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TODDLERS' DEVELOPING ABILITY TO REGULATE NEGATIVE EMOTION THROUGH  
THEIR MOTHERS' USE OF STRUCTURING

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## ABSTRACT

The development of emotion regulation is a subject that has received increasing attention in the research literature in recent decades, but gaps in research, particularly within the toddler population, still exist. Furthermore, while the importance of parenting for a child's developmental outcome is often emphasized, little is known about how parents directly contribute to their child's development of emotion regulation. The present study examined the degree to which a mother's attempts to structure her child's self-regulation over a four minute period contributes to her child's emotion regulation in a latter four minute period. To conduct this examination, 120 mothers and their 36-month-old toddlers were observed in a laboratory setting during an eight minute "wait" task designed to elicit frustration in the child. Because child behavior should predict child behavior, we predicted that child emotion and behavioral organization in the first half of the task would predict child emotion and behavioral organization in the second half. Once the stability of child behavior was accounted for, we tested the prediction that the frequency with which mothers engaged in structuring of child self-regulation in the first half of the task would account for better child regulation in the second half. In addition, we examined whether quality of structuring in the first half of the task accounted for child outcomes in the second half of the task in addition to frequency. Results did not support the predictions for maternal structuring. Implications for further research on this topic based on this preliminary investigation are discussed.

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## INTRODUCTION

Developing the ability to regulate negative emotion is an important task of early childhood and a domain of development in which the parents are thought to play an essential role (Kopp, 1989). The ability to regulate emotion develops throughout the life span, but one important step in that developmental pathway appears to occur between 24 and 36 months of age. First suggested by Kopp (1982), young children should first show evidence of self-control in the third year of life, as evidenced by complying with caregiver requests and monitor behavior even if the caregiver is not present. For instance, children can be considered to have engaged in self-control if they cleaned up their toys when their mother instructed them to even after she left the room. Self-control at this age also involves a limited capacity to delay and wait for something one wants. For example, if children were unexpectedly told to play when they actually preferred to eat a snack, the children who waited would be regarded as showing self-control. In early childhood, most children find such waiting difficult and often resort to whining or crying. Kopp (1982) distinguished self-regulation from self-control in early childhood. Self-regulation, she contended, is a more mature version of self-control that emerges around three years of age when children gain the ability to *adapt* to a changing environment. In this phase of development, children enduring a wait should begin to initiate behaviors that help them adapt to the wait, e.g. finding something to occupy themselves, such as making up a game or activity, instead of becoming upset. This strategy, usually referred to as distraction, involves the ability to initiate a shift of attention away from a desired object or activity and to become focused on an acceptable alternative activity that sustains tolerating the wait.

An important component of self-regulation is the ability to regulate emotion, particularly negative emotion, e.g., the frustration of having to wait for something you want or not being able

to do what you want to do. The concept of emotion regulation is important to child development research because of its role in both healthy functioning and psychopathology (Cole, Martin, & Dennis, 2004). Emotion regulation has been studied in infants (e.g., Grolnick, Bridges, & Connell, 1996), children and adolescents (e.g., Kobak, Cole, Ferenz- Gillies, & Fleming, 1993), and adults (e.g., Carstensen & Charles, 1998).

As noted, a particularly important period for its development is early childhood, which is seen as a foundational period in the lifelong development of emotion regulation (Eisenberg, 2001; Shields & Cicchetti, 1997). Indeed, self-regulation in early childhood appears to have long term developmental benefits. A preschool age child's ability to delay gratification is linked to later indices of cognitive and social competence (Shoda, Mischel, & Peake, 1990). In the shorter term, toddlers who are better able to regulate negative emotion appear more ready for the behavioral demands of formal schooling (Blair, 2010). Children who were shown to possess self-control were rated in adolescence by their parents as more academically and socially competent, rational, and able to cope well with stress and frustration (Mischel, Shoda, & Peake, 1988). Similarly, children rated on the high end of early childhood self-control were rated as the highest on self-control in adulthood (Moffitt et al., 2011). Moreover, early problems with self-control and emotion regulation often persist into adolescence and adulthood. In a longitudinal study of the long-term effects of self-control, a lack of self-control at age three was found to predict a lack of self-control in early adulthood, at age 26 (Moffitt et al., 2011). Evidence has led researchers to conclude young children who struggle to control their negative emotions are at greater risk for undesirable developmental outcomes later in life, including the development of internalizing and externalizing disorders (Cole, Michel, & Teti, 1994; Morris et al., 2003).

Kopp (1982; 1989) contended that the development of emotion regulation depends on a

child's inner resources but requires the input of caregivers in order for children to acquire appropriate regulatory strategies. The nature and quality of these interactions is thought to contribute to children's growing ability to regulate their own emotions (Blair, 2010; Cole, et al., 2004; Eisenberg, Cumberland, & Spinrad, 1998; Morris et al., 2003). These authors call for studies of parental socialization of emotion regulation to accomplish two important goals: (1) to document the conditions under which children acquire skill at emotion regulation and (2) to generate an evidence base that can be applied to early childhood preventive and therapeutic interventions for parents of young children.

Evidence indicates that toddlers whose parents consistently respond to their negative emotional displays, such as frustration, develop over time the skills needed to cope with negative emotion on their own. By this stage, children are able to engage in self-regulation when social support is present, even if that support is not directed at helping the child cope with the current situation (Grolnick et al., 1996). Mothers who were reacted sensitively to their infants' changing emotional cues had infants who were less likely to react negatively and used more regulatory behaviors than infants with mothers who reacted less sensitively to their cues (Cohn & Tronick, 1983; Gable & Isabella, 1992; Stifter & Moyer, 1991). Conversely, infants with a history of nonresponsive or insensitive parents are hypothesized to minimize or maximize negative emotion during frustrating circumstances (see Eisenberg et al., 1998 for review).

Caregiver support of emotion regulation development can be seen beginning in infancy. A mother's level of sensitivity has been found to reflect the mother-child attachment bond. A secure bond is said to promote the child's ability to express a range of emotions, cope with a changing environment, and tolerate frustrating circumstances, which foster the ability to regulate emotion (Cassidy, 1994). However, to design an intervention, it is necessary to study what

sensitive parents do specifically to help their children learn to regulate emotion.

Several parenting strategies have been identified to help children develop self-regulation. Emotion coaching is one strategy in which parents acknowledge, label, and educate their children on how to deal with their emotions (Gottman, Katz, & Hooven, 1997). Emotion coaching has been found to help children control negative affect, which is then expected to promote socially skilled behavior (Eisenberg et al., 1998). Parents who use emotion coaching have children who are physiologically well regulated, which in turn predicts their child's ability to regulate negative emotion (Eisenberg et al., 1998). Another socialization strategy that has been found to be important to children's development is promotion of internal state language. Between 18 and 36 months, children make rapid strides in their emotion language and by the preschool years, children begin to express awareness that emotional experience can be controlled (Bretherton, Fritz, Zahn-Waxler, & Ridgeway, 1986). Children's ability to talk about emotion is assumed to reflect a fundamental ability to regulate emotion (Denham, Cook, & Zoller, 1992); recent work indicates that mother and child use of emotion terms in the toddler years predicts later anger regulation (Armstrong, Cole, LeDonne, & Tan, under review). However, it would be surprising if the use of emotion terms were all that was required for parents to foster child self-regulation.

One possibility is that parents engage in behaviors that recruit a child's emerging cognitive, language, and executive function skills to help them self-regulate. We refer to such behavior as structuring. Children who are provided support and structure by their parents at a developmentally appropriate level by their parents that match their needs should be more likely to internalize effective strategies for dealing with challenge and distress (Cole et al., 1994). Various researchers have considered related concepts that they refer to as structuring. For

example, Biringen (2000) indicates that optimal structuring involves providing consistent, but not excessive, framework, rules, regulations, and expectations for the child and the relationship (Biringen, 2000). By providing clues and suggestions for a child, parents promote child self-regulation, giving the child the opportunity to regulate his or her own emotions without doing it for the child. This viewpoint is consistent with the idea that parents capitalize on developing skills of the child in the course of a child's development of self-regulation of distress and negative emotion (Kopp, 1989).

### *Emotion Regulation*

Emotion regulation has been defined in several ways in previous literature and there is debate on how it should be defined (Cicchetti, Ackerman, & Izard, 1995; Gross, 1998; Kagan, 1994; Stansbury & Gunnar, 1994; Underwood, 1997). Kopp (1982, 1989) defined emotion regulation as a sub-category of self-regulation generally and described five developmental phases between an infant's reliance on adults and a child's ability to regulate distress and negative emotion. She defines emotion regulation as the term used to describe the processes that one uses to manage increased levels of both positive and negative emotions (Kopp, 1982).

For the present study we will be focusing specifically on toddlers' regulation of negative emotions, particularly anger and sadness, when they must endure a potentially frustrating wait. The ability to delay immediate satisfaction for the sake of future consequences has long been considered an essential achievement of human development (Shoda et al., 1990). This ability requires self-regulation, which, according to Kopp (1982), "[...] involves the ability to use numerous contingency rules to guide behavior, to maintain appropriate monitoring for appreciable lengths of time and in any number of situations, and to learn to produce a series of approximations to standards of expectations" (p. 210).

Several factors have been found to be associated with child emotion regulation, including characteristics such as specific parenting practices (e.g. emotion coaching, reactions to children's emotions), family emotional climate, and observation of others (Morris, Silk, & Steinberg, 2007). Unsupportive parental responses to a child's negative emotions have been linked to inappropriate emotion regulatory strategies in instances of anger provocation. In contrast, maternal reactions that promote problem solving are positively related to children's ability to cope with negative emotion (Eisenberg, Fabes, & Murphy, 1996). However, structuring is a unique strategy that can be implemented while the child is displaying negative emotion.

### *Structuring*

Structuring refers to parents' support of the child's learning in a way that is sensitive to the child's emerging skills and abilities (Biringen, 2000). Structuring can include setting rules and limits, and create a framework for interactions. Structuring originates from Vygotsky's concept of scaffolding, in which the parent must adapt and alter their behaviors to match their children's gestural and verbal signals and to provide verbal input that is developmentally appropriate and supports the child's level of understanding and use of words (Landry, Smith, Swank, & Guttentag, 2008). Maternal scaffolding behaviors during the preschool period have been found to play an important role in the children's later emotional development, including the emergence of children's regulatory and behavioral competence (Hoffman, Crnic, & Baker, 2013). Although concepts of structuring and scaffolding are common in the literature, they are generally judged globally. In addition, Vygotsky's concept of scaffolding requires that the parent have accurate knowledge of the child's abilities and that the child successfully executes the behavior. In contrast, the definition of structuring used in the present study makes neither a requirement. The parent may unintentionally engage in effective structuring and the child may

learn from the parent's attempts even if the child cannot execute the action (Cole & Reitz, 2006).

### *Present Study*

The aim of the present study was to account for variance in child emotion and behavioral organization in the latter half of a long (eight minute) wait by first considering the child's earlier ability to tolerate the wait and then the mother's use of structuring in the earlier part of the wait. Specifically, children were told by their mothers that the child must wait to open a gift until mother had completed some work; the child was given one boring toy with which to play and the mother allowed the child to open the gift after 8 minutes had elapsed. This research is part of a larger longitudinal study that aims to understand age-related changes in the expression of anger and attention focus.

From previous research 36 months of age was identified as an age at which some but not all children are able to initiate self-regulatory behaviors, such as distracting themselves from the unopened gift, that appear to help them tolerate the wait and postpone getting angry or sad (Cole et al., 2011). However, in previous work, the behavior of the child was examined using variables such as the average duration of anger or distracting oneself. Unanswered is whether the way the mother-child dyad negotiate the opening minutes of the wait contributes to the more global judgment that the child was generally able to tolerate the wait. Therefore, this thesis posed a follow-up question: Does a child's ability to show tolerance of waiting in the latter half of a long (8 minute) wait depend on the child's ability to tolerate the wait in the first half or does it also depend to a degree on the mother's ability to structure child self-regulation in the first half of the task? Tolerance was considered a form of emotion regulation and defined by (a) the child's overall emotional demeanor in each 4 minute half of the task and (b) the organizational quality of the child's behavior. The question allowed us to address the degree to which mothers who

structure more frequently during the first half of the task contribute to positive or negative emotion regulation behaviors in the second half of the task. Similarly, mothers whose structuring attempts were given higher quality ratings are predicted to have children who are better able to regulate their emotion during the second half of the task.

## METHOD

For the larger longitudinal study, a multi stage strategy was used to recruit families. Families were recruited from rural and semi-rural communities in central Pennsylvania. To participate in the study, families had to meet certain inclusion criteria. First, family income was restricted to households that were economically strained. An economically strained household was defined as having a household income above the poverty level set by the federal government and below the national median income level for the family's size. This criterion was not standard for the present study, as two of the families fell above the income limit in the present study. Second, the child had to be 18 months old at the first lab visit ( $SD = 2$  weeks). Third, the child had to have lived with the primary caregiver from at least three months of age. Finally, the child could not have a condition that would interfere with the ability to participate in the laboratory procedures, such as blindness.

Families were recruited through a multistep process. First, researchers used US census data to identify communities in rural Pennsylvania that contained a large percentage of families with young children who met the income criteria of the study. Next, further research on these communities was conducted to gain familiarity with them. After this, researchers contacted community leaders in medicine, education, politics, and religion to understand the communities further and to familiarize community leaders with the research study. When all necessary information of the communities was collected, undergraduate research assistants searched through published birth records to find and contact eligible families to participate. Letters were sent to the homes of potential participating families asking for their participation. Researchers also recruited participants at community events and by putting fliers in daycare and preschool centers. Interested families were given additional information about the study through a phone

interview, in which they were also determined whether they met the eligibility requirements. If the requirements were met, a second demographic-based phone interview was conducted and the family was signed up for their first visit.

### *Participants*

Of the 120 children participating in the study, 94% were identified as Caucasian, and 5.8% as being from an ethnic minority (including African American, Hispanic, and Asian). There are several other notable characteristics of the families participating in this study. At 18 months, 19% (n = 23) of mothers had only finished high school, 15.7% (n = 19) of mothers had attended vocational school, and 63% (n = 76) of mothers had taken some college courses. 28% (n = 34) of mothers described themselves as unemployed or homemakers, 32% (n = 39) worked part time, and 39% (n = 47) worked full-time. Finally, of the children participating in the study, 45% (n = 54) were the first-born, 38% (n = 45) were the second-born, 12% (n = 15) were the third-born, and 5% (n = 6) were the fourth-born or later-born in their family structures.

The aim of recruitment was to enroll 125 families based on power analysis. Using this recruitment strategy, 128 families were enrolled and of these families, 124 were income eligible. Families were seen at child ages 18, 24, 30, 36, 42, and 48 months and 5 years. Visits were conducted in the families' homes when the child was 18, 30, 36, and 42 months, and five visits were conducted in the laboratory of the Child Study Center at The Pennsylvania State University when the child was 18, 24, 36, and 48 months and 5 years. 120 families participated in all or most of the nine visits, resulting a retention rate of 96.8% that we attribute to our efforts and to the values of the participating families. Withdrawn families did not differ from those who completed the study on any demographic characteristic. The current project uses data from the lab visit when the children were 36-months-old. The data includes 120 typically developing

children (64 boys), and their mothers. Each child was 36-months-old for the lab visit (M age in months = 35.67, SD = .85). Each laboratory visit included standardized intelligence testing, language testing, and naturalistic observation of children in a variety of tasks, ranging from non-frustrating to frustration-inducing activities. Only the procedure that was used for the present study is described.

### *Procedure*

Emotion regulation and structuring were measured using the *Wait Task*, a laboratory task used to elicit frustration in young children. Research assistants gave mothers the directions for the procedure of the task in advance. The mother is given paperwork to complete at a table for eight minutes. The research assistant then hands the child a wrapped gift in shiny paper and ribbon, followed by an undesirable toy. At 36 months, the toy is a red plastic car with the wheels removed. The research assistant tells the child, “This is a surprise for you, and here’s something for you to play with.” Upon leaving the room, the mother is instructed to tell her child that the child must wait until the mother is done with her paperwork before opening the surprise. Mothers are instructed to behave as they typically would when they require that the child wait. The children must then find ways to entertain themselves for the eight minutes, whether it be playing with the toy or finding another distraction in the room, while the mother is preoccupied with the paperwork. After the eight minutes had elapsed, the RA returns to the room and allows the child to open the gift. The mother and child were video recorded from behind a two-sided mirror so that research assistants could code the task after the visit.

### *Measures*

Two coding systems were used by two independent coding teams to gather data for the Wait Task. The first system was designed to classify emotion regulation on a global scale.

Rather than focus on momentary measures of emotion and behavior, the system allowed coders to make more global judgments about the overall quality of how the child handled each half (the first and second four minute periods) of the wait. The second system was designed to assess the mother's use of structuring, which is described in greater detail below. The variables used for the present study were taken from these two coding systems.

### Global Emotion Regulation Coding

Emotion regulation was measured using the Development of Toddlers Study Global Emotion Regulation Coding System (adapted from Cole & Zahn-Waxler, 1988). Children were rated two times, once for the first four minutes of the task and once for the second four minutes. They were first rated on their general emotional state: positive emotion, negative emotion, mixed emotions, or neutral emotion. Positive and neutral were aggregated and renamed as "content" because coders were not reliable on making a distinction between the two categories. Negative and mixed emotions were also combined and renamed as "negative" due to the rare occurrence of mixed emotion. The children were then rated on their organizational quality: organized - on task, organized - off task, or disruptive. A rating of *organized on-task* was given to children who spent the majority of the four minutes shifting attention from the gift and focusing on an appropriate activity, e.g., playing with the undesirable toy or distracting themselves in some other appropriate way. This classification included spending time moving around the furniture, singing, or talking aloud about the posters on the wall. A rating of *organized - off task* was given to children who spent the majority of the four minutes in appropriate behavior but could not yet distract themselves (i.e. be on task). These children lingered around the mother, watching her work, wandered around the room, or might sit and look at the gift. A rating of *disruptive* was assigned when children's behavior was predominantly inappropriate, defined as behavior that

most adults would try to stop.

The coders were trained to 80% reliability under master coders. Once reliability was reached, each individual case was coded independently. The general percent agreement between coders was 91% for emotion ratings and 85% for organization ratings. The two classifications— i.e. the child’s predominant emotion and the overall behavioral organizational quality— were used to create variables for the data analyses. These two classifications yield 6 possible categories of child behavior, shown in the table below:

Organizational Quality	General Emotional State	
	Content	Negative
On-Task	Content / organized - on task	Negative / organized - on task
Off-Task	Content / organized - off task	Negative / organized - off task
Disruptive	Content / disruptive	Negative / disruptive

### Structuring Coding

Structuring was measured using the Development of Toddlers Study Parental Structuring Coding Manual (Cole & Reitz, 2006). For this coding system, the eight-minute task was divided differently than for global emotion regulation coding. For structuring, the 8 minutes were divided into 32 15-second epochs and each epoch was coded individually. Each epoch was first coded as structuring, directing, or neither. If structuring was not coded, the rest of the epoch would not be coded. Parental strategies used to structure the child’s regulation of emotion, which were parental use of emotion, physical movement, and language, were also rated but these subcategories were not a focus of the present study. Similarly, the coders determined which child skills the mother was attempting to recruit; these were attention focus, attention redirection, distraction, planning, language, and response inhibition. These subcategories are also not analyzed in the present study. The level of success that the child had in response to the mother’s

structuring attempt was also coded, but not used in this study.

The structuring data that was used in the present thesis focused on (a) frequency of parental structuring attempts and (b) the quality of parental structuring attempts. Mothers could have structured a maximum of 32 times throughout the entire task, or 16 times per half. Quality of mothers' structuring attempts was rated using a 0-4 scale. A rating of 4 was given to high quality structuring attempts that used creativity and/or skill and the mother was consistently sensitive throughout the entire epoch. A rating of 3 was given if the mother made a clear and elaborated attempt at structuring, but the level of sensitivity may not have been consistent throughout the entire interaction. The mother was given a rating of 2 if she utilized slightly elaborated or enthusiastic structuring behaviors, but they were not considered developmentally sensitive for her child. A rating of 1 was given for minimal quality structuring attempts that were brief, unelaborated, incomplete, or out of sync with the child. Lastly, a rating of 0 was given if structuring did not occur during the epoch. These ratings were averaged for each half of the task.

Teams of undergraduate research assistants, trained by a master coder, coded maternal structuring from video records of the wait task. Once reliability was established, the master coder continued to provide weekly supervision to the teams and intermittently doubled coded tapes to prevent observer drift. Reliability was established from 15% of the sample. The coding teams highly agreed with the master coder regarding whether structuring occurred, as reliability calculations yielded a Kappa value of .94. Reliability estimates for structuring quality ratings yielded an intra-class correlation of .84.

## RESULTS

Tables 1a and 1b present the means, standard deviations, and ranges of mothers' frequency of structuring and directing during each half of the wait task as well as the descriptive statistics for their average quality of structuring attempts. On average, mothers structured more in the first half ( $M = 8.45$ ,  $SD = 3.13$ ) than the second half of the wait ( $M = 6.66$ ,  $SD = 3.78$ ),  $t(118) = 6.08$ ,  $p < .01$ . No significant change in quality was found,  $t(113) = 1.33$ ,  $p = .19$ . In addition, directing, which did not occur in the absence of structuring very often, did not differ across the two halves of the task,  $t(118) < 1$ ,  $p = .34$ .

Table 2 presents the distribution of ratings of children's predominant emotional demeanor (content or negative) and of the overall organizational quality of their behavior (organized - on task, organized - off task, or disruptive) for each half of the task. Two children were omitted from the second half of the task because they opened the gift before the task ended.

The majority of the children remained in the same emotional category (content or negative) during both halves of the task, Fisher's exact test,  $p < .0005$ . That is, 88.8% of the children rated as predominantly content in the first half of the task were rated as content in the second half of the task. Similarly, 76.3% of the children rated as predominantly negative during the first half of the task were rated as predominantly negative in the second half. In terms of the overall organizational quality of their behavior, the findings were similar but also revealed more variability,  $\chi^2(4) = 41.056$ ,  $p < .0005$ . Specifically, 40% of children ( $n = 20$ ) rated as predominantly organized and on task in the first half remained so in the second half; another 45% became organized - off task and 15% became disruptive. Of 61 children rated as off task in the first half, 57.4% remained off task, 24.6% became on task, and 18% became disruptive. Finally, of the 37 children who were disruptive in the first half of the task, 75.7% remained

predominantly disruptive, 21.6% became organized but off task, and only 1 (2.7%) became organized and on task. In sum, there appears to have been somewhat more variability in child behavioral quality across segments of the task than there was variability in child emotion but the data show significant consistency.

In addition to examining task period differences in mean levels of maternal structuring, Pearson correlations were used to learn the degree of correlation between structuring frequency and quality in each half. A positive correlation was found between the frequency of structuring across the two halves of the task,  $r = 0.58, p < 0.01$ . Similarly, a positive correlation was also found for structuring quality across the two halves of the task,  $r = 0.61, p < 0.01$ . In addition, a small but significant positive correlation was found between structuring quality in the first half of the task and structuring *frequency* in the second half,  $r = 0.17, p < 0.05$ , such that more sensitive structuring in the first half was associated with more use of structuring in the second half.

To test the study's central questions, two logistical regressions were used. The first regression focused on predicting children's second half predominant emotion as a function of their predominant emotion in the first half and of maternal structuring frequency and quality. The order of entry of predictor from the first half of the task was: (1) child predominant emotion, (2) frequency of maternal structuring, and (3) average quality of maternal structuring. The child's first half emotion predicted the child's second half emotion, Wald (1) = 33.224,  $p < 0.0001$ . Maternal structuring frequency also predicted child emotion in the second half of the task, over and above, the stability of child emotion, Wald (1) = 4.705,  $p = 0.03$ . That is, the frequency of maternal structuring in the first half, contrary to prediction, was *positively* associated with child negative emotion in the second half. Finally, structuring quality was not predictive, Wald (1) < 1,  $p = 0.95$ .

A parallel logistical regression was conducted for the overall organizational quality of child behavior in the second half of the task. In this analysis, the quality of the child's behavior in the first half of the task predicted the quality of the child's behavior in the second half of the task, Wald (2) = 7.239,  $p = 0.007$ . Contrary to prediction, neither maternal structuring frequency nor structuring quality predicted the overall organizational quality of child behavior in the second half of the task,  $p = .978$  and  $p = .615$ , respectively.

The results provided partial support for our hypotheses. As expected, given the typical stability of human behavior, child emotion and behavior in the first half of the task predicted child emotion and behavior in the second half. Children who were predominantly content during the first half of the waiting were likely to remain so; children who were predominantly negative also remained so, yielding very few children who changed in their predominant emotional demeanor from the first to the second half of the task. Similarly, the organizational quality of children's behavior in the two segments was relatively constant, although there appeared to be more change in the organizational quality of child behavior than in the child's predominant emotion. Contrary to prediction, maternal structuring had an effect in only one of four ways that it was tested, and in that single case the frequency of maternal structuring was associated with more predominantly negative emotion in children during the latter half of the wait. Each of these findings is discussed below, as are the limitations of the study and suggested future directions.

#### *Predicting Children's Emotion*

As noted, children's predominant emotion in the first half of the task significantly predicted their predominant emotion in the second half of the task. Indeed, only 15% of the children changed in their predominant emotional demeanor. Once the stability of child emotion was taken into account, the frequency of mothers' structuring in the first half additionally predicted child emotion in the second half of the wait, but the effect was unexpectedly in the opposite direction of the prediction. Instead of maternal structuring frequency appearing to help an emotionally negative child cope with the wait, it appeared to contribute to the child being predominantly negative in the second half of the wait. Visual inspection of the videos seemed to suggest several possibilities that warrant further assessment. First, some mothers may engage in

structuring too frequently; their style of interaction may be experienced by the child as intrusive or insensitive and thus not help the emotionally negative child cope. Parental scaffolding requires that parents provide just enough support to help the child accomplish a desired skill and then withdraw support once that skill has been reached (Kermani & Brenner, 2000). However, if insensitive structuring was a factor, structuring quality might have had a facilitative effect on improving child emotion, but it did not. Another possibility is that certain children, when distressed, become more rather than less distressed as their mothers continue to try to structure them. Perhaps there are three-year-olds who reach a certain level of distress at which point any maternal effort would be ineffective; when ineffective, some mothers may persist in trying. This study did not make the fine differentiation needed to address these possible explanations for the unexpected finding, but future studies could investigate these nuances more directly. However, it is important to note that there was very little change in predominant emotional tone for most of the three-year-olds and therefore very little variance with which to test structuring effects on child emotion. That is, once young children were *predominantly* negative for four minutes it may have been too difficult to redirect their emotion. Future research might benefit from examining child emotion in smaller time frames.

As noted, the quality of mothers' structuring in the first half of the task was unrelated to the child's emotion in the second half. Again, the high level of stability of child predominant emotion may have precluded the opportunity to see an effect of structuring quality. Most children were rated as content throughout the task, which was similar to the results of the Dennis et al. (2009) study, in which children remained relatively calm despite periodic expressions of mild frustration associated with waiting. Also, the global emotion codes, designed to categorize behavior over a four-minute period, may be too general and overlook nuances of mother-child

interaction. For example, other studies using micro coding of emotion and behavior have found that most typically developing children in this age range display negative emotion during waiting tasks (Cole et al., 2011; Grolnick et al., 1996). In a study that better captured micro-momentary changes in child emotion over time, it would be interesting to explore whether the success of a mother's structuring attempts contributes in a given moment contributes to a child's ability to shift from negative to content despite the challenge faced.

#### *Predicting the Organizational Quality of Child Behavior*

As noted, there appeared to be more change between the four-minute task segments in the organizational quality of child behavior than there was for child predominant emotion. Despite the fact that the behavioral classification may have better optimized the chance of observing effects of maternal structuring, neither structuring frequency nor quality predicted child behavioral organization in the second half of the task. Only child first half behavior was predictive of child second half behavior.

Particularly interesting are two sets of children: those who were classified as organized - off task in the beginning of the wait but who were classified as either organized - on task or disruptive by the second half of the wait. Nearly half of the children (42.6%) fell into these categories. Nonetheless, change did not appear related to maternal structuring. One possible explanation for this lack of relationship could be that the type of structuring mattered. In the structuring codes, mothers can structure one of six behaviors: attention focusing, attention redirecting, distraction, planning, language, and inhibitory control. In this study, these skills were not considered; however, it is possible that differences in which skills mothers attempt to structure would be associated with differences in levels of child success with emotion and behavior. Parents must determine which capabilities their child has mastered and which their

child is in the process of developing (Conner, Knight, & Cross, 1997). For example, at this stage of development, a toddler may respond better to the mother structuring distraction (i.e. taking the child's attention away from the surprise and onto the boring toy or something else in the room) than to planning (i.e. having the child think about some future consequence).

Another reason the predictions were not supported may have been due to the approach of dividing an eight minute task into two four minute segments and classifying child behavior on the basis of four minute periods. Mothers who used high quality structuring attempts, i.e. efforts to recruit the child's developing cognitive and linguistic skills to foster self-regulation that were developmentally attuned and well timed, may have succeeded in the moment even if they did not redirect the child's behavior effectively over the course of the larger time period. Moreover, structuring attempts may not have an immediate effect but over time repeated sensitive structuring may nonetheless contribute to children's ability to self-regulate. This is a question that requires longitudinal study design.

A reason for using four minute time segments, however, is that most parents and teachers judge children's behavior on the basis of a larger time frame than is captured by micro-coding that occurs in one, five, or ten second units of time. Larger time frames may capture appropriate judgments about child behavior but nonetheless overlook subtle effects of adult behavior on child behavior, such as those captured in the Dennis et al. (2009) study.

These possible explanations highlight limitations of the current study. Relating a sum of maternal behavior such as structuring frequency to a classification of child behavior omits consideration of behavioral sequences in the mother-child interaction. Although the aim of the study was to examine positive effects of maternal structuring among young children faced with a self-regulation challenge, it is important to appreciate the dyadic nature of interaction and the

mutual influences of the child on the mother's behavior and the mother's behavior on the child. Perhaps examination of behavioral sequences might have explained why many off-task children became on-task later in the wait while others became disruptive.

Overall, the present study has examined 36-month-old toddlers' ability to tolerate negative emotion and how their mothers use structuring to help the toddlers accomplish this self-regulation. The hypotheses for were partially supported, most notably finding that mothers' higher frequency of structuring in the first half of the task predicted children's negative emotion in the second half, but their quality had no relation, and that neither mothers' frequency nor their quality of structuring in the first half of the task predicted the child's behavior in the second half. Though this study has some limitations, there are several directions that can be taken for further research to further the research on the topics of emotion regulation and structuring.

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Table 1a. Means, standard deviations, and ranges for maternal structuring and directing frequency during each half of the wait task.

	M	SD	Range
Frequency			
First Half of Wait Task			
Structuring	8.45	3.13	2-16
Directing	.20	.67	0-6
Second Half of Wait Task			
Structuring	6.66	3.78	0-15
Directing	.27	.65	0-3

Table 1b. Means, standard deviations, and ranges for maternal structuring quality during each half of the wait task.

	M	SD	Range
Quality			
First Half of Wait Task			
Structuring	2.54	.38	1-3.60
Second Half of Wait Task			
Structuring	2.49	.43	1-3.60

Table 2. Frequency and percent of cases for each child global emotion regulation category for each half of wait task.

First Half of Wait Task			
	Child Emotion		
	Content	Negative	Total
Child Behavior			
Organized - On Task	19 (15.8%)	1 (0.8%)	20 (16.7%)
Organized - Off Task	49 (40.8%)	13 (10.8%)	62 (51.7%)
Disruptive	14 (11.7%)	24 (20.0%)	38 (31.7%)
Total	82 (68.3%)	38 (31.7%)	
Second Half of Wait Task			
	Child Emotion		
	Content	Negative	Total
Child Behavior			
Organized - On Task	23 (19.5%)	1 (0.8%)	24 (20.3%)
Organized - Off Task	41 (34.7%)	11 (9.3%)	52 (44.1%)
Disruptive	16 (13.6%)	26 (22.0%)	42 (35.6%)
Total	80 (67.8%)	38 (32.2%)	

# ACADEMIC VITA

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### Education

Schreyer Honors College at The Pennsylvania State University May 2014  
The College of the Liberal Arts

Major: Psychology, B.A.  
Minor: Human Development and Family Studies

### Scholarships & Awards

Evan Pugh Scholar Award	February 2014
Liberal Arts Academic Scholarship	September 2012, 2013
President's Freshman Award	May 2012
Dean's List	All Semesters
Liberal Arts Superior Academic Achievement Award	All Semesters

### Research Experience

Development of Emotion Regulation Laboratory January 2013-May 2014

Title: Undergraduate Research Assistant

Location: Penn State University

Supervisor: Dr. Pamela Cole

Description: This lab studies emotional development in early childhood and the contributions of parents as they interact with their children. I am currently working on the Development of Toddlers Study (DOTS), a longitudinal study tracing changes in children's ability to regulate anger. My primary roles in this lab include transcribing and coding parent-child interactions and analyzing data using SPSS. I also attend weekly lab meetings with Dr. Cole and the graduate students working on this project.

Personality, Psychopathology, and Psychotherapy Laboratory August-December 2012

Title: Undergraduate Research Assistant

Location: Penn State University

Supervisor: Dr. Kenneth Levy

Description: This lab focuses on attachment theory, emotion regulation, personality disorders, and psychotherapy process and outcome. My roles in the lab included transcribing Adult Attachment Interviews, coding graduate school information, organizing participant information, and adding research articles into the database.

## Clinical Experience

Western Psychiatric Institute OCD Intensive Outpatient Program

May-August 2013

Title: Student Extern

Location: Pittsburgh, PA

Supervisor: Josh Hefferen, LCSW

Description: Through this externship I worked directly with children and adolescents with primary diagnoses of obsessive-compulsive disorder using exposure therapy with response prevention. This program is one of the only in the country to practice this type of therapy in a group setting. I helped the individuals work through anxiety-provoking exposures to help extinguish their obsessions and compulsions. I also attended weekly treatment team meetings.

Barber National Institute

May 2013-Present

Title: Part Time Aide

Location: Bridgeville, PA

Supervisor: Thad Jackman

Description: I work with adults with developmental disabilities at a day program designed to maximize individual strengths and increase community integration. My responsibilities include working with clients to develop communication, social, and occupational skills.

## Specialty Training and Certificates

CITI Biomedical Research Training

IACUC and Occupational Health Training

Penn State IRB Basic Training

Laboratory Safety and Chemical Safety Certification

Adult Attachment Interview (AAI) Transcription Training

HIPPA Certification

CPR and First Aid Certification

## Related Coursework

- Introductory Psychology
- Psychology as a Science and Profession
- Introduction to Abnormal Psychology
- Introduction to Cognitive Psychology
- Introduction to Developmental Psychology
- Introduction to Personality Psychology
- Introduction to Social Psychology
- Honors Basic Research Methods in Psychology
- Introduction to Clinical Psychology
- Abnormal Psychology
- Adolescent Psychology
- Senior Seminar: Psychology of Marriage and the Family
- Introduction to Human Development and Family Studies

- Infant and Child Development
- The Helping Relationship
- Adult-Child Relationships
- Resolving Human Development and Family Problems
- Honors Family Relationships
- Introductory Statistics
- Research Project in Psychology
- Senior Honors Thesis Writing in Psychology

### Other Coursework

- Human Body: Form and Function
- Honors Introduction to Biobehavioral Health
- Sex and Evolution
- Energy Conservation for Environmental Protection
- Honors Introduction to Disability Culture
- Introductory Sociology
- Effective Writing: Writing in the Social Sciences
- Honors Rhetoric and Civic Life
- Finite Mathematics
- The Mathematics of Money
- Elementary Spanish I, II, III
- Honors First Year Seminar in Classics and Ancient Mediterranean Studies
- Introduction to International Arts
- Honors Leadership Mentor
- Jewish Studies
- Educational Theory and Policy