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**PARENTING AS ADAPTATION: CHANGES IN MATERNAL STRUCTURING
ACROSS EARLY CHILDHOOD**

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Psychology

By

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ABSTRACT

It has been proposed that competent parenting requires adaptation to children as they grow and develop (Teti & Huang, 2005). In line with the belief that parents play an important role in children's development of self-regulation in the toddler and preschool years (Kopp, 1982), then, parenting should show longitudinal change during this period as parents adapt to their children's changing skills. Maternal structuring behavior was examined longitudinally to determine patterns of growth in terms of its frequency, the targets of the structuring attempts, and the strategies used to structure. To examine maternal structuring changes as a form of adaptation, 119 mothers were observed interacting with their children during a wordless reading task at child age 18, 24, and 36 months. Alternative hypotheses about the direction of change in maternal structuring were tested using multi-level modeling; also hypotheses about changes in the different child skills that mothers targeted, and in the strategies mothers used to structure, were tested. Contrary to prediction, mothers structured at a high and stable rate over time, but as expected they showed significant patterns of change in their targeting of several child skills and structuring strategies. The most notable changes were an increase in mothers' targeting of child attention redirection and a decrease in their use of physical movement to structure child self-regulation. The results provide preliminary evidence that parenting changes during early childhood in ways that are consistent with the view of parenting as adaptation.

TABLE OF CONTENTS

List of Tables.....	v
List of Figures.....	vi
Acknowledgments.....	vii
Introduction.....	1
Method.....	19
Results.....	27
Discussion.....	33
References.....	51
Appendix A: Tables.....	62
Appendix B: Figures.....	67

LIST OF TABLES

Table 1. Descriptive and Reliability Statistics for All Variables of Interest.....	62
Table 2. Intercorrelations Among Child Skills Harnessed.....	63
Table 3. Intercorrelations Among Mothers' Structuring Strategies Used.....	64
Table 4. Intercorrelations Between Child Skills Harnessed and Mothers' Structuring Strategies Used.....	65
Table 5. Linear Growth Models Parameter Estimates, Standard Errors, and Fit Statistics.....	66

LIST OF FIGURES

Figure 1. Growth Curves of Attention Focusing, Attention Redirection, and Child Language Skills Harnessed.....	67
Figure 2. Growth Curves of Distraction, Planning, and Inhibition Skills Harnessed.....	68
Figure 3. Growth Curves of Mothers' Structuring Strategies Used.....	69

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Parenting as Adaptation: Changes in Maternal Structuring Across Early Childhood

Learning to successfully regulate behavior in accordance with the demands of a situation is a critical task of early childhood (Kopp, 1982). However, less well understood is how children acquire these self-regulatory skills and what role parenting plays in their development. Parents are considered to play a central role in successful regulation in infancy and a supportive role later in the toddler and preschool years as children acquire the ability to behave in compliance with the social demands of a situation (Kochanska & Aksan, 2004). Parental behaviors have also been shown to contribute to poor self-regulatory outcomes in some cases, such as maternal controlling behavior which has been linked with the development of behavior problems in the preschool years (Smith, Calkins, Keane, Anastopoulos, & Shelton, 2004). However, less emphasis has been placed on specific behaviors and components of parenting in much of the parenting literature. Rather, much of the research has examined parenting at a global level, such as parenting style, using constructs such as sensitivity or responsiveness to child needs (Ainsworth, Blehar, Waters, & Wall, 1978; Landry, Smith, & Swank, 2006).

An abundance of research points to the toddler and preschool years as a particularly important period for children to begin to behave according to social standards of conduct (Calkins, 2007; Grolnick, Bridges, & Connell, 1996; Grolnick, McMenemy, & Kurowski, 2006; Kochanska, Coy, & Murray, 2001). These self-regulatory skills are considered fundamental to positive developmental outcomes in a number of domains including social competence and academic achievement, and have also been shown to negatively relate to adverse outcomes including the development of childhood psychopathology (Belsky, Friedman, & Hsieh, 2001; Blair & Razza, 2007; Cole, Michel, & Teti, 1994; Eisenberg, Fabes, Murphy, Maszk, Smith, & Karbon, 1995). In particular, it has been well-documented that young children's self-regulation (including components such as attention focusing and shifting, inhibitory control, and planning)

and their readiness for and success upon school entry (Eisenberg, Valiente, & Eggum, 2010). Given the importance of these regulatory abilities, further research exploring how parental input changes during early childhood in support of this skill acquisition is warranted.

During this period of self-regulatory development other skills and abilities also develop rapidly, including attention, language, and inhibitory control, all of which appear to have important relationships to the emergence and development of self-regulatory capacities. The ability to direct attention away from a distressing stimulus and sustain one's focus on a distracting activity has been shown to contribute to children's capacity to regulate their negative emotions (Gilliom, Shaw, Beck, Shonberg, & Lukon, 2002; Mischel, Shoda, & Rodriguez, 1989). Toddler language abilities predict children's later use of self-regulatory strategies, which appear to account for reductions in the degree of anger they express during a delay before being permitted to have a desired object (Pemberton, Cole, & Armstrong, under review). Additionally, children's ability to inhibit prepotent responses in accordance with social demands, such as successfully complying with a request not to peek at a desired object or hiding emotions inappropriate to the social demands of the situation, have important implications for their ability to regulate their emotions (Carlson & Wang, 2007).

When conceptualized as a global characteristic, parenting is typically regarded as a stable, enduring aspect of parental individual differences. However, in light of the rapid developmental changes that take place in early childhood, an alternative framework conceptualizes parenting as *adaptation*; that is, parental behavior changes and adapts as children age and accordingly parenting goals are adapted to the child's developmental period (Teti & Huang, 2005). This perspective may be particularly important for translation to parenting intervention design; one aim of parenting research should be to delineate the components of

parenting that occur in specific parenting situations and are associated with positive developmental outcomes and to document how these components change over time.

The concept of parenting as adaptation to children's developmental level can be linked to theories positing parenting as a transactional process between a parent and child, but goes further by anchoring this bidirectional process within a theory of developmental stages. Parenting theorists have long understood that parents and children mutually influence one other from moment-to-moment and over longer periods of time; this view has underscored research in a variety of domains of child development (Sameroff, 2010). This transactional model of parenting has been applied to understanding the development of behavior problems, in which parents and children develop negative patterns of interaction which reinforce problematic behaviors (Patterson, 1986) as well as to research on parental scaffolding, in which parents instruct their children within a zone of proximal development, building off what a child can do to help them acquire new skills (Vygotsky, 1978). Building off of a transactional theory of parenting, Teti & Huang (2005) go further by suggesting that not only are parents influenced by the developmental level of their child, but that as children enter new developmental stages, the goals of parents and needs of children change, such that competent parenting looks qualitatively different over time. The authors point out that during infancy the goal of parents is to develop a positive and mutually-responsive orientation, but once a child enters the preschool age, parenting goals shift to helping to socialize appropriate standards of conduct to prepare children for school entry. To date, however, little is known about how parenting behavior shifts as children move from one developmental stage to another, and understanding the normative trajectory of change in parenting represents an important first step before interventions can assist parents in adapting competently.

Understanding how parenting as adaptation contributes to children's ability to control and regulate their behavior may be a particularly important area of research given the importance of these abilities for children's successful development. For example, toddlers' behavioral and emotional control measured at two years old has been linked to their social-emotional competence upon school entry (Bandon, Calkins, & Keane, 2010). Self-regulatory skill is thought to emerge early in life, and can be seen in the ways that infants begin to respond behaviorally to their environment in their first few months of life. For example, when presented with a distressing situation, infants as young as 3 months old have been observed to try to distance themselves from the source of their distress or engage in self-soothing actions like putting their hands in their mouths (Feldman, 2009). Researchers who study infants have also observed that they instinctively divert their visual attention away from emotionally evocative stimuli, which serves to temporarily reduce their emotional arousal (Gusella, Muir, & Tronick, 1988; Stifter & Moyer, 1991). These early antecedents to behavioral self-regulation are understood to emerge in infancy, but continue to develop over the course of early childhood (Rothbart, Ziaie, & O'Boyle, 1992). Further developments in children's self-regulatory abilities as infants enter toddlerhood likely lead to different roles for parents as they support their children's developments.

In the toddler and preschool years, children's ability to control their behavior appears to grow and develop; they become more active and purposeful in their efforts, in part because they can deploy skills emerging in other several (e.g., attention, language) to help them regulate their behavior more effectively (Kopp, 1982). Building on rudimentary behavioral modulation skills in infancy (e.g., gaze shifting), children in their first year of life begin to show increasing self-regulatory capacities in situations where they are asked to exert control over their behavior.

Between the ages of 12 and 24 months, for example, children are increasingly able to sustain their attention on a cognitively demanding task (Feldman, 2007). Developmental increases in the amount of time children can refrain from touching an attractive toy have also been noted during the preschool years (Friedman, Miyake, Robinson, & Hewitt, 2011). Indeed, positive relations have been shown between preschooler's ability to direct their attention away from a desired object, or delay their gratification, and their ability to inhibit their behavior in a cognitive control task ten years later (Eigsti et al., 2006). These observational indicators of growth in children's self-regulatory capacities are mirrored in parents' reports of increases in children's ability to engage in self-control from the age of 4 and into middle childhood (Vazsonyi & Huang, 2010). Taken together, this line of research provides strong evidence that the toddler and preschool years are important for the development of self-regulation. It has been asserted that changes observed in children's self-regulatory abilities in the toddler years may be partially attributable to the emergence of effortful control of attention. Rueda, Posner, & Rothbart (2005) showed that the executive attention system may emerge around 30 months of age, allowing children to transition from a reactive or stimulus-driven attention selection system to a more voluntary and controlled attention system.

Research on the development of self-regulation in the toddlerhood and preschool years has also pointed to an important role for parents in helping their children learn to behave appropriately in accordance with social norms. Adding further evidence that the first three years are critical to the development of self-regulation, research suggests that there is growth in children's ability to comply with parental requests during this period of early childhood. Longitudinal observations of children's compliance with their mother's requests not to touch an attractive toy indicate that children show increasing levels of compliance between 14 and 33

months of age but level off by the time they are 45 months (Kochanska, Coy, & Murray, 2001). Further research suggests that children's development of compliance was related to a mutually responsive orientation between a mother and her child earlier in life (Kochanska, Forman, Aksan, & Dunbar, 2004). Though much of the work in this area relies on correlational evidence, these findings suggest that parents likely play an important role in the development of this index of behavioral control.

Kopp's (1982) framework highlights the involvement of several domains of cognitive development that influence the development of self-regulation as well as the important role of parental input. As part of her general conceptualization of the development of self-regulation (1982), Kopp emphasizes the child's use of emerging speech and attention skills to regulate social behavior. Following this theory, parents and other caregivers of young children contribute to the child's development of self-regulation by fostering the integration of language and cognition for the purpose of dealing with emotion. As noted, however, research on parental contributions has tended to focus on the relationship aspects of the parent-child interaction. The more mutually positive and responsive to distress a parent is to an infant, for example, the better able and the more motivated the child is to develop autonomous self-regulation (Kochanska, Aksan, & Carlson, 2005; Kochanska, Forman, Aksan, & Dunbar, 2005). In addition to the establishment of a positive and responsive parent-child relationship, however, another important parental contribution may entail whether or not, and the manner in which, parents recruit child cognitive and linguistic skills to encourage the child to self-regulate.

There is no standard method of assessing how parents recruit children's cognitive and linguistic skills to encourage child self-regulation. One useful conceptual framework, however, is the concept of scaffolding or structuring. These terms have been used variously (Biringen,

2000; Conner, Knight, & Cross, 1997; Neitzel & Stright, 2003;) but generally relate to the idea that an adult can foster a child's use of skills to engage in appropriate behavior that the child may not be able to execute successfully without the adult's guidance. That is, parents can utilize their children's available skills to help them engage in behaviors that are socially desirable aspects of the competencies they must develop. The important feature of scaffolding or structuring is that rather than commanding or prohibiting behavior or directly achieving a goal on the child's behalf, structuring enables the child to engage in the behavior more autonomously. This type of caregiving has been studied mainly in regard to children's cognitive development, focusing on parents and teachers as experts who are instrumental in helping children accomplish what they could not do on their own (Vygotsky, 1978). In line with this theory, positive relations have been found between maternal scaffolding in terms of transference of responsibility to children during dyadic pretend play interactions and higher IQ assessed when the children were 5 years old (Morrisey & Brown, 2009). Mothers' engagement in scaffolding behavior and transference of responsibility to their children in the context of a problem-solving task completed in their home when the children were 4 years old, has also been shown to relate to children's ability to independently problem-solve and regulate their behavior in a school setting a year later (Neitzel & Stright, 2003).

Recently the concept of scaffolding has been applied to how parents structure children's emotion regulatory abilities, though the results of these investigations are somewhat mixed. Consistent with the hypothesis that parental structuring behavior supports children's development of self-regulation over time, it has been shown that the more mothers engaged in scaffolding of 3-year-olds' self-regulation, defined as providing support for children to accomplish what they did not do independently, the less emotion dysregulation and behavior

problems were reported when children were 4 years old (Hoffman, Crnic, & Baker, 2006). This is consistent with Kopp's (1989) view that the development of autonomous self-regulation of emotion would require parental structuring of the cognitive and linguistic abilities that enhance child self-regulation.

The literature on structuring and self-regulatory development does not consistently show a beneficial effect for parenting of this type, however, and the findings are less clear when one considers studies that are cross-sectional, examine at-risk samples, or use somewhat different definitions structuring. One study, for example, found that contrary to expectations, though maternal structuring contributed to children's ability to verbally generation regulatory strategies, it was not related to the regulatory behaviors when coping with frustration (Cole, Dennis, Smith-Simon, & Cohen, 2009). An important limitation of this study, however, was that it was cross-sectional in nature; it may be that parental contributions to children's self-regulation are best understood within the context of development *over time*. Other research suggests that the impact of parental structuring behavior may be differentially related to a child's genetic risk for psychopathology such that structured parenting is related to less development of behavior problems for children at high risk, but is related to more behaviors problems in low-risk children (Leve et al., 2009). This study provides preliminary support for the conclusion that structuring may be beneficial only for some children who are at higher risk, however, the type of structuring examined in this study included parental directives and commands, which may have more to do with parental control than parental support. Thus, though similar terminology is used, the construct investigated this study may be qualitatively different from structuring that supports children acting autonomously, as structuring is conceptualized in the present study. Additionally, researchers have concluded that a form of parenting called positive guidance,

which shares similarities with structuring but includes praise and positivity directed towards a child, was related only to behavioral regulation but not emotion regulation or physiological indices of regulation in children (Calkins, Smith, Gill, & Johnson, 1998). Taken together, these mixed results suggest that the relationship of structuring to children's regulatory development may be complex in nature, and that results likely have much to do with the population examined, the time course of the study, and the way that parental structuring behavior is conceptualized.

When considering the impact of parental structuring on children's self-regulation, it is important to appreciate the developmental period in which children are making some of their first important advances in self-regulation. Parenting practices, including structuring of self-regulation, are likely to change over the course of a child's life as the child's abilities develop and parental goals and demands shift over time. Teti & Huang (2005) provide a perspective on parenting as an adaptation to changing children's needs, demands, and developmental level. They propose that competent parenting must change over time, that is adapt to children's changing needs and demands at different stages of their lives, and respond to developmental changes in their children, such as their rapid growth in language, and changes in their behavioral and emotional control . In infancy, for example, evidence suggests that the primary task of successful parenting centers around the development and consolidation of a positive and trusting bond between the parent and child which contributes importantly to children's later social and emotional competence and socially appropriate behavior in childhood (Berlin & Cassidy, 2003; Kochanska & Aksan, 1995). There is an increasing understanding that as children subsequently enter the toddler and preschool years, the goals associated with competent parenting change as children take a more active role in the regulation of their behavior and parents support and guide these emerging self-regulatory abilities by helping them learn to display socially and culturally

appropriate behavior (Grusec & Goodnow, 1994; Kochanska, Coy, & Murray, 2001; Kopp, 1982). If one accepts the idea that parenting demands will change as children become more competent and skilled regulators, an important direction in understanding parenting through a developmental lens should explore how parents adapt responsively to and in anticipation of their children's emerging capacities.

When included in parenting models, structuring or scaffolding has typically been construed as one aspect of a broader construct of high quality parenting. Constructs such as responsive parenting capture an array of maternal behaviors such as maintaining a child's attention or interest in an object with which he or she is engaged or redirecting the child's attention elsewhere, as well as structuring behaviors such as verbally scaffolding in the course of conversation with the child by providing verbal hints or prompts related to the context of the interaction (Landry, Smith, Swank, & Guttentag, 2008). Thus, according to this conceptualization, structuring is just one kind of behavior exhibited by responsive parents. This line of research suggests that structuring may be an interesting aspect of parenting to study, but inadequately explored how parents actively engage their child's skills during the course of an interaction by including it as only one of many components of parental responsive behavior. The notion of parental "structuring" of children's experiences is also a component of parental emotional availability (Biringen, 2000), which describes emotionally available parents as those who actively encourage a child's exploration and learning while respecting their autonomy by attending to the child's cues and behavior. By embedding contingent parenting within a larger framework that includes more global aspects of parenting style such as warmth and sensitivity, however, the ability to examine more closely the specific ways that parents encourage children's development of skills and competencies in their structuring attempts becomes somewhat lost.

Consistent with the idea that competent parenting adapts as children grow, parents' structuring behavior should adapt as children develop more advanced skills for parents to target in their structuring attempts. An interesting question to consider regarding these changes is whether one would expect structuring attempts to increase over time as parents foster and anticipate their children's emerging regulatory skills, or whether structuring might decrease as children are better able to utilize regulatory skills on their own without assistance of their parents. When considering longitudinal changes in parenting behaviors, one line of reasoning would suggest that much of children's environmental and social input is child-driven as children seek out and pull for environmental stimulation in accordance with their age-specific caregiving needs. Thus, structuring would be expected to decrease over time as children are able to regulate their behavior more autonomously and competently and less frequently require parental assistance in practicing the skills necessary for regulation. Longitudinal research on maternal behavior towards distressed infants suggests that mothers engaged in less physical soothing behaviors as their infants developed, consistent with the idea that the infants were becoming more capable of regulating their distress without this form of input from their parents (Jahromi, Putnam, & Stifter, 2004). Alternately, there is some evidence in this study that parents anticipate their children's regulatory skills in early childhood, supporting the prediction that parents will increasingly structure their children's regulatory skills in order to foster and develop these emerging abilities. Jahromi, Putnam, & Stifter (2004) showed that parents increasingly attempted to use distraction (a regulatory strategy shown to be effective for toddlers at reducing distress) over time, though their infants did not increase their own use of this strategy during the time frame investigated. Thus, mothers appeared to be anticipating and fostering their children's later use of this regulatory strategy. While changes in the targeted skills structured by parents in

early childhood remain unexplored, evidence from the broader parenting literature would predict that changes will occur over time in the regulatory skills that parents are targeting in their parenting attempts. Changes in responsive parenting among mothers of very-low birth weight children from 6 to 13 months include a slight linear increase in verbal scaffolding, labeling of objects, and redirecting of attention, as well as a rise and fall in attention maintenance during this period (Landry, Smith, & Swank, 2006). Though it remains unclear whether mother's structuring of children's emotion regulation increases or decreases over early childhood, there is ample evidence that the skills used for emotion regulation are developing dramatically during this period.

In thinking of parenting as a contingent behavior that adapts to children's growing skills and abilities, the toddlerhood and preschool periods should be a time of particular change in parent's ability to utilize their children's abilities in light of the dramatic developments which occur during this time in the domains of language, cognition, and inhibitory control. During the toddler and preschool period, children make impressive advances in their expressive language as they move from speaking their first words at around 19 months to a vocabulary of 700 to 800 words and the ability to speak in sentences by 36 months of age (Hart & Risley, 1999). The ability to discuss emotions and other mental states (e.g. thoughts and desires) emerges around age 2, and over the course of the preschool years children becomes children are known to more frequently use these mental state words in their conversations (Bretherton & Beeghly, 1982; Bretherton, Fritz, Zahn-Waxler, & Ridgeway, 1986). These language abilities may be particularly salient for children's ability to develop social and emotional competence during a point in childhood when they are learning to regulate and coordinate their emotions and behaviors (Brown, Donelan-McCall, & Dunn, 1996). Parents are also thought to play an

important role in helping to learn and use language more effectively by, for example, modeling words and sentences that refer to objects during play, or prompting children to imitate language that is more effective and appropriate to a situation (Hart & Risley, 1999). The emergence of these important linguistic developments during toddlerhood and the preschool years suggests that it could be a particularly salient for parents to structure their children's experiences using these growing language capacities.

During the early childhood period notable development has also been observed in children's attention capacities and in their ability to harness their attention in the service of their goals. Early in infancy children acquire the ability to shift their attention away from objects in order to limit their exposure to stimuli that are emotionally-arousing, though at this early stage such attention-shifting is thought to be reflexive and not representative of purposeful action on the part of the infant (Stifter & Moyer, 1991). Additionally, during infancy, children's ability to engage in shared or joint attention in social situations emerges and may provide important practice for the development of social cognition and understanding of the function of attention in goal-directed cognitions and behaviors (Mundy & Newell, 2007). Children's coordinated use of attention to negotiate between different response tendencies has been referred to as the executive attention system and is thought to be particularly important for children's self-regulation. Among the earliest evidence of this system appears in infancy when babies can control their attention by directing their eye-gaze in anticipation of an object's arrival at a future location (Sheese, Rothbart, Posner, White, & Fraundorf, 2008). Throughout the toddler and preschool years, more sophisticated components of this system come online including growing competence at selecting and controlling their attention in service of their goal-directed behaviors and self-regulation (Rueda, Posner, & Rothbart, 2005). Positive associations have been shown between successful

self-regulation and children's abilities to shift attention away from a distressing object and focus their attention on something other than the object of their distress through engaging in distraction (Gilliom, Shaw, Beck, Shonberg, & Lukon, 2002; Mischel, Shoda, & Rodriguez, 1989) and evidence further suggests that attention control in the preschool years may be important for later social competence and behavior problems (Belsky, Friedman, & Hsieh, 1998). Given the importance of attention in self-regulation during the preschool years and the advances that children display in their attentional capacities during this time, this is likely an important skill for parents to engage in when attempting to structure and support children's ability to self-regulate.

Additionally, important advances occur in a variety of cognitive domains during the preschool years, particularly in the ability to control thoughts and actions in the service of their goals. These future-oriented abilities, known as executive function, include some of the attentional control abilities described above, and also involve the ability to inhibit prepotent behaviors, and plan for the future (Welsh, Friedman, & Spieker, 2006). Research indicates that inhibitory control abilities that involve controlling a prepotent action emerge during the first year of life when children can first inhibit a response, such as reaching for an object in a previously reinforced location when they know that it has been moved to a new location (Diamond, 1990), and become more masterful at inhibiting their behaviors in increasingly complicated situations during the preschool years, with some evidence suggesting that a period of particular growth occurs in these abilities between 3 and 4 years old (Diamond & Taylor, 1996; Jones, Rothbart, & Posner, 2003). Future-oriented thinking, including the ability to organize actions with a future goal in mind, also occurs during the preschool years, with children showing rudimentary abilities to plan beginning around age 3 if they are tied to real-life events such as shopping for breakfast, and even more complex planning abilities if aided by parents in the task of plan development

(Hudson & Fivush, 1991). However, more masterful planning involving increasing complexity is thought to develop throughout the preschool years and not fully consolidate until children reach school age (Gardner & Rogoff, 1990; Welsh, Friedman, & Spieker, 2006). Zelazo & Cunningham (2007) suggest that executive function skills have important associations with the ability to regulate emotions, and relationships have been noted between children's self-regulatory abilities and both planfulness (Kopp, 1989) and inhibitory control (Carlson & Wang, 2007). Given the development of these cognitive skills over toddlerhood and the preschool years, parenting that is contingent on children's abilities would be expected to harness these skills as they emerge and develop throughout early childhood.

Another way that parents might change and adapt to a developing child is by changing the modalities they use to structure their children's self-regulatory efforts, e.g., strategic use of language, physical movement, or affect. While few studies have examined specific changes in parental structuring, there is some evidence that suggests that the form of parenting practices changes during early childhood. In one longitudinal study of parents' regulation of their infant's distress, Jahromi, Putnam, & Stifter (2004) noted a decline in parents' use of touching to soothe their child and an increase in their attempts at distraction as a regulatory technique. While the changes in cognitive development that occur during infancy are quite different from those developments that occur in the toddlerhood and preschool years, these findings support a model that describes parents as adapting their responses in light of their children's growing abilities. Similarly, Grolnick, Kurowski, McMenemy, Rivkin, & Bridges (1998) suggested changes in how mothers regulated their children's emotions across this period of development. Between the ages of 12 to 32 months of age, mothers less frequently used physical means of emotion regulation such as hugging and coddling. They also increased their use of verbal regulation

strategies from 12 to 18 months of age but decreased the frequency of this strategy thereafter. With regard to the use of parental affect as a purposeful tool for structuring a child's self-regulatory efforts, there is less evidence on parental affect as a strategy and how it might change over time. While we know little about its strategic use, parents' use of affect has been suggested to be an important element of parenting, with the general understanding that more positive and less negative emotions occur when parents interactions with their child are coordinated so that both parent and child are satisfied with the behaviors and outcomes that occur during the interaction (Dix, 199). That changes occur in parenting strategies used to guide children as they develop during infancy and the preschool years suggests an important need for exploration of the form parental strategies take as they engage their children's continually developing capacities in an effort to help their children self-regulate.

Study Aims and Hypotheses

The present study aimed to add to the extant literature on parenting and the development of children's self-regulation by delineating how parental structuring of child self-regulatory efforts changes over the course of the toddler and preschool years. Following the model put forth by Teti & Huang (2005), which asserts that competent parenting adapts to changes in children's abilities and skills, this study explored changes in mothers' structuring and developments in the child skills targeted and strategies used for structuring their children's self-regulation. Specifically, this study examined maternal structuring behavior of children's self-regulatory behavior at three time points: child ages 18, 24, and 36 months. The aims of the study were to describe:

(1) changes in the amount of structuring mothers provided during an age period when typically developing children are developing basic skills at initiating self-regulation,

(2) changes in the child skills mothers recruited in their structuring attempts (language, attentional control, inhibitory control, and planning) during this age period,

(3) changes in the strategies mothers used (affect, physical movement, and language) as they attempted to structure children's self-regulatory behaviors over time.

With regard to the first aim which explored changes in the frequency of maternal structuring behaviors over time, two plausible alternatives were hypothesized. In line with the idea that parents reduce their parental input to their children as they become more capable of regulating on their own, one plausible hypothesis would suggest that structuring should decline as children become more independent in their regulation. Supporting this hypothesis, parents were observed to reduce their soothing behavior over the course of infancy (Jahromi, Putnam, & Stifter, 2007). Alternately, the same study also provided evidence that mothers anticipate their children's skills, in that mothers were observed to encourage their infants' self-distraction even before this skill is known to come online in childhood. Based on this evidence, another plausible hypothesis would predict mothers' structuring behavior to increase over time as mothers foster the development and mastery of children's regulatory skills that are emerging during this time. Though this study does not directly examine growth in children's skills over the course of the study, based on the literature reviewed it is expected that growth occurred in many of the skills that mothers were targeting in their structuring attempts. Therefore, predictions about changes in maternal structuring behavior were developed with the extant literature related to children's development of self-regulatory skills in mind.

The second aim focused on changes in the frequency with which mothers targeted each child skill in their structuring attempts over the course of the study. For the second aim, mothers were predicted to increase their structuring of each of their children's regulatory skills over time

as their children's skills in these domains were thought to increase. Specifically, given children's burgeoning language acquisition between 18 and 36 months (Hart & Risley, 1999), mothers were expected to increasingly harness their children's language skills in their structuring attempts over time. Additionally, the growth of children's executive attention system over this age period and its importance for self-regulation (Rueda, Acosta, & Santojna, 2007; Rueda, Posner, & Rothbart, 2005) suggests that the skills of attention redirection, focusing, and distraction would be employed more frequently as these skills become available for mothers to draw upon in their structuring attempts. Furthermore, because it is known that children become increasingly able to devise future oriented-plans that could enable them to better tolerate being asked to wait (Hudson & Fivush, 1991), it was expected that mothers would increasingly encourage their children to use planning skills over the course of this study. Finally, because children become more masterful at inhibiting their thoughts and behaviors during the age period examined (Rueda, Posner, & Kieras, 2008), mothers were predicted to increase in their harnessing of their children's inhibitory control abilities over the time period investigated.

The third aim focuses on *how* mothers structure their children's skills in the service of self-regulation. Mothers were predicted to increase their use of language in structuring and subsequently decrease their reliance on physical forms of structuring as children are known to become more advanced communicators during the age range under investigation (Hart & Risley, 1999). It was predicted that parents' affective structuring strategies were likely to differ based on whether positive or negative affect was being conveyed. Based on the premise that the goals of parenting in infancy center around the formation of a positive parent-child relationship while goals in the preschool years shift towards setting limits and socializing children's behavior according to rules of conduct (Teti & Huang, 2005), positive affect should occur more frequently

when children are younger and should diminish over time. Conversely, negative affect may increase as parents are called upon more frequently to set limits and establish rules of conduct during a period where children are learning to behave in accordance with social standards (Kochanska, Coy, & Murray, 2001). Finally, although mother's use of physical methods of promoting child self-control is not often studied, it was reasonable to expect that mothers' use of this strategy would decline over time because children are likely increasing in their self-regulation and can increasingly use maternal verbal input as an environmental limit on their behavior.

Method

Participants

Data for this study will be obtained from a previously collected longitudinal data set known as the Development of Toddlers Study (D.O.T.S.; Cole, Crnic, & Blair, 2000) which investigated the development of emotion regulation and understanding in lower income, typically developing children aged 18 to 48 months old. Participants for this study and their families were recruited from a semi-rural Northeastern community by a number of methods including: birth announcements, community outreach including recruitment at community events and by community leaders, and by word-of-mouth through participants enrolled in the study. Interested families were contacted by phone and interviewed to determine fulfillment of inclusion and exclusion criteria. Families were included who fell within a range of income determined to represent economic strain but not poverty, defined as above the federally defined threshold of poverty but below the median national income based on family size applicable for each family. Included families had legal guardianship for at least 3 months of a child within the target age range for the study. Additionally, families were excluded if they were planning on moving in the

time frame of the study or if children had medical or psychological disorders or physical handicaps that would interfere with study administration.

From an initial sample of 128 families, 2 families did not meet financial criteria for eligibility, 5 families did not successfully complete the tasks at the first time point, and 1 child was significantly older than the target age at the time of the first laboratory visit. Additionally, one additional family was excluded because both parents were present during the task examined in this study, limiting the mother's opportunity to parent during this task. These withdrawn families did not differ significantly from the enrolled families on any of the demographic measures collected at the beginning of the study. Thus, the final sample consisted of 119 families (64 boys, 55 girls) who were on average 18.52 months old ($SD = .51$) at the initial 18 month visit. The age of children at each laboratory visit was within two weeks before or after the target age for each laboratory visit. At the 18 month first time point in the study, mothers were on average 30.45 years old ($SD = 5.29$). Based on demographic data of families collected at 18 months, the majority were white ($N = 113$; 94%) and the remaining families ($N = 7$; 5.8%) were African-American, Hispanic, or Asian ethnicities. The largest portion of children were first-born ($N = 54$; 45%), 38% ($N = 45$) were second-born, and 17% ($N = 21$) were at least the third-born child in their family. The average income of the households reported by families was \$40,655.70 ($SD = 14,996.17$) and the average household income per capita was \$11,009.49 ($SD = 4,534.17$). Most mothers in the study had at least some college or higher education ($N = 76$; 63%), 15.7% ($N = 19$) had some vocational training, and 19% ($N = 23$) had a high school education. The largest group of mothers reported that they worked full-time ($N = 47$; 39%), 32% ($N = 39$) worked part-time, and 28% ($N = 34$) were unemployed or described themselves as homemakers.

Procedures

From a larger battery of assessments, interviews, questionnaires addressing child and family characteristics, and observations conducted in the home and the laboratory included in D.O.T.S. investigation, the proposed study examines a laboratory-based parent-child interaction that took place when children were 18 months, 24 months, and 36 months old. For participation in these visits, children and their mothers visited the Child Study Center at The Pennsylvania State University. During the visits, children and mothers took part in several tasks that varied somewhat according to the age of the child but which included tasks that alternated between those that were designed to be emotionally challenging (e.g. frustrating, disappointing) and those that were not emotionally challenging. The task selected for this investigation took place at each of the time points in the study. During some tasks children interacted with research assistants and in others with their mothers, in which case mothers were informed of task procedures prior to the task and given written instructions to which they could refer throughout the tasks. Tasks took place in an observation room that contained a child-sized table with two chairs and a small adult-sized table and chair in the corner, as well as several developmentally-appropriate posters on the walls. Each laboratory visit was videotaped using a video-camera on the other side of a one-way mirror looking into the observation room. Videotapes were retained for later coding of child and mother behaviors. For the purposes of this investigation a task was selected to represent a naturalistic activity that parents and children might be likely to engage in at home. This task is described below.

Wordless Reading Task

Joint reading tasks have long been used to study children's language development and ability to formulate narratives (Bamberg, 1985), and have also been used as a context in which to

observe parental scaffolding behavior while interacting with young children (Reynolds & Evans, 2009). For the purposes of this study, the joint reading task was intended to reflect a common activity mothers and their children were likely to participate in at home, providing a naturalistic opportunity for the observation of parenting behaviors. Additionally, the nature of the task draws for children to employ a number of skills including attention, language, planning, and inhibitory control, in order to engage with their mother in reading a storybook. Given the importance of self-regulatory skills such as attention focusing and shifting for children's school readiness (Eisenberg, Valiente, & Eggum, 2010), the nature of this task afforded the opportunity to observe how mothers promoted several of these important skills. Mothers and children were led to a room containing a table and chairs and two wordless picture books. Mothers were instructed to read to their child for five minutes but told that it was acceptable if their child refused to read the books and that they need not force them to engage in the task. The books did not contain a written narrative but illustrated compelling stories involving children and animals and were generally engaging for the young children in the study.

Coding System

The videotaped data from the 18, 24, and 36 month reading tasks were coded the structuring coding system described below. Each videotaped interaction of the 5 minute task was divided into 15 second epochs and coded for the (1) presence of maternal structuring. If structuring was present, the structuring behavior was further coded for: (2) the child skill employed by the mother while structuring, and (3) the strategy used by the mother in the structuring attempt.

(1) *Presence of Structuring*

The presence of structuring was coded into three mutually exclusive categories to capture whether the mother attempted to structure the child: 3 indicated the mother employed the child's skills to engage him or her during the task, 2 indicated the mother used only directive commands such as "don't touch" or physically removing the prohibited toy from her child, without allowing the child to use his or her own regulatory skills, and 1 indicated no structuring or directing occurred.

(2) *Child Skills Mother Attempted to Harness during Structuring*

Every instance of structuring was coded to indicate which child skill the mother appeared to be harnessing in the service of self-regulation. The coders had six categories and used all that applied: *language*, *attention focusing*, *attention redirecting*, *distraction*, *planning*, and *inhibitory control*. As mothers may have targeted more than one skill in their attempt, it was possible for more than one child skill to be coded within a 15s epoch. For example a mother may have redirected a child's attention back to a book and within the same 15 seconds provided the child with a label for an emotion word displayed by a character in the book.

1. *Language* was coded when mothers attempted to recruit their children's language (expressive or receptive) skills. For instance a mother may have encouraged her child to repeat a word after she labeled an object in the story book, or asked the child to describe what was going on the story.
2. *Attention focusing* was coded when mothers attempted to encourage their children to focus or sustain attention on a task. For example, a mother may have attempted to keep the child's attention maintained on the storybook by pointing to the pictures or using an excited tone of voice to capture the child's attention.

3. *Attention redirecting* was coded when mothers attempted to recruit their child's ability to shift attention back to an activity. For example, a child may have become disinterested in the story book and the mother redirected the child's attention to the book.
4. *Distraction* was coded when mothers attempted to recruit their child's ability to shift attention away from an undesirable activity. For example, the mother may invite the child to sing the alphabet or discuss posters in the room if the child lost interest in the storybook.
5. *Planning* was coded when mothers attempted to recruit their child's ability to think about events in the future. For example, the mother may have encouraged the child to think about what was coming next in the story or suggested the child look at the wall posters after the story is finished.
6. *Inhibitory control* was coded when mothers attempted to recruit the child's ability to stop action. For instance, if a child lost interest in the story, a mother may have reminded her child to stay in the room or encouraged the child to stop climbing on the furniture in the room. An important distinction was made between mother's structuring of inhibitory control and her use of directives, e.g., don't touch. To be coded as structuring of inhibitory control, a mother must have given the child opportunity to use his or own inhibitory control abilities as opposed to simply telling a child what to do or not do. The mother must have helped the child know how to stop action.

(3) *Modalities Mothers Used when Attempting to Structure*

If structuring occurred during the epoch, the modality of communication that mothers used in their structuring attempt was considered using three categories: use of *affect*, *physical movement*, and *language*. These three strategies were not mutually exclusive and could be double coded if mothers used more than one strategy within one 15 second epoch. For instance a mother physically moved a child closer while excitedly encouraging the child to look at the storybook, or if a mother asked her child how the crying boy was feeling in a sad tone of voice.

1. Mothers' use of *affect* was coded when mothers employed affective facial expressions or vocal tone in their structuring attempts, for example using an excited tone of voice when describing the characters in the picture book.
Whether the affect used by the parent was positive or negative was also coded.
2. Maternal use of *physical movement* to structure was coded when mothers used physical space or bodily movement in their structuring attempts, such as seating the child in her lap so he or she can better attend to the book, or pointing to the pictures as she read the story.
3. Finally, maternal use of *language* was coded when mothers used language in their structuring attempts, for instance if a mother asked her child a question about the story, or encouraged her child to imitate a word or corrected the grammatical formation of a sentence.

Coding Training and Reliability Procedures

Each coder was required to achieve a criterion of 80% accuracy with a master video before beginning to code independently. Throughout the coding period, weekly meetings were held with new coders to discuss their work, review difficult videotapes and resolve issues not

clearly handled through the coding manual. Finally, 18% of the videos were used to estimate inter-rater reliability. Coders were unaware of which video were reliability cases. For categorical decisions, kappa were be used to estimate reliability. For ratings, intraclass correlations were used. The reliability statistics for each of the study variables are presented in Table 1. Kappa for structuring behavior overall was 0.80. For child skills harnessed during the structuring attempt, kappas ranged from 0.57 to 0.91. Two child skills harnessed, distracting and inhibiting, had kappa values below 0.7, likely due to the low frequency of these two behaviors, and percent agreement between coders' ratings for each skill was higher than 95%. For maternal strategies used to structure, interclass correlations revealed that coders ratings were highly correlated ($ICC = 0.80, p <.01$).

For the purpose of analyses, frequency variables were created for each of the structuring variables included in the coding system. Structuring frequency was defined as the number of epochs in which structuring behavior occurred during the 20 epoch task. Similarly, frequency variables were calculated each of the child skills mothers attempted to harness while structuring (e.g., child's attention focusing, language, planning, etc.), each defined by the number of epochs in which each skill was structured by mothers during the task. Finally, variables were created representing the amount of each strategy used by mothers to convey their structuring, defined as the sum of the ratings (0-2) of each strategy across the 20 epochs of the task.

Results

Overview of Analyses

Before addressing the study aims, preliminary steps included assessment of missing data, and examination of the descriptive statistics for each of the variables coded (overall structuring, child skills structured, and mother's strategies used in structuring), including the zero order

correlations between study variables. Following these initial analyses, growth curve modeling (SAS version 9.2 PROC MIXED) was conducted to address each aim of the study.

The study's first aim was to describe changes in the *amount* of structuring mothers engage in over the course of early childhood. In order to establish whether there are changes in structuring frequency, individual growth curve analyses were used to examine linear growth of structuring behavior over the time frame examined. This analysis explored whether structuring behavior increased, decreased, or was stable over time.

The second aim of the study was to document developmental changes in the child skills mothers attempted to harness in their structuring attempts. Again, separate individual linear growth curve models were tested for each child skill structured by mothers using frequency variables representing the number of epochs out of twenty total epochs that each skill was harnessed by mothers in their structuring attempts. Specifically, these analyses determined whether each child skill was harnessed at an increasing, decreasing, or stable rate over time.

To examine the third aim, namely, whether the strategies used by mothers in their structuring attempts changed over time, linear growth curve models were tested separately for each of the structuring strategies (positive and negative emotion, physical movement, and language). As before, these models were tested using a variable representing the overall use of each strategy over the course of twenty epochs (sum of 0-2 ratings coded during each epoch). These analyses explored whether mothers' use of each strategy increased, decreased, or remained constant across the time points under examination.

Missing Data

Of the 119 mothers who were not excluded or dropped from the study for the reasons described above, all mothers were observed on at least two of the three possible occasions. At

the first time point (child age 18 months), two mothers did not complete the task, all mothers completed the task at the second time point (child age 24 months), and four mothers did not complete the task at the third time point (child age 36 months). Reasons for missing data included children becoming too distressed to continue with a visit and families missing the laboratory visit altogether at a given time point.

Descriptive Statistics

The first phase of analysis examined descriptive statistics of each of the variables in the study. Descriptive information for all of the study variables are presented in Table 1. These results indicated that structuring occurred in nearly every epoch at every age (M frequency ranged from 18.85 to 19.18 epochs out of a possible 20). Frequencies for child skill harnessed and structuring strategy used by mothers were variable, with some skills and strategies used frequently (e.g., attention focusing, positive emotion) and others rarely (e.g., inhibiting, negative emotion). Intercorrelations among the frequency of child skills harnessed, amount of each maternal structuring strategy used, and between child skills harnessed and maternal strategy used are presented in Tables 2, 3, and 4, respectively.

Multi-level modeling (MLM) procedures were used to examine growth curve models for each study variable of interest using SAS version 9.2 (PROC MIXED). For each of the growth curve models tested, time was centered at the first time point of the study (18 months) for ease of interpretation of the intercept parameters of the models. For each variable, a model was tested to explore linear growth according to the following equation:

$$\text{VarInterest}_{i} = \beta_{0i} + \beta_{1i} (\text{time}_{i}) + e_{i}$$

$$\beta_{0i} = \mu_{00} + e_{0i}$$

$$\beta_{1i} = \mu_{10} + e_{1i}$$

where “VarInterest” represents the study variable being modeled in each analysis. Parameter estimates for the variable β_{oi} indicate the amount of the variable of interest at the outset of the study (18 months), and the estimates for β_{1i} indicate the amount of change in the variable of interest per month of child age. Results from the multilevel models for structuring, child skills harnessed, and strategies used by mothers to carry out their structuring attempts are summarized in Table 5.

Study Aim 1 Results

To test the presence of change in the overall frequency of maternal structuring attempts, growth curve modeling was used to determine the linear growth of maternal structuring over time. Results of the model revealed that structuring occurred at a high level at the outset of the study (intercept parameter estimate = 18.96, $p < .01$) and that there was no statistically significant change in the amount of structuring mothers engaged in between child ages 18 and 36 months (linear slope estimate = 0.01, $p = .49$). These results indicated that maternal structuring in the context of a reading task occurred at a high and stable rate between child ages 18 and 36 months old. These results therefore did not support the prediction that the amount of structuring mothers engaged in would change over the course of the study.

Study Aim 2 Results: Child Skills Harnessed

To test the presence of changes in which child skills mothers attempted to harness, six separate growth curve models were conducted. Results for each child skill are presented separately below, and are depicted in Figures 1 and 2.

Attention Focusing. Results of the linear growth model of change in mothers harnessing of attention focusing revealed that mothers targeted this skill approximately three fourths of the time at the beginning of the study (intercept parameter estimate = 15.28, $p < .01$) and increased

over time (linear slope estimate = 0.10, $p < .01$). These results indicated that mothers used a high level of structuring attention focusing in the reading task and, as predicted, this target of structuring increased between child ages 18 and 36 months.

Attention Redirecting. Results of the linear growth model of change in mothers harnessing of her child's ability to redirect attention revealed that mothers targeted this skill approximately one quarter of the time at the beginning of the study (intercept parameter estimate = 5.72, $p < .01$) and that this target of structuring decreased over time (linear slope estimate = - 0.27, $p < .01$). These results indicated that targeting children's ability to redirect attention occurred periodically in the reading task and decreased over the period between child ages 18 and 36 months. These results were inconsistent with the prediction that mothers would increase in their harnessing of their children's attention redirection over time.

Distracting. Results of the linear growth model of change in mothers harnessing of a child's ability to engage in distraction revealed that this skill was infrequently targeted at the outset of the study, as might be expected given the nature of the task (intercept parameter estimate = 0.33, $p < .01$). In addition, the rate of structuring this skill was stable over the course of the study (linear slope estimate = 0.00, $p = .82$). These results indicated that mothers did not often target their children's ability to distract in their structuring and this was consistent over time between child ages 18 and 36 months, contrary to the prediction that harnessing of this skill would increase.

Planning. Results of the linear growth model of change in mothers harnessing of planning revealed that mothers also targeted this skill at a low rate at the beginning of the study (intercept parameter estimate = 0.33, $p < .01$). However, mothers increasingly targeted planning skills, albeit at a very small rate, between child ages 18 and 36 months (linear slope estimate =

0.02, $p < .01$). As predicted, these results indicated that mothers increasingly targeted their children's planning skills in their structuring attempts between the time their children were 18 and 36 months but that this form of structuring occurred relatively infrequently and the change in this form of structuring was minimal if significant.

Child language. Results of the linear growth model of change in mothers harnessing of their children's language revealed that mothers targeted this skill approximately half of the time at the beginning of the study (intercept parameter estimate = 10.47, $p < .01$) and that their targeting of this skill increased by a small amount over time (linear slope estimate = 0.08, $p < .01$). As predicted, these results indicated that mothers increasingly targeted their children's language skills in their structuring attempts between child ages 18 and 36 months but that this skill increased by a small amount over the course of the study.

Inhibitory control. Results of the linear growth model of change in mothers harnessing of inhibitory control revealed that mothers targeted this skill at a low rate at the beginning of the study (intercept parameter estimate = 0.17, $p < .01$) and that the amount of structuring of this skill remained stable over time (linear slope estimate = 0.01, $p = .18$). These results indicated that mothers harnessed their children's inhibitory abilities very rarely during the task and, contrary to the prediction that harnessing of this skill would increase, mothers did not show any change in their rate of structuring this skill over the course of the study's time frame.

Study Aim 3 Results: Maternal Structuring Strategies

To test the presence of change in the ways that mothers engaged in structuring over time, linear growth curve models were tested separately for each strategy: positive emotion, negative emotion, language, and physical movement. The findings for the modeling of each strategy are presented below and are depicted in Figure 3.

Positive Emotion. Results of the linear growth model of change in mothers use of positive emotion during structuring revealed that mothers used this strategy a moderate rate at the beginning of the study (intercept parameter estimate = 20.33, $p < .01$). Moreover, mothers increasingly used positive affect over time (linear slope estimate = 0.14, $p < .01$). Contrary to prediction that mothers' use of positive emotion would decline with age, these results indicated that mothers frequently used positive emotion from the outset of this task and increased its use between the time their children were 18 and 36 months old.

Negative Emotion. Results of the linear growth model of change in mothers' use of negative emotion during structuring indicated that, at the outset of the study, mothers infrequently used their negative affect to structure child self-regulation (intercept parameter estimate = 1.52, $p < .01$). Moreover, the infrequent strategy declined over time at a low rate (linear slope estimate = -0.03, $p < .05$). These results indicated that mothers seldom used negative affect in their structuring attempts, and that their use of negativity in their structuring declined although minimally between the time their children were 18 and 36 months. These results were contrary to the prediction that mothers would increasingly use their negative emotion in structuring over the course of the study.

Mother's Language. Results of the linear growth model of change in mothers used their own language to structure child self-regulation at a moderate rate at the beginning of the study (intercept parameter estimate = 17.86, $p < .01$). Moreover, their use of this strategy increased over time (linear slope estimate = 0.18, $p < .01$). These results indicated that mothers used a moderate amount of language from the outset of this task and, as predicted, increased in their use of their language to structure, albeit relatively slightly, between child ages 18 and 36 months.

Physical Movement. Results of the linear growth model showed that mothers used a moderate amount of physical movement to structure their children's self-regulation, at the beginning of the study (intercept parameter estimate = 22.26, $p < .01$). Moreover, mothers' use of physical movement decreased over time (linear slope estimate = -0.44, $p < .01$). These results indicated that mothers used a moderate amount physical movement when their children were 18 months of age and that this strategy declined with between child ages 18 and 36 months, as was predicted.

Discussion

The goal of the present study was to examine changes in parenting associated with mothers attempting to structure young children's self-regulatory skills during an age period when there are marked changes in children's ability to self regulate. The study examined child age-related patterns in the overall frequency of structuring as well as in the child skills mothers targeted and in the strategies mother used to structure those child skills. Based on the view that parents *adapt* to children's developmental changes, it was predicted that the overall frequency of maternal structuring would increase as children moved from toddlerhood to preschool age. Similarly, because growth in all of the skills included in this study has been documented in children in the toddler and preschool years, it was predicted that mothers would increase in their efforts to harness each of the child skills examined. However, the strategies mothers used to structure those skills were expected to change, based on previous research examining parenting strategies and hypothesized trajectories based on the assumption that parents would adapt to children during this period of child development.

The results provided partial support for the predictions. First, contrary to prediction, there were no changes in the overall amount of structuring. However, the overall amount of

structuring may have masked more specific changes in the nature of parental structuring. Indeed, longitudinal changes were revealed in the extent to which each child skill was harnessed and in amount of each strategy mothers used to structure. In some cases, these changes were more marked (e.g., harnessing of attention redirection and mothers' use of physical movement) than in other cases for which there were small but significant changes (e.g., harnessing of planning skills) or there were no changes. Discussion of these findings highlights these varied patterns of change, focusing first on the targeted skills and then on the ways in which mothers used their own emotion, movement, and language (i.e. strategies). Furthermore, the results are discussed within the context of the parenting literature and children's development of self-regulation.

Discussion of Aim 1: Changes in Structuring Frequency

It is noteworthy that the pattern of change seen in the amount of overall structuring behavior did not support either of two alternate hypotheses proposed. When examining structuring at this overall level, the findings suggest continuity over the period of early childhood. The high and stable rates of structuring indicated that, regardless of their children's age, which was regarded as a marker for child developmental change, mothers attempted to engage their children's skills at self-regulation during the wordless reading task at every age to the same extent. However, the focus on overall amount may mask qualitative changes in the nature of structuring that may reflect adaptation to changes in the child.

The fact that parents structured throughout the joint reading task at each time point examined suggests that parental structuring is a commonplace behavior for mothers of young children, at least in the context of the single task examined in this study. Parents appear to have many opportunities to encourage their children to practice regulatory skills during common parent-child activities such as reading a story together. However, it may be that this high and

stable rate of parental structuring is somewhat task-specific, and different rates would be found if a task was (a) less interpersonally engaging for mothers and children or (b) more readily achieved by the child by the later age points. It may be that the small magnitude of changes observed in this study has to do with the fact that one would not expect toddler and preschool aged children to change much in the way they interact with mothers during a wordless reading task over the two years examined. Both 18 and 36 months olds have limited experience with reading, and thus may have engaged in similar ways with their mothers over the course of the study. Despite these qualifications, the ability of this study to detect parental adaptations even within this somewhat constrained task suggests that parents likely do change in important ways, and that the findings would likely be robust if changes in structuring were examined within a wider range of parenting contexts.

Additionally, when drawing conclusions regarding the stability of maternal structuring, these results are limited to the specific developmental time frame examined in this study. It is important to recognize also that though structuring frequency was stable during this limited time frame, developmental changes could have occurred earlier or may occur as children continue to develop. Examination of maternal structuring between 12 and 24 months of age, for example, may have revealed more dramatic changes in the context of this task, as prelinguistic children learn their first words and increase their vocabulary dramatically (Hart & Risley, 1999). Similarly, mothers' structuring behaviors might have looked very different had the study followed them past school entry, when they would have been more familiar with book reading.

The finding that structuring was stable over time contrary to two competing hypotheses is an appropriate reflection of the mixed literature regarding parental change. Teti and Huang (2005) describe a highly confused array of findings of both continuity and discontinuity among

those who have studied constructs such as sensitivity or responsiveness over time. The authors note that inconsistency in the way constructs are measured over time and researchers' failure to take into account ways that a parental behavior may be expressed differently when children are of different ages likely hinders our current understanding of parental change. The present study represents the use of what Teti and Huang (2005) refer to as a developmental emic approach to the study of parenting behavior, meaning that measurement of the construct of structuring took into account qualitative changes over time. Such an approach allowed maternal structuring behavior to be understood on multiple levels--when examined at a higher-order level, structuring remained stable throughout the study, yet on another level parents' structuring behavior over time appeared very different. Though the level of structuring overall remained stable over time, this stability masked changes in parenting behaviors that were related to growth in specific child skills during the course of the study.

Discussion of Study Aim 2: Changes in Child Skills Harnessed

Though changes were found in mothers' harnessing of several child skills, the most prominent trends occurred in mothers' attempts to focus their children's attention and harness their language abilities. All but one of the child skills harnessed showed statistically significant patterns of change, however, the majority of these changes were modest in magnitude. The most marked change was mothers' decrease in the degree to which they harnessed their children's attention redirection skills. The small magnitude of these changes suggest that parental adaptation in terms of the frequency that a mother harnesses a particular skill occurs at a slow rate for most child skills targeted, at least for the task examined in this study and for parents of children during the age frame examined in the present study. Nonetheless, within these modest

trajectories of change, interesting results emerged with regard to mothers' targeting of their children's attentional focusing and redirecting skills as well as their language abilities.

Analyses of the trajectories of change in mothers' harnessing of their children's attentional skills revealed that mothers showed a moderate decrease in the rate at which they harnessed their children's attention redirecting skills, and a modest increase in their harnessing of their children's ability to sustain their attention. These findings are consistent with the literature on the development of attention in early childhood. The rapid development of the executive attention system during the third year of a child's life (Rueda, Posner, & Rothbart, 2005) provides a useful framework for understanding the divergent but complementary patterns of change in mothers' targeting of these skills. That mothers in this study attempted early on to harness their children's attention redirection skills coincides with a body of research that has documented evidence that parents of infants work to help them build their skill at shifting their attention as this skill develops during the first year of life (Stifter & Moyer, 1991; Landry, Smith, & Swank, 2006). Similarly, the increases noted here in mothers' frequency of harnessing attention focusing, matches the theory that children's ability to control their attention, i.e. executive attention, emerges in the third year (Rueda, Posner, & Rothbart, 2005), which may provide mothers with more opportunities to harness this skill in the service of self-regulation. In fact, observations of young children's self-regulation suggest a change in the latency and duration of children's ability to shift their attention away from a restricted desirable object and toward appropriate play (Cole et al., 2011). Indeed, it is known the literature that both attention skills and negative emotionality contribute unique variance in predicting the later development of behavior problems in early childhood (Lawson & Ruff, 2004). Though the present study did not assess child skills directly, the age-related changes in maternal structuring are consistent with the

view that changes in the child's skills contributes to changes in how mothers structure. Future research should consider the bidirectional influences of how parenting contributes to the child's development of attention control in the context of self-regulation and how changes in child self-regulation influence changes in parental structuring.

Taken together, the combination of changes in mothers' targeting of attention redirection and focusing suggests that mothers may show compensatory shifts in their targeting of one skill as opposed to another, during a time period when the attention system as a whole is thought to develop. The diverging trajectories of attention redirection and focusing targeting by mothers suggests that, during a time when children's attention systems become more sophisticated and children's capacities for sustained attention strengthen, mothers are adapting to this development and shifting the targets of their parental support in ways responsive to their children's development. Though the growth curve analyses used to model each of the child skills in this study were independent and cannot speak to relationships among different child skills harnessed, significant concurred negative relationships between the frequency of mothers' targeting attention redirection and focusing at each age point to the compensatory relationship between mothers' targeting of these skills.

Mothers actively attempted to engage their children's language skills at all child age points and these efforts also increased over time. While changes in the extent to which mothers' engage their children's language development in service of self-regulation has not been a primary focus of much of the extant literature in this area, the increase in mothers' efforts to stimulate their young children's language in skills like focusing and sustaining attention seems to parallel developmental change in children's language skills. As early as child age 18 months, mothers were seen to harness their children's language at a moderately high rate, and they

increased their efforts to target this skill over the course of the child's early years, albeit at a modest rate of change. The high frequency with which mothers attempted to engage their children's language at the first time point, age 18 months, was unsurprising given that children are just beginning to use words and build their vocabularies at this age (Hart & Risley, 1999). However, whereas, Hart and Risley (1999) noted that parental language input declines drastically once children learn to talk, the present findings showed that mothers increased in their targeting of child language in the context of the wordless reading task. Although decreases in parental linguistic input may occur in the course of many daily routines, in a pre-reading activity in which children are encouraged to engage with their mothers in story-telling, mothers may increase in their targeting of child language skills in concert with the growth in child language. That is, the modest growth in the amount that mothers targeted this skill over time suggests that they may be continuing to capitalize on their children's language development in the context of reading, which is known to increase in sophistication and complexity during the preschool years (Robinson & Mervis, 1998). Though little is known about how children use language to scaffold their own self-regulation, evidence suggests that there is a relation between toddler language and later use of certain self-regulatory skills (Pemberton et. al., under review). Mothers who are increasingly focusing their structuring attempts on their children's language skills may be doing so in an effort to help them to use their language *functionally* (Cole, Armstrong, & Pemberton, 2010). In this task, mothers who helped their children use more elaborate language to become engrossed in "reading" the wordless story supported their children's ability to accomplish the overall goal of sustaining their attention on the desired activity for the duration of the task.

The low occurrence and lack of meaningful developmental change in mothers' structuring of child distraction, planning, and inhibiting highlight the limitations imposed by

observing parental behavior in only one task and within a limited time frame. Though the reading task used in this study highlighted interesting changes in mothers' structuring of children's attention and language skills, the mutually enjoyable nature of reading a story together did not pull for two skills important for children's development of emotion regulation: distraction and inhibition. Similarly, mothers rarely encouraged their children to use their planning skills in this study, though it cannot be known whether this was due to the nature of the task or the fact that children even at the oldest age point examined in this study have a highly limited understanding of future orientation (Hudson & Fivush, 1991).

Discussion of Study Aim 3: Changes in Mothers' Structuring Strategies

Small to moderate shifts in the frequency of the strategies mothers used to structure their young children's skills emerged in this study. While growth models for all four strategies were statistically significant, results reflecting changes in mothers' use of their physical movement during this period were the most meaningful, and patterns of change in mothers' use of negative emotion were effectively trivial. Taken together, the patterns of change in several maternal structuring strategies suggested that the appearance of parental structuring may be noticeably different for a toddler and a preschool child. Specifically, mothers were observed to decrease in their use of physical movement and negative emotion, but increase in their use of language and positive emotion in the course of their structuring attempts.

Though little research has examined mothers' use of physical movement in parenting, the predicted decrease in their use of this strategy as their children grew older is consistent with other studies. Studies of physical forms of parenting have primarily focused on infancy and toddlerhood, a period where mothers have been found to sooth their children who have limited self-regulatory capacities (Jahromi & Stifter, 2007). In this case, parental soothing of their

infants represents one way in which parents are known to use their physical movement to provide parental input in support of their children's regulation. In the context of the wordless reading task, over time mothers likely had to expend less physical effort to keep their children occupied with the story. When children are 18 months old, a mother may be more likely to encounter a situation where picking a child up or redirecting attention visually is necessary to keep children engaged in the story than at later ages when children are better able to sit and read for the full five minutes. Decreases in mothers' physicality in structuring can also be understood in relation to research on children's compliance with maternal requests, which shows a developmental progression in compliance from toddlerhood to the preschool years (Kochanska, Coy, & Murray, 2001). This research suggests that toddlers are most likely to comply under direct supervision from their mothers, while in the preschool years they can increasingly internalize commands and comply without the direct involvement of their mothers. It follows that mothers may be more likely to use more physical forms of parental input (e.g., pointing or physically prompting) in early childhood before their children become more autonomous in their behavior and do not require the presence of their parents to comply with parental requests. Changes in mothers' use of physical strategies over time, then, likely reflect adaptations to children's increasing ability to independently regulate their behaviors and emotions, as they become less physically interconnected with their mothers over time.

Furthermore, physical forms of parenting may interact dynamically both with other strategies and in concert with changes in the child skills harnessed over time. It is likely that as parents are increasingly able to communicate their needs, suggestions, and encouragement to their children through their words, the necessity of showing children with their physical body decreases. Some evidence for this assertion can be drawn from zero-order correlations among

maternal strategies used, which revealed that mothers use of language and physical movement to structure were not significantly correlated when children were 24 months old, but mothers' use of physical movement at this time point was significantly positively related with their use of their language when children were 36 months old. Additionally, the known improvement of children's attentional capacities during the age period investigated (Rueda, Posner, & Rothbart, 2005) likely reduces the need for mothers to physically redirect their children's attention back to a task, as children are better able to maintain their attention for a prolonged period of time on a task. Indeed, supportive evidence can be drawn from developmental examinations of children's emotion regulatory strategies, which suggests that children improve in their ability to sustain distraction when their goals for a desired object are blocked, notably between the toddler and preschool years (Cole et al., 2011). When parents are in the room with children, their increasing ability to communicate verbally with their children in more sophisticated and engaging ways may represent an important support for children attempting to remain on task and focused on the joint reading task for the duration of the task.

As predicted, mothers were observed to increase their use of their own language in their structuring attempts over the child age period studied, albeit at a modest rate of change. The emergence and growth in children's linguistic capacity during early childhood (Hart & Risley, 2005) offers a useful explanation for why mothers in this study were increasingly likely to use their own language to communicate their structuring to their child. As children's linguistic skills are increasing both in terms of their receptive ability to understand what is being said by a helpful parent and in terms of their ability to engage with the parent in more elaborated interactions, it seems intuitive that mothers would capitalize on this skill by using their language to engage more with their child during daily interactions.

Contrary to the prediction that it would decline, mothers' use of their positive emotion increased over time. This finding may be understood within the framework of the broader parental emotion literature and in light of developmental changes in children's regulatory behaviors. It is known that over the course of early childhood, as children become better able to regulate their emotions and behaviors, children's amount of expressed negativity in a variety of situations declines (Murphy et al., 1999). This decrease in maternal negativity expressed by parents during interactions with their children may shed light on the use of parental positivity seen in this task over time. It is probable that increasing abilities of children in the present study to self-regulate allowed them to engage for longer periods of time, making the experience of participating in the joint story task a more enjoyable task for both parents and children. As parents showed a decreasing need to redirect their children's attention back to the book, they may have found it easier to incorporate positive emotion in their efforts to help their children sustain their attention, such as by using a sing-song voice to maintain children's attention to the story. Though a review of the literature tells us about parents' affective exchanges with children in general, to date little has been known about how parents use their affect purposefully in the context of parenting, and the present study suggests that mothers' positive emotion may be a useful tool for engaging a child's growing regulatory capacities.

In sum, these findings also suggest another important way that parents adapt their behavior towards their young children over time, specifically by changing the means by which they deliver their structuring attempts during interactions with their children. It is important to note that though significant, the magnitude of changes in mothers' use of strategies over time was relatively small. Therefore, the impact of these adaptations on children's acquisition of self-regulatory skills cannot be inferred from the present study. Rather, these small changes merely

offer promising evidence that examination of parental behavior within a longitudinal context could be a useful endeavor and, if further explored, may help researchers better understand how parents support their children's regulatory development.

Discussion of Parenting Methodology

The present study contributes to the literature on parenting, by considering specific changes in parenting behavior as a function of the child's age and a specific goal—the development of child self-regulation. Though little attention has been paid to longitudinal changes in parenting, the majority of work considering parenting changes has focused on continuity and discontinuity in a global parenting quality, such as sensitivity or responsiveness (Teti & Huang, 2005). Recent years have brought an increase in efforts to deconstruct global parenting constructs in order to more adequately specify parenting behaviors that are targets of intervention (e.g., Guttentag, Pedrosa-Josic, Landry, Smith, & Swank, 2006). Nonetheless, the modal approach to studying parenting in the literature is to conceptualize it as a discrete and unitary behavior that can be classified using such terms as “positive” or “sensitive” and, when it is considered within a longitudinal framework, often limited to whether a parental quality is “more” or “less” present (Baker et al., 2011). The varied patterns of change in the child skills harnessed and modes of delivery used by mothers in the present study, despite the stability of overall structuring behavior during this age period, highlight the value of conceptualizing parenting as an adaptation to developmental changes in children.

The different patterns of change among the child skills examined here as targets for parental structuring call into question the approach commonly adopted by researchers that treats structuring and similar constructs as cohesive, unitary behaviors (e.g., Biringen, 2000; Lengua, Honorado, & Bush, 2006). Examination of changes in the targeted skills examined in this study

suggests that it is not sufficient to measure simply whether or not, or how much, a parent is structuring their children's regulatory development. Rather, meaningful patterns emerge from these data that highlight how parents are adapting their behavior to support specific developing skills and abilities of their children during what is known to be a critical period of growth in a number of cognitive domains including attention, language, and executive functioning (Carlson & Wang, 2007; Hart & Risley, 1999; Rueda, Posner, & Rothbart, 2005). Further examination of changes within specific skills and consideration of how these developments may interact would provide additional understanding of how parents support their children's development of self-regulation.

In sum, the results of the present study offer preliminary evidence that parents adapt their parental behavior to their developing children during early childhood. As with many domains of research in psychology, the nature of this adaptation is highly nuanced and complex, but reveals useful information for those interested in unpacking parents' contribution to their children's self-regulatory development. In their seminal chapter, Teti & Huang (2005) suggest that an important task for researchers undertaking the study of parenting behavior is to adopt a developmental emic approach to research that acknowledges that competent parenting changes qualitatively over time, and should not be assumed to generalize across a child's lifespan. Indeed, this study shows that not only that utilizing that approach may better capture the nature of parental change, but that unpacking the elements of those qualitative differences offers researchers useful clues to how parents support children's growth in a variety of domains in early childhood.

Limitations

As with any research study, several limitations hamper the ability to draw conclusions with certainty from this initial study of parental structuring and its adaptation as a function of child age. The selection of the time frame investigated in this study was conscientious and thoughtful, but still reflects only a small portion of the important changes parenting likely undergo during their children's development. It is likely that parents continue to adapt their parenting behavior, targets of their efforts, and the strategies used to communicate with their children throughout the course of their lives, even into adulthood. Additionally, by the time a child is 18 months old, parents have likely undergone numerous important changes in the means by which they respond to and scaffold their children's emerging skills and abilities. Nonetheless, this study sought to capture an important time characterized by rapid changes in many skills known to be critical to the development of self-regulatory skills (Kopp, 1982; Rothbart, Posner, & Kieras, 2008). Understanding how these abilities are supported by parents during this stage of life is important given the significance of developing these regulatory capacities for a myriad of outcomes including development of psychopathology (Cole, Michel, & Teti, 1994), school readiness and achievement (Belsky, Friedman, & Hsieh, 2004), and social competence (Eisenberg et al., 1995).

Additional limitations of the study include the sole focus on mothers, the lack of attention to potential child gender differences, and the use of an economically strained sample whose patterns may not be generalizable to mothers at other economic strata. Increasing evidence suggests that fathers may be important contributors to children's successful development (Amato, 1994). With the trend of increasing involvement of fathers in the upbringing of young children (Parke, 2004), understanding whether their trajectories of change in parental structuring

behavior are similar to mothers or may have unique characteristics would help paint a more comprehensive picture of this important parenting behavior. Additionally, research suggests that boys and girls may have different trajectories of self-regulatory development during early childhood (Vallotton & Ayoub, 2011), which may lead to differences in trajectories of change for parents of boys and girls. Because gender differences were not examined as an aspect of this study, the impact of gender differences on the results is not known. Furthermore, this study represents a relatively unique sample of semi-rural mothers, and who, in some respects are relatively high functioning. The majority of the sample, for example, had at least a college education or higher. Though the sample was consciously selected to represent families with a lower income than the national mean in an effort to increase variability of several variables of interest (e.g., language ability), the question remains as to whether the results of this study would be generalizable to a different population, such as parents residing in a non-Western culture or in an urban setting.

Additionally, this study was limited by the use of only one task, though the task selected offered an interesting opportunity to observe many of the skills known to be important to the development of self-regulation. In fact, given the importance of self-regulatory skills including attention focusing and shifting for children's academic success (Eisenberg, Valiente, & Eggum, 2010), this task may have been particularly useful for furthering our understanding of parental adaptation in light of developments in the executive attention system during the age period examined (Rueda, Posner, & Rothbart, 2005). Moreover, while observational data may represent an improvement over studies that rely solely on self- or maternal-report of parenting behaviors, the use of a single task for observation inherently limits the ability of results to generalize to maternal behavior exhibited in a different setting and involving a different set of environmental

circumstances or parenting goals. Though the story read by mothers and their children offered a number of emotional events which parents and children could relate to, the pleasant nature of the task for children limited the ability to observe some of the regulatory behaviors that are most likely to emerge when children are emotionally challenged, including distraction away from a source of distress and inhibitory control. However, the use of this task offered several positive aspects for observing maternal parenting behavior as well. These included the naturalistic quality of the task that is similar to activities parents and children regularly engage in at home and the ability to pull for children's attentional and language abilities.

Finally, the limited time-frame of the study limited the degree to which advanced growth curve modeling techniques could explore nuanced changes in parental behavior that may not fit a strictly linear trajectory of growth. Examination of parental change over a longer time course or with more frequent observations within the same time frame might have highlighted interesting patterns of acceleration or deceleration of change over time. Nonetheless, given the dearth of literature on longitudinal change in parenting (in particular with respect to the way that a particular parenting behavior may be expressed differently over time), this study represents an important addition to the parenting literature, even by offering a preliminary picture of what is a more nuanced story.

Future Directions

Though understanding how parents adapt their behavior represents an important first step, a critical next stage of this line of research must explore how parents adapt their behavior in such a way that contributes meaningfully to children's positive developmental outcomes. If beneficial and maladaptive patterns of profiles of parental adaptation could be identified, for example, such information could contribute to the development of new parenting interventions that teach

parents to modify their behavior in relation to their children. Already, researchers are beginning to recognize that it is important to consider the optimal timing of responsive parenting interventions for achieving the most change in children's social and communicative skill development (Landry, Smith, Swank, & Guttentag, 2008). Understanding when and how parents can adapt their parental behaviors to best support their children's development of self-regulatory skills holds much potential for researchers who study these skills in terms of their risk for suboptimal outcomes, such as the development of psychopathology.

Taken together, the results of this study reinforce the view that parenting research will benefit from studying specific parenting behaviors in a developmental context. Furthermore, this study suggests that the overall frequency of a behavior may mask important qualitative changes. In light of these considerations, ongoing research may further explore the constructs that have long been of interest to parenting researchers by similarly delineating other parenting behaviors like responsiveness, sensitivity, or quality through analyses that examine qualitative differences in how these behaviors are expressed over time.

Additionally, advances in statistical techniques now allow a more complex understanding of dynamic change in human behavior, which can be modeled over long periods of time and take into consideration each individual's unique trajectory of behavior over time. In addition to methods that may allow us to understand what profiles of parental structuring behavior are the most helpful to young children as they develop, statistical growth modeling approaches that allow the comparison of the trajectories of two different constructs may help us further unpack how parenting changes alongside of child development.

Finally, though parents' adaptation over time to their children's emerging skills and abilities represents one important aspect of parenting as adaptation, successful parents likely

respond to a myriad of other factors that impact their parenting behavior. There is some evidence to suggest that parents parent differently to infants with differing temperamental styles (Sprunger, Boyce, & Gaines, 1985) and that one sibling's temperamental style moderates the relationship quality of a parent and his or her other child (Brody, Stoneman, & Gauger, 2008). These findings suggest that parents might also adapt to unique characteristics of their children and family dynamics. Moreover, parents likely also adapt to factors in their environment or related to their own characteristics (e.g., a parent coping with depression) with changes in the way they interact with their children over time. Unpacking these contributing factors to parental adaptation represents a potentially fruitful direction for future research.

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APPENDIX A: Tables

Table 1

Descriptive and Reliability Statistics for all Variables of Interest

	18 Months		24 Months		36 Months		K (PA)
	M (SD)	Range	M (SD)	Range	Mean (SD)	Range	
Structuring	18.85 (1.70)	11 - 20	19.18 (1.69)	12 - 20	19.06 (2.17)	4 - 20	0.80 (99.7)
<i>Child Skills</i>							
Attn. Focusing	14.86 (4.14)	3 - 20	16.54 (4.47)	3 - 20	16.80 (4.90)	1 - 20	0.70 (95.5)
Attn. Redirecting	6.57 (4.14)	0 - 17	2.74 (3.53)	0 - 14	1.41 (2.18)	0 - 10	0.70 (96.3)
Distracting	0.44 (1.01)	0 - 5	0.13 (0.54)	0 - 4	0.35 (1.54)	0 - 11	0.57 (99.2)
Planning	0.32 (0.84)	0 - 6	0.49 (1.00)	0 - 6	0.76 (1.39)	0 - 8	0.76 (97.6)
Child Language	10.89 (4.64)	0 - 19	10.34 (4.66)	1 - 19	12.17 (4.53)	2 - 20	0.91 (95.8)
Inhibiting	0.09 (0.38)	0 - 3	0.33 (0.76)	0 - 4	0.24 (0.76)	0 - 6	0.61 (98.7)
<i>Mother Strategies</i>							
Positive Emotion	19.49 (6.68)	1 - 35	22.46 (6.58)	3 - 36	22.41 (5.72)	1 - 38	ICC = 0.82
Negative Emotion	1.59 (2.01)	0 - 9	1.24 (2.10)	0 - 15	1.03 (1.63)	0 - 7	ICC = 0.82
Physical Movement	22.21 (5.95)	5 - 37	19.65 (5.43)	4 - 33	14.29 (5.25)	0 - 24	ICC = 0.82
Mother Language	18.41 (6.90)	2 - 35	18.08 (7.64)	2 - 35	21.38 (8.39)	3 - 40	ICC = 0.82

Table 3

Intercorrelations Among Mothers' Structuring Strategies Used

	Negative Emotion			Mother Language			Physical Movement		
	18m.	24m.	36m.	18m.	24m.	36m.	18m.	24m.	36m.
18m. Pos. Emotion	.08	-.00	.16	.40*	.05	.05	.19*	.12	.12
24m. Pos. Emotion	.04	-.02	-.01	.10	.20*	.07	.21*	.36*	.06
36m. Pos. Emotion	.02	-.00	.20*	.01	.09	.27*	.18	.30*	.58*
18m. Neg. Emotion	-	.26*	.16	-.03	-.11	.12	.09	.05	-.07
24m. Neg. Emotion	-	-	.07	-.10	-.09	.12	.09	.06	-.02
36m. Neg. Emotion	-	-	-	.06	-.02	.06*	.16	.02	.21*
18m. Mother Lang.	-	-	-	-	.39*	.29*	.35*	.06	.12
24m. Mother Lang.	-	-	-	-	-	.42*	.12	.11	.17
36m. Mother Lang.	-	-	-	-	-	-	.15	.25*	.35*
18m. Phys. Mov.	-	-	-	-	-	-	-	.26*	.24*
24m. Phys. Mov.	-	-	-	-	-	-	-	-	.30*
36m. Phys. Mov.	-	-	-	-	-	-	-	-	-

* $p < .05$

Table 4

Intercorrelations Between Child Skills Harnessed and Mothers' Structuring Strategies Used

	Positive Emotion			Negative Emotion			Mother Language			Physical Movement		
	18m.	24m.	36m.	18m.	24m.	36m.	18m.	24m.	36m.	18m.	24m.	36m.
18m. Attn. Focus	.38*	.10	.07	.24*	-.12	.18	.21*	.00	.08	.11	.10	.18
24m. Attn. Focus	.20*	.35*	.12	.08	-.17	-.01	.11	.01	-.07	.09	.20*	.14
36m. Attn Focus	.25*	.09	.65*	.11	.08	.06	.05	.05	.18	.21*	.07	.47*
18m. Attn. Redirect	-.09	-.05	-.03	-.16	.01	-.13	-.02	-.06	-.08	.18	.11	-.11
24m. Attn. Redirect	-.19*	-.28*	-.08	-.05	.23	-.04	-.15	-.05	.01	.03	-.05	-.02
36m. Attn. Redirect	-.16	-.05	-.23*	-.10	-.10	.01	.01	.13	.05	-.07	.04	-.19*
18m. Distracting	-.13	-.01	-.08	-.17	.01	-.01	-.04	.06	-.03	.14	.03	.03
24m. Distracting	.01	.07	.04	-.18	-.06	.10	.04	.09	.13	-.04	.18*	.01
36m. Distracting	-.23	.00	-.23*	-.16	-.03	-.06	-.07	-.14	-.01	-.24*	.07	-.13
18m. Planning	-.05	-.08	-.13	.08	.01	.08	.00	-.09	-.04	-.03	-.09	-.13
24m. Planning	.09	.09	.03	-.14	-.01	-.16	.14	.18*	-.01	.11	.06	.13
36m. Planning	-.01	-.15	-.17	-.06	-.05	.04	.10	-.08	.18	-.08	-.03	-.05
18m. Child Lang.	.48*	.05	.08	.00	-.08	.02	.79*	.31*	.23*	.32*	.03	.15
24m. Child Lang.	.08	.18	.06	-.03	-.19*	-.05	.43*	.86*	.31*	.05	.01	.06
36m. Child Lang.	.09	.02	.23*	.08	.09	.01	.30*	.43*	.90*	.15	.17	.33*
18m. Inhibiting	.03	.12	.06	-.04	-.08	.07	.03	-.02	-.08	.00	-.06	-.17
24m. Inhibiting	-.24*	-.30*	.05	-.17	.19*	-.10	-.18	.07	.18	.02	.00	.06
36m. Inhibiting	-.06	-.07	-.26	-.10	-.03	.17	.10	.09	-.09	-.07	-.18	-.32*

Table 5

Linear Growth Models Parameter Estimates, Standard Errors, and Fit Statistics

	Intercept Estimate (SE)	Slope Estimate (SE)	AIC	BIC	-2LL
Structuring	18.96** (0.15)	0.01 (0.01)	1430.5	1441.7	1422.5
<i>Child Skills</i>					
Attn. Focusing	15.28** (0.39)	0.10** (0.03)	2033.9	2045.0	2025.9
Attn. Redirecting	5.72** (0.37)	-0.27** (0.02)	1821.7	1830.0	1815.7
Distracting	0.33** (0.07)	-0.00 (0.01)	1030.3	1041.5	1022.3
Planning	0.33** (0.07)	0.02** (0.01)	1054.0	1062.4	1048.0
Child Language	10.47** (0.40)	0.08** (0.03)	2043.3	2054.4	2035.3
Inhibiting	0.17** (0.05)	0.01 (0.00)	719.4	727.7	713.4
<i>Mother Strategies</i>					
Positive Emotion	20.35** (0.56)	0.14** (0.04)	2283.9	2292.3	2277.9
Negative Emotion	1.52** (0.18)	-0.03* (0.01)	1452.7	1461.0	1446.7
Physical Movement	22.26** (0.48)	-0.44* (0.03)	2186.8	2198.0	2178.8
Mother Language	17.86** (0.60)	0.18** (0.05)	2391.3	2402.4	2383.3

* $p < .05$; ** $p < .01$

APPENDIX B: Figures

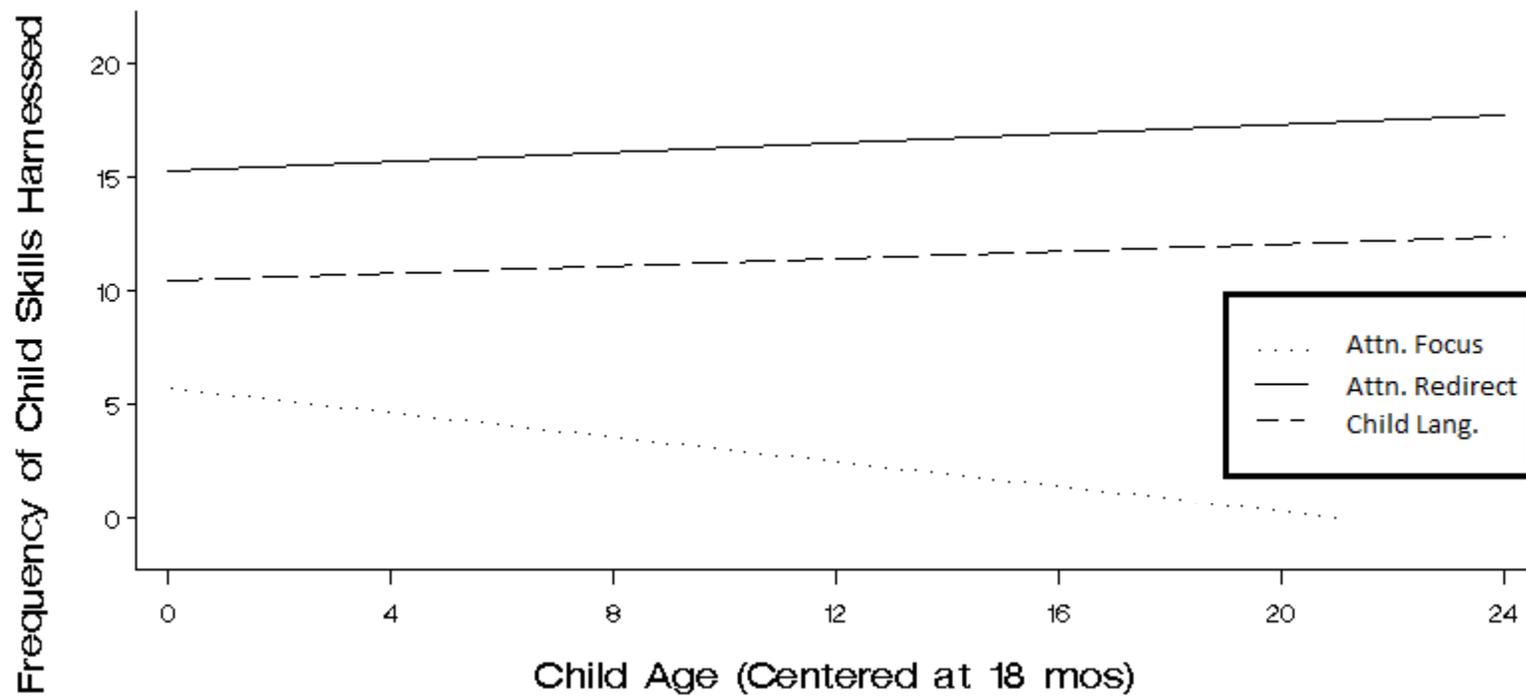


Figure 1. Growth Curves of Attention Focusing, Attention Redirection, and Child Language Skills Harnessed

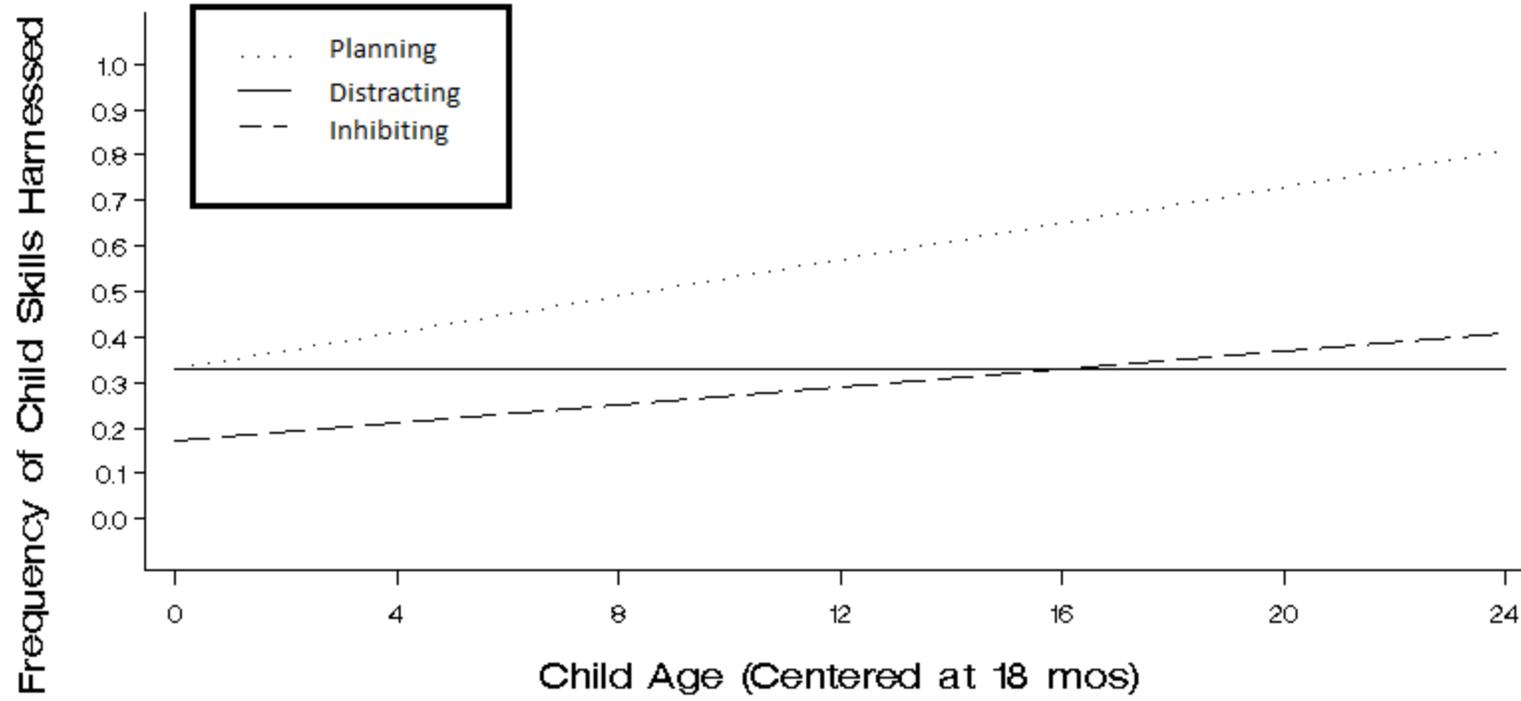


Figure 2. Growth Curves of Distracting, Planning, and Inhibition Skills Harnessed

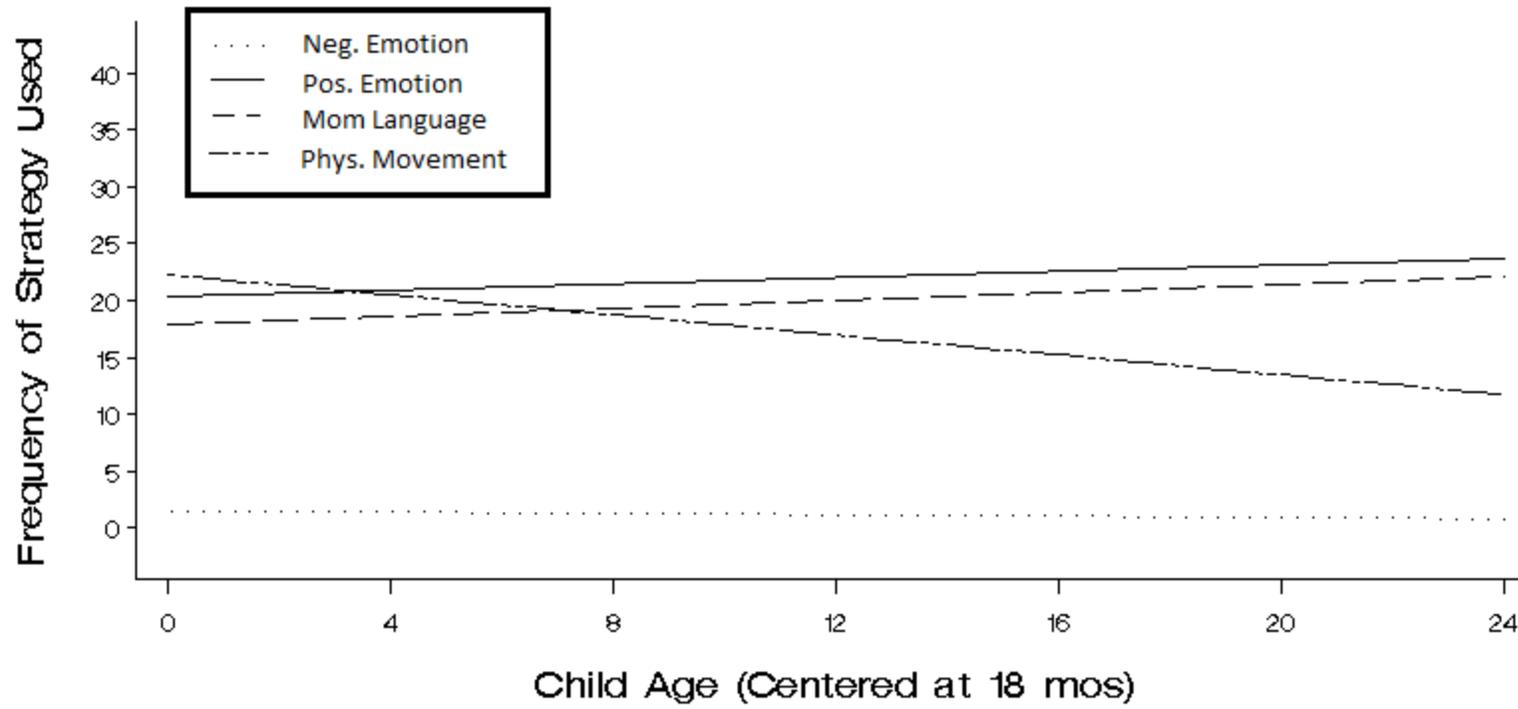


Figure 3. Growth Curves of Mothers' Structuring Strategies Used