved condition than in the uninvolved condition across ages. In contrast, object orientation, distraction, and venting all occurred significantly more in the uninvolved condition than in the involved condition across ages. There was also a significant strategy by age interaction. There was significantly less object orientation at 24 months than at 36 months. There was significantly more distraction and venting at 24 months than at 36 months. However, the main effect of type of strategy and the two-way interactions were qualified by a three-way interaction between strategy, age, and condition. The findings related to the three-way interaction are considered below in light of the study's hypotheses and past research.

Interacting with mother (age effects within conditions). Results of the current study indicated that interacting with mother occurred significantly more at 24 months in the uninvolved condition than at 36 months in the uninvolved condition and significantly more at 36 months in the involved condition than at 24 months in the involved condition. These results are somewhat consistent with the study's hypotheses. It was hypothesized that interacting with mother would occur more at 24 months than at 36 months because past research has shown that younger children rely more on external support such as parents for emotion regulation (Calkins & Hill, 2007; Kopp, 1989). In the current study, however, this was true only for the condition in which mothers were not involved. One reason there may have been more interacting at 36

months than at 24 months when mothers were involved is because parents and children frequently worked together to try to open the container and gain access to the toy in the box.

Interacting with mother (condition effects within ages). In the current study, as predicted, at both 24 and 36 months interacting with mother occurred significantly more in the involved condition. This was consistent with the study's hypotheses because when mothers were involved they were able to interact with the children in a normal manner and work together to help children regulate emotions. This finding was also consistent with past research by Diener and Mangelsdorf (1999), who found that 18- and 24-month-olds showed more attempts to engage mothers and more social referencing (i.e., child looks at mother's face) when mothers were involved in a frustration task.

Object orientation (age effects within conditions). In the current study, when collapsed across condition, there was a significant age effect for the uninvolved condition. Consistent with hypotheses, object orientation occurred significantly more at 36 months in the uninvolved condition than at 24 months in the uninvolved condition. One reason for this is the normative development of emotion regulation. It was expected that older children would use more problem-solving skills and work toward opening the container to attain the object of frustration (Calkins & Hill, 2007; Kopp, 1989). However, the task at 36 months may also have occasioned more problem solving (i.e. trying the different keys) than the task at 24 months.

In the current study, however, there was not a significant age effect on object orientation in the involved condition. There was not a significant difference between object orientation at 24 months when mothers were involved and object orientation at 36 months when mothers were involved. One reason for this finding may be that when mothers are available, children at both 24 and 36 months still rely quite a bit on them for help with regulation.

Object orientation (condition effects within ages). In the current study, at 24 months and 36 months object orientation occurred significantly more in the condition in which mothers were not available than in the condition in which mothers were available. This is consistent with the study's hypotheses and somewhat consistent with past research. Diener and Mangelsdorf (1999) found that children showed less problem solving when mothers were involved. However, it was found that children engaged in more playing with the object of frustration when mothers were involved. In the current study, the strategy of object orientation included instances in which children were engaging in playing with the object and instances of problem solving. Because these two behaviors were not differentiated in the current study, it is difficult to directly compare results.

Distraction (age effects within conditions). In the current study distraction occurred significantly more at 24 months in the uninvolved condition than at 36 months in the uninvolved condition. This result was not consistent with the study's hypotheses, which suggested that distraction would occur more at 36 months. Past research by Grolnick et al. (1996) found distraction to be the most commonly used strategy by 24-month-olds, so according to past research this is a strategy that is prevalent in many toddlers of this age. One reason that more distraction may have been seen at 24 months when mothers were not involved in the current study is that children were told that they could have their snack in a few minutes, whereas at 36 months they had something to work toward and could try to open the box with the toy in it. In the current study when mothers were involved, there was not a significant age effect. There was not a significant difference in the amount of distraction seen at 24 or 36 months. Children may need to rely on distraction less when mothers are available to interact.

Distraction (condition effects within ages). It was hypothesized that there would be more distraction in the conditions in which mothers were not available to help children with emotion regulation. In the current study, results were consistent with this hypothesis at 36 months. At 36 months distraction occurred significantly more in the uninvolved condition than in the involved condition. Conversely, there was not a significant condition effect at 24 months. These results are only partially consistent with past research. Grolnick et al. (1998) found that active engagement with a substitute object occurred most frequently overall at 24 months, but it was used the most when an adult was available and participatory. Diener and Mangelsdorf (1999) did not find a significant difference between children's use of distraction when mothers were uninvolved and involved.

Venting (age effects within conditions). Venting occurred significantly more at 24 months when mothers were not involved than at 36 months when mothers were not involved. This finding was consistent with the study's hypotheses. There was not a significant difference in venting at 24 months and 36 months when mothers were involved. It is possible that a difference was not seen when mothers were involved because venting occurred very rarely when mothers were available and participatory with children.

Venting (condition effects within ages). In the current study, there was a significant condition effect at 24 months. Venting occurred significantly more when mothers were not involved at 24 months than when mothers were involved at 24 months. There was not a significant condition effect at 36 months for venting. These results are consistent with the study's hypotheses. It was predicted that there would be a greater difference in children's behavior during the uninvolved and involved conditions at 24 months relative to 36 months. For venting, maternal involvement had a greater effect on the behavior of 24-month-olds than on the

behavior of 36-month-olds. This finding is also consistent with past research (Calkins & Hill, 2007; Kopp, 1989) that has demonstrated that as children grow older, they become less reliant on outside sources (i.e., parents) to regulate their emotions.

General Limitations

The current study had a number of limitations in addition to those discussed in previous sections. The sample was homogeneous with respect to ethnicity, marital status, and education, which limited external validity. With respect to data collection, the frustration tasks at both ages were filmed through a one-way mirror. Mothers were aware that they were being filmed and therefore participant reactivity was a risk. It is possible that because mothers knew they were being watched, they were less likely to engage in negative behaviors.

Another limitation pertaining to the frustration tasks is that the goldfish task at 24 months differed from the toy in box task at 36 months, particularly with respect to what children were told about the possibility of accessing the frustrating object. It is thus possible that the two tasks evoked different levels of distress and/or different regulatory strategies in children. The objects of frustration in the two tasks also differed. It is plausible that the edible goldfish could have been more rewarding and worth working for than the animal hospital toy, or vice versa. Another limitation concerned the coding of children's regulatory strategies. Object orientation included relatively passive behaviors (i.e., looking at or touching the object of frustration) as well as active attempts to open the container. These behaviors could reflect different strategies for emotion regulation and have been distinguished in other research. Unfortunately, in the current study coders were not able to distinguish these behaviors reliably.

Another limitation of the current study is that it did not measure specific maternal behaviors. Although mothers were given standardized instructions about how to behave during

the uninvolved condition, there was still variability in the extent to which mothers interacted with their children and this variability was not accounted for in the current study. Also, during the involved condition there was a wide array of potential behaviors in which mothers could engage. As shown by Grolnick et al. (1998), the strategies that mothers use in response to their toddlers' emotional arousal are related to children's independent attempts at emotion regulation. Mothers' involvement and behavior during frustrating tasks also is related to children's negative affect (Diener & Mangelsdorf, 1999; Grolnick et al., 1996).

Despite its limitations, the current study does add to the existing literature by providing additional data on factors that are related to children's distress and their use of regulatory strategies at 24 and 36 months. The longitudinal design of the study also made it possible to examine stability in children's distress and strategy use over time. Although there was no stability in children's strategy use from 24 to 36 months, children's distress during a frustrating task was stable when mothers were uninvolved in the task. Future research could extend the longitudinal design and include ages past 36 months.

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Table 1

Descriptive Statistics for Child Strategies and Distress at 24 Months in the Uninvolved and Involved Conditions, N = 59

	Min	Max	*M*	*SD*
Uninvolved				
Interacting	.13	1.0	.63	.26
Object	.00	.50	.10	.12
Distraction	.00	.81	.23	.23
Venting	.00	.26	.03	.05
Distress	.00	1.0	.41	.35
Involved				
Interacting	.31	1.0	.83	.18
Object	.00	.12	.02	.03
Distraction	.00	.62	.15	.17
Venting	.00	.09	.00	.02
Distress	.00	1.0	.30	.29

Note. Means and standard deviations for child strategies and distress are based on proportion scores.

Table 2

Descriptive Statistics for Child Strategies and Distress at 36 Months in the Uninvolved and Involved Conditions, N = 59

	Min	Max	*M*	*SD*
Uninvolved				
Interacting	.00	.91	.36	.25
Object	.00	1.0	.51	.27
Distraction	.00	.95	.13	.19
Venting	.00	.03	.00	.01
Distress	.00	.88	.13	.19
Involved				
Interacting	.58	1.0	.93	.09
Object	.00	.42	.05	.80
Distraction	.00	.17	.02	.04
Venting	.00	.06	.00	.01
Distress	.00	.69	.08	.15

Note. Means and standard deviations for child strategies and distress are based on proportion scores.

Table 3

Zero-order Correlations for Child Strategies and Distress at 24 Months in the Involved Condition, N = 59

	Interacting	Object	Distraction	Venting
Distress	.09	-.13	-.06	-.08

Table 4

Zero-order Correlations for Child Strategies and Distress at 36 Months in the Involved Condition, N = 59

	Interacting	Object	Distraction	Venting
Distress	.04	-.09	.05	.28

Table 5

Zero-order Correlations for Child Strategies at 24 Months in the Uninvolved Condition and Child Strategies at 36 Months in the Uninvolved Condition, N = 59

	Object (36)	Interacting (36)	Distraction (36)	Venting (36)
Object (24)	**.19**	-.04	-.22	-.09
Interacting (24)	-.22	**.09**	.19	-.02
Distraction (24)	.25	-.13	**-.18**	.07
Venting (24)	-.31	.13	.26	**.01**

Table 6

Zero-order Correlations for Child Strategies at 24 Months in the Involved Condition and Child Strategies at 36 Months in the Involved Condition, N = 59

	Object (36)	Interacting (36)	Distraction (36)	Venting (36)
Object (24)	**.01**	-.05	.12	-.11
Interacting (24)	-.22	**.18**	.04	-.02
Distraction (24)	.24	-.19	**-.08**	.05
Venting (24)	-.09	.08	.00	**-.06**

Table 7

Means, Standard Errors, and 95% Confidence Intervals for Each Child Strategy in the Uninvolved and Involved Conditions, N = 59

Strategy	*M*	*SE*	95% Confidence Intervals
Interacting (U)	.49	.03	.44, .54
Interacting (I)	.88	.01	.85, .91
Object (U)	.31	.02	.27, .35
Object (I)	.03	.01	.02, .04
Distraction (U)	.18	.02	.15, .22
Distraction (I)	.09	.01	.06, .11
Venting (U)	.01	.00	.01, .02
Venting (I)	.00	.00	.00, .01

Table 8

Means, Standard Errors, and 95% Confidence Intervals for Each Child Strategy at 24 Months and 36 Months, N = 59

Strategy	*M*	*SE*	95% Confidence Intervals
Interacting (24)	.73	.02	.68, .78
Interacting (36)	.65	.02	.61, .68
Object (24)	.06	.01	.04, .08
Object (36)	.28	.02	.24, .32
Distraction (24)	.19	.02	.15, .24
Distraction (36)	.08	.01	.05, .10
Venting (24)	.02	.00	.01, .02
Venting (36)	.00	.00	.00, .003

Table 9

Means, Standard Errors, and 95% Confidence Intervals for Each Child Strategy across Ages (24 Months and 36 Months) and Conditions (Uninvolved and Involved), N = 59

	24 Months		36 Months	
Strategy	Uninvolved	Involved	Uninvolved	Involved
Interaction	.63 (.04)	.83 (.02)	.36 (.03)	.93 (.01)
	[.56, .70]	[.29, .42]	[.29, .42]	[.91, .96]
Object	.11 (.02)	.02 (.00)	.51 (.04)	.05 (.01)
	[.07, .14]	[.01, .03]	[.44, .58]	[.02, .07]
Distraction	.24 (.03)	.15 (.02)	.13 (.03)	.02 (.01)
	[.18, .30]	[.10, .19]	[.08, .18]	[.01, .03]
Venting	.03 (.01)	.00 (.00)	.00 (.00)	.00 (.00)
	[.01, .04]	[.00, .01]	[.00, .002]	[.00, .01]

Note. The means are listed first followed by the standard errors in parentheses and 95% confidence intervals on the second line.

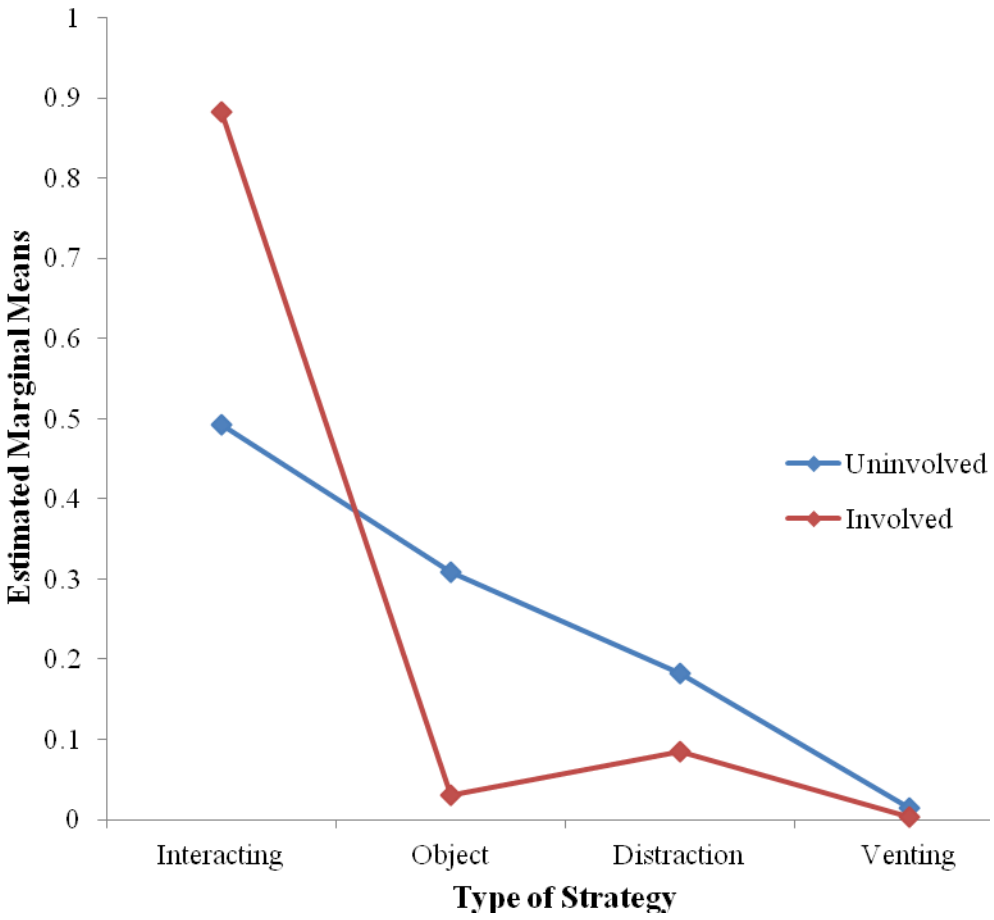


Figure 1. Differences in frequency of specific strategies as a function of condition (uninvolved and involved).

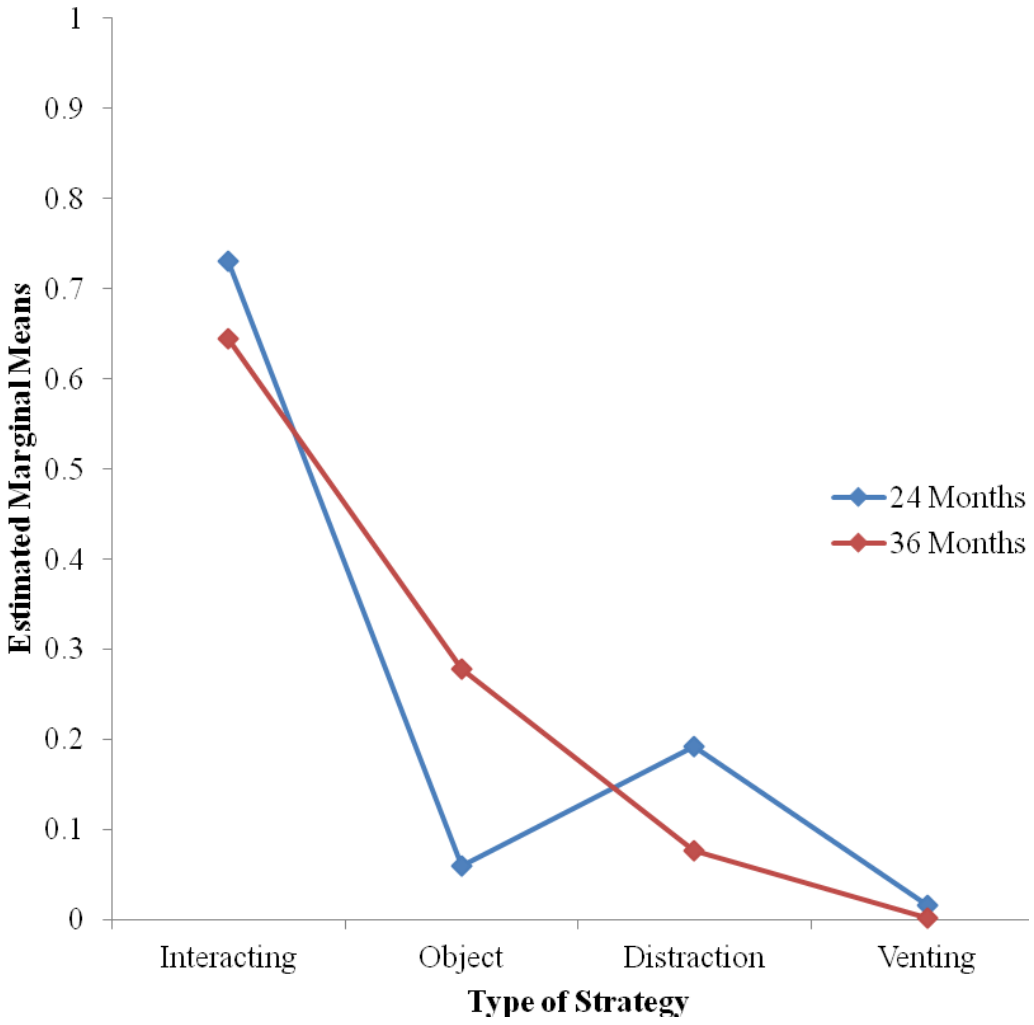


Figure 2. Differences in frequency of specific strategies as a function of age (24 and 36 months).

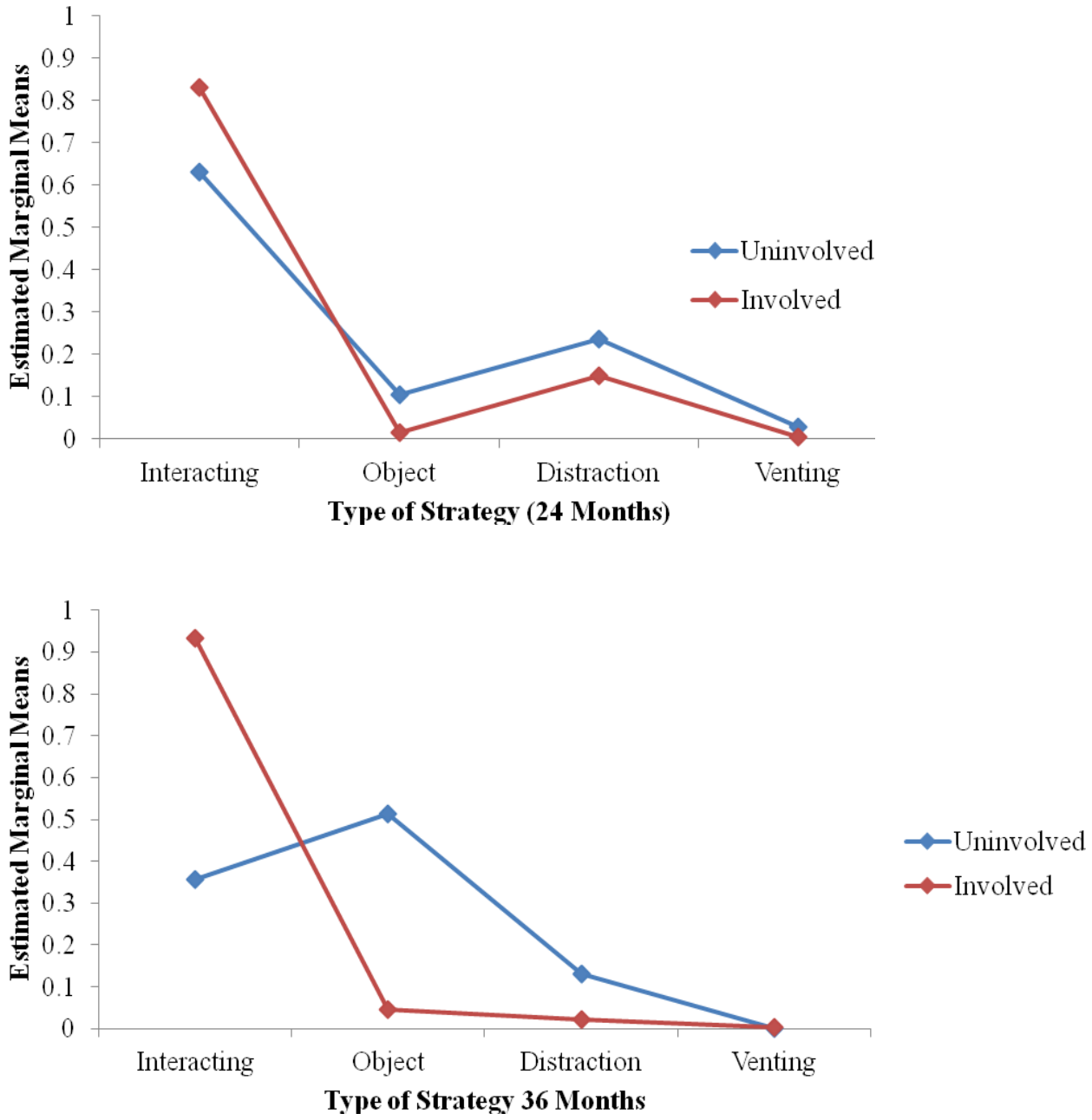


Figure 3. Differences in frequency of specific strategies as a function of condition (uninvolved and involved) and age (24 months and 36 months).

Appendix A

Coding Manual: Negative Affect

The task at each age generally lasts 6 minutes and is divided into two parts of equal length (mother-uninvolved and mother-involved). The parts are separated by a knock on the one-way mirror.

Use the coding sheet to determine the start time for the first interval. For each 5-second interval, place a check mark if the child shows any negative affect during the interval (e.g., whining, fussing, crying, angry vocalizations); see guidelines below. Negative affect includes anger.

If there is any negative affect, even if it occurs during part of the first second of an interval, count it; if the negative affect ends as the last second of one interval changes to the first second of the next interval, don't count it in the second interval. If there is no negative affect simply leave the interval blank.

When the knock occurs, check the time recorded at the top of the coding sheet and make sure that it is accurate; if there is a discrepancy, record the correct knock time in the space at the top of the coding sheet and cross out the incorrect time; also write KNOCK in the appropriate interval on the coding sheet and cross out KNOCK in the incorrect interval. Coding ends three minutes after the knock (or, if the task ends early, when the experimenter can first be seen or heard by the mother or child); the coding sheet will typically have a few extra intervals on it that should not be coded because they are more than 3 minutes after the knock time. The end time will typically occur in the middle of an interval; only code that interval if there are at least three full seconds in it before the end time occurs; otherwise the previous interval should be the last interval coded. Make sure that the end time recorded at the top of the coding sheet is correct; if you notice any discrepancy, record it on the coding sheet in the space for the end time and cross out the incorrect time.

If there is anything unusual about the procedure (e.g., stopwatch or other objects left in the playroom, experimenter clarifying instructions for mother during the procedure, other unusual things about the experimenter's, the child's, or the mother's behavior), make a note of it on the coding sheet.

Guidelines for Coding Negative Affect:

Negative affect is coded based on the child's vocalizations, but if facial expressions (negative or neutral/positive) help to clarify an ambiguous vocalization they may be used. Do

not use body movements or other behaviors (e.g., stomping/pounding fists, throwing object, hitting mother) to infer negative affect.

It can be difficult to agree on whether a child's vocalizations are "whiny". Whining includes a noticeable change in pitch or fluctuations in the child's pitch sometimes accompanied by the lengthening of syllables or words (e.g., "Noooooo . . ."). Even quiet whining should be counted.

If child says "no", this should not count as negative affect unless the child's tone is whiny, fussy, etc. Sounds that reflect effort (e.g., grunting, loud breathing) or are ambiguous should not be counted as negative affect. A vocalization that is simply loud should not be counted as negative affect.

Even if negative affect appears to be unrelated to the task, it should be coded.

Appendix B

Child Strategies: 24 Months

1. **Interacting with Mother:** Child is in close proximity to mother/ mother's chair (at least within the child's arm length) [*Proximity always applies except for in clear cases of distraction(i.e. engaged with other objects and not involving mom)]*; child is making verbalizations towards mother (e.g., "Look!", "Open") [*Child does not have to be looking at mom (may be looking at object); do not have to understand child, but using words counts as verbalizations (i.e. sounds like "Ahh," etc. do not count; this code also applies if child is off camera)]*; child is in physical contact (e.g. climbing on lap, touching mom/ mom's chair) with mother [*If child is engaged with any object that is on mom's lap, code here; child touching mom/mom's chair or being on mom's lap trumps all other behaviors and is coded here*]; child is looking at mother (i.e. visual gaze is focused on mother); mother and child are involved in a mutual game (e.g. tickling) (*even if child is looking away from mother). If child is actively trying to open container, but looking at mom, code as interacting with mother. If mom and child are engaged in a joint activity (e.g. helping child get Kleenex) code here.* Singing is also included in this category. If verbalizations occur during any part of a second, count as a full second.

2. **Distraction/ Other Focus:** Child is looking and touching an object other than the object of frustration (e.g. mirror, Kleenex, magazine, gate, chair, clothing, body parts, etc.). Child is looking anywhere other than at the object of frustration (and may be passively holding container). *This includes when the child is searching for the container, and when child is closing/covering eyes. This also includes when child is blowing nose for the majority of interval.*

3. **Venting:** Directing physical aggression toward the object of frustration, the mother or other objects in the room (e.g. hitting, kicking, throwing, shoving object/mom, forcefully grabbing, etc.). If child stomps feet, or pounds fists, this does not count as venting. If child's affect is clearly positive (not neutral or negative) do not code here. *Instances of venting trump all other codes.*

4. **Object Orientation:** Child is looking at container and/or actively manipulating container (e.g. trying to open container). *Passive holding of container is not included in this category. (If child is only looking at container and is talking to mom, code as* ***interacting with mother).*** [*If child is using the object (container) as a source of distraction, this counts as object orientation*].

5. **No Strategy:** Child is crying with such intensity that visual attention cannot be discerned and/or face is down against a surface (e.g. table, floor). *Only code this when nothing else occurs (no matter duration).*

Notes:

- End time is 3 minutes after knock time. (When task ends early: If there is at least 3s in interval before child sees/hears experimenter, that interval should be coded).
- If 2 strategies occur for equal amounts of time, code the first strategy that occurs.
- If there is doubt whether child is focusing on the object of frustration or something else, do not assume that they are looking at the object.
- If proximity is unclear, do not assume child is within proximity.
- If mom physically intervenes to move child (including picking up child to put on lap) for the majority of an interval, do not code the interval.
- If a second is split between 2 codes, hit pause as soon as child's orientation changes within 3rd second of interval, and use this code.
- If child is not on camera for at least 3 full seconds, do not code interval (unless child is talking).
- If child is not in proximity to mom and back is to camera for majority of interval, do not code. (This applies only when cannot clearly tell orientation of head/direction child is looking).
- If child quickly alternates between 2 or more behaviors within one interval and predominance is impossible to determine, code the 1st behavior to occur.
- If child is off camera and the child makes any vocalizations (no matter duration) code as interacting.

Appendix C

Child Strategies: 36 Months

1. <u>Interacting with Mother:</u> Child is in close proximity to mother/ mother's chair (at least within the child's arm length) [*Proximity always applies except for in clear cases of distraction(i.e. engaged with other objects and not involving mom)]*; child is making verbalizations towards mother (e.g., "Look!", "Open") [*Child does not have to be looking at mom (may be looking at object); do not have to understand child, but using words counts as verbalizations (i.e. sounds like "Ahh," etc. do not count; this code also applies if child is off camera)]*; child is in physical contact (e.g. climbing on lap, touching mom/ mom's chair) with mother [*If child is engaged with any object that is on mom's lap, code here; child touching mom/mom's chair or being on mom's lap trumps all other behaviors and is coded here*]; child is looking at mother (code here even if looking at/ trying to open container) mother and child are involved in a mutual game (e.g. tickling) (*even if child is looking away from mother). If child is actively trying to open container, but looking at mom, code as interacting with mother. If mom and child are engaged in a joint activity (e.g. helping child get Kleenex) code here.* Singing is also included in this category. If verbalizations occur during any part of a second, count as a full second. ***If child is clearly talking to the experimenter, mark in this category and indicate with an "E."*

2. <u>Distraction/ Other Focus:</u> Child is looking and touching an object other than the object of frustration (e.g. mirror, Kleenex, magazine, gate, chair, clothing, body parts, etc.). Child is looking anywhere other than at the object of frustration (and may be passively holding container). *This includes when the child is searching for the container, and when child is closing/covering eyes. This also includes when child is blowing nose for the majority of interval.*

3. <u>Venting:</u> Directing physical aggression toward the object of frustration, the mother or other objects in the room (e.g. hitting, kicking, throwing, shoving object/mom, forcefully grabbing, etc.). If child stomps feet, or pounds fists, this does not count as venting. If child's affect is clearly positive (not neutral or negative) do not code here. *Instances of venting trump all other codes.*

4. <u>Object Orientation:</u> Child is looking at container and/or actively manipulating container (e.g. trying to unlock container). *Passive holding of container is not included in this category. (If child is only looking at container and is talking to mom, code as* ***interacting with mother).*** [*If child is using the object (container) as a source of distraction, this counts as object orientation*].

5. <u>No Strategy:</u> Child is crying with such intensity that visual attention cannot be discerned and/or face is down against a surface (e.g. table, floor). *Only code this when nothing else occurs (no matter duration).*

<u>Notes:</u>

- End time is 3 minutes after knock time. (When task ends early: If there is at least 3s in interval before child sees/hears experimenter, that interval should be coded).
- If 2 strategies occur for equal amounts of time, code the first strategy that occurs.
- If there is doubt whether child is focusing on the object of frustration or something else, do not assume that they are looking at the object.
- If proximity is unclear, do not assume child is within proximity.
- If mom physically intervenes to move child (including picking up child to put on lap) for the majority of an interval, do not code the interval.
- If a second is split between 2 codes, hit pause as soon as child's orientation changes within 3rd second of interval, and use this code.
- If child is not on camera for at least 3 full seconds, do not code interval (unless child is talking).
- If child is not in proximity to mom and back is to camera for majority of interval, do not code. (This applies only when cannot clearly tell orientation of head/direction child is looking).
- If child quickly alternates between 2 or more behaviors within one interval and predominance is impossible to determine, code the 1st behavior to occur.
- If child is off camera and the child makes any vocalizations to mother (no matter duration) code as interacting. If talking to experimenter, indicate with an "E."
- If child is in proximity to mom, only code *object orientation* if there is NO interacting in the interval, and the child is not responding to suggestions/directions from mom.
- If child is not in proximity to the box and is looking at the ring of keys, code as *Distraction.*
- If child is looking at/ talking to mom while trying to open the container and/or looking at the container, code as *Interacting*.