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The Development of Behavioral and Emotional Self-Regulation During the Preschool Period.

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THE DEVELOPMENT OF BEHAVIORAL AND EMOTIONAL SELF-REGULATION DURING THE PRESCHOOL PERIOD

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of Psychology

by

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ABSTRACT

The study investigates age-related changes in behavioral and emotional self-regulation during the preschool period and the relationship between them. Behavioral self-regulation was measured by compliance without external monitors. Emotional self-regulation was measured by the expressed control of emotions and coping strategies.

Eighty eight preschoolers (45 5-year-olds; 43 3-year-olds) participated in a compliance-delay task. They were left alone for 10 min (self-regulated compliance) to sort cutlery in the presence of toys. The demand for emotional self-regulation was manipulated by hiding (low demand) or exposing (high demand) the toys. Children experienced both sessions. All procedures were video-taped. The expressed emotional comfort during the task was rated. Further, mothers and teachers completed ratings of children's compliance and coping strategies.

The predicted age-related increase in self-regulated compliance was found. The age-related increase in emotional comfort and posttask interviews supported the expected increase in emotional self-regulation. Mothers' and teachers' ratings indicated that preschool children gradually acquire more independent, problem-focused coping strategies. Boys are more likely to cope with frustration in an aggressive manner whereas girls are more likely to ask for emotional support and seek help.

This study is the first to provide evidence for the relationship between behavioral and emotional self-regulation during the preschool period. Self-regulated compliance is associated with independent, problem-focused coping strategies. Emotion-focused strategies, such as aggression and venting, are negatively correlated.

The finding that 5-year-olds worked less in the high demand condition than the low, whereas 3-year-olds did not, was interpreted as a reflection of differential ratio of child resources to task demands. The findings support the important contributions of emotional self-regulation to behavioral self-regulation. A new integrative model is proposed to explain the dynamics of the relationship between behavioral and emotional self-regulation. Specifically, the point is made that behavioral outcome depends on the resources available to the child and the demands for behavioral and emotional self-regulation of a particular situation.
CHAPTER 1: INTRODUCTION

An important issue for developmental psychologists is the study of the developmental course of self-regulation, particularly in the preschool period. Very young children tend to be impulsive and have difficulty resisting temptation. They have poor control over their emotions and experience frustration when they have to wait for exciting events (Kopp, 1982). As the awareness of the self increases and socialization efforts come into play, children gradually begin to self-regulate their behavior (behavioral self-regulation) and emotions (emotional self-regulation). However, if self-regulation continues to be poor, children may develop oppositional behavior, attention deficit, and conduct disorder (Cole, Zahn-Waxler, & Smith, 1994; Patterson, 1982). The patterns of self-regulation that develop during the transition period may become stable patterns that organize behavioral and emotional reactions to life events, later on. The preschool years are, therefore, an important period in the child’s transition from reliance on adults to reliance on the self for the regulation of behavior and emotions.

Researchers have focused on various aspects of behavioral and emotional self-regulation. Behavioral self-regulation is the ability to regulate behavior in an adaptive and flexible way. It is defined as the manifestation of many behaviors such as compliance, delay of gratification, ability to act in accordance with social norms in the absence of external monitors, and ability to quickly regulate behavior according to changing situations (Kopp, 1982).

Emotional self-regulation is defined as the ability to control the experience and the expression of emotions. Young children develop strategies to control
the experience of emotional arousal and learn display rules to control the expression of their emotions. Regulation may be directed toward either altering a bad mood or emotion, or may focus on the suppression or alteration of the behavioral expression of emotions (e.g., such as when children mask the expression of a negative response to an undesired gift by smiling). Emotional self-regulation is indicated by coping with frustrating events (Eisenberg, Fabes, Nyman, Bemzweig, & Pinuelas, 1994) and controlling facial expressions of emotions (Cole, 1986).

The present research aims to advance our knowledge about the developmental course of self-regulatory processes by examining age-related changes in behavioral and emotional self-regulation. It is based on Kopp’s (1982, 1987) developmental model of self-regulation. Taking an interactionist orientation, Kopp proposed that the development of behavioral self-regulation is a complex process linked both to caregiver’s transmission of standards of behavior and to young children’s developing cognitive abilities. Kopp also argued that there is a dramatic increase in the ability to self-regulate during the preschool years (ages: 3-5 years). Nevertheless, a review of relevant studies reveals a complicated pattern of evidence that does not clearly support Kopp’s speculation of an increase in regulatory ability during the preschool period. Therefore, it is important to provide additional evidence to clarify this issue.

Regarding emotional self-regulation, there are only a few studies to inform us about the development of coping skills in the preschool period, although there are numerous studies that have focused on toddlerhood (e.g., Gianino & Tronick, 1988;
In addition, there has been very little empirical research to examine the relationship between behavioral and emotional self-regulation, although there has been some theoretical speculation. Kopp (1989) proposed that emotional self-regulation significantly contributes to the process of developing behavioral self-regulation, especially after the age of 3. At that age, children begin to accept and internalize standards of behavior with agreeable affect. However, there is no empirical evidence to date bearing on this hypothesis. The proposed research attempts to support this assumption by investigating associations between variables of behavioral (compliance, delay) and emotional (coping skills, expressive control of emotions) self-regulation.

To summarize, this research aims to advance our understanding of self-regulatory processes in young children by investigating the development of behavioral and emotional self-regulation in preschool children (3 and 5 year olds) as well as the association between behavioral and emotional self-regulation. This is particularly important because Kopp's (1989) theory predicts large age-related changes in emotional self-regulation after the age of 3 years. The study is organized in chapters as follows. Chapter 2 presents the theoretical background of behavioral self-regulation. Theoretical explanations are discussed and possible precursors of behavioral self-regulation are identified. A review of developmental studies on compliance and ability to delay is critically presented. The chapter ends with a summary of the main points, including how the proposed study is related to the existing literature.
Chapter 3 focuses on emotional self-regulation. It presents the historical and contemporary theoretical background as well as an extensive discussion of the precursors of emotional self-regulation. The relationship between coping skills and emotional self-regulation is discussed next. Developmental studies on coping skills and expressive control of emotions are presented. Finally, a summary of the chapter contains the main points.

Chapter 4 integrates chapters 2 and 3 and presents the specific aims and hypotheses of this research. Chapter 5 presents the methodology of the study. The preliminary and final analyses are included in chapter 6. Finally, chapter 7 discusses the findings of the study, the main contributions of this research, and directions for future research and theory development.
CHAPTER 2: THEORETICAL BACKGROUND OF BEHAVIORAL SELF-REGULATION

A description of early and contemporary approaches in the study of behavioral self-regulation is provided in the next two sections. The review of these theories reveals a gradual refinement of the concept of self-regulation, a progressive emphasis on the cognitive precursors of behavioral self-regulation and a greater interest in developmental changes.

HISTORICAL AND THEORETICAL BACKGROUND IN THE STUDY OF BEHAVIORAL SELF-REGULATION

The question of behavioral self-regulation was addressed in Freud's personality theory. According to Freud (1959), infants' personality is impulsive because it is governed by the pleasure-seeking structure of the id. The thinking processes of infants are primary, irrational, and unable to control the functions of the id because they are regulated by the pleasure principle; the pressure to limitless repetition of pleasurable experiences. It is often the case, that the needs of infants are not always satisfied and feelings of frustration are experienced. In order to cope with such feelings, Freud proposed that infants are engaged in ideation of the desired object or situation. For example, infants desiring an unreachable toy may comfort themselves by the hallucination of the toy.

As infants mature, another structure of personality, the ego, develops. The ego is guided by the reality principle (i.e., ability to distinguish reality from mental ideas) and secondary thinking processes which are rational. As a result, infants can now inhibit and control their drives. Moreover, the ego develops defense mechanisms to control behavior, often without the conscious awareness of the child. Finally, when the third
structure of personality, the superego, develops, children incorporate societal rules in guiding their behavior. A key process underlying the development of superego is identification with the parent. Children come to “internalize” their parents and “introject” their values (Maccoby, 1992).

In sum, for Freud, children fully master self-regulation with the emergence of the superego (i.e., conscience). The underlying process of this development is identification with parents. The concepts of conscience and identification are widely accepted by psychologists (Maccoby, 1992), although there has been some debate concerning the three structures of personality. Moreover, studies have demonstrated that Freud was inaccurate in predicting ideation of desired objects as a means to regulate behavior (Mischel, 1983; Reitman 1987).

Along the lines of the ego structure, Block and Block (1980) suggested two personality dimensions that are implicated in the regulation and organization of behavior; ego-control and ego-resiliency. Ego-control is defined as the threshold or boundary of the containment of feelings and impulses. At one extreme, there is overcontrol, defined as the impermeable boundary that results in the “excessive containment of impulse, delay of gratification, inhibition of action and affect, and insulation from environmental distractors” (p. 43). At the other extreme, there is undercontrol, defined as the excessively permeable boundary that results in “insufficient modulation of impulses, the inability to delay gratification, immediate and direct expression of motivations and affects, and vulnerability to environmental distractors” (p. 43).
Ego-resiliency, on the other hand, refers to the capacity of a boundary to change its characteristic level of permeability. In other words, ego-resiliency is the capacity to modify the levels of ego-control. At one extreme, ego-resiliency is defined by Block and Block (1980) as the “resourceful adaptation to changing circumstances and environmental contingencies, an analysis of the balance between situational demands and behavioral possibility, and a flexible invocation of the available repertoire of problem-solving strategies” (p. 48). The other extreme end of ego-resiliency is often called ego-brittleness; and, is defined as the inability to respond to the dynamic requirements of the situations, a tendency to become disorganized when encountering changed circumstances or when under stress, a tendency to respond stereotypically to new situations and a difficulty in recovering after traumatic experiences. Block and Block assume that the antecedents of ego-control and ego-resiliency include both genetic factors and socialization practices. In particular, ego-resiliency may be observed very early in life in the extent to which infants respond to environmental changes, can be comforted, and modify sleep-wake states. Block and Block (1980) found that characteristics of the parents such as loving and competent, as well as socialization practices are related with ego-resiliency and ego-control in their children. Although, nowadays, the concepts of ego-control and ego-resiliency are less popular, Block and Block (1980) significantly contributed to our understanding of self-regulation by providing a well-articulated theoretical model and by developing a battery of tests for regulatory behaviors, which are still in use (e.g., Cournoyer & Trudel, 1991).

A rather different approach for explaining self-regulation is taken by learning theorists who claim that control of behavior is dependent on the nature of its
consequences. Behaviors resulting in reinforcing outcomes tend to be repeated, whereas behaviors with punishing consequences tend to wane (Miller, 1983).

In a fictional account entitled Walden Two, Skinner (1976) described several ways in which the children of Walden Two were taught to control their impulsive behavior. For example, in order to teach children to patiently wait for their meal, after they arrived home tired and hungry, they were made to stand for 5 minutes in front of steaming bowls of soup. In this way, children also learned to develop means to control their impulse by diverting their attention from food, joking, and singing, rather than complaining.

Taking a social-learning approach, Bandura, also emphasized the external control of behavior (Grusec & Goodnow, 1994). Bandura (1962) claimed that the source of self-regulative processes lies in modeling and in direct tuition. Adults respond differently to children’s behaviors and this discriminating responsivity informs children about what are the standards of behavior. Children also observe adults prescribing standards for themselves and engage in self-evaluative behaviors (e.g., I shouldn’t have done this). Finally, children are reinforced by parents for their attempts to self-regulate their behavior.

Bandura, went one step further to propose a shift from external sources of control to the individual. He speculated that children internalize standards of behavior and they use them to judge their own reactions. Therefore, children do not change their behavior constantly in accordance to momentary influences but they rather form “ideological positions in spite changing situations” (1962).
The theories described above vary to the degree of importance they ascribe to environment and socialization practices. Block and Block (1980) as well as Freud (1959) allow room for biological influences in the development of self-regulation. Bandura (1962) emphasized the transition from other- to self-regulation through the process of internalization of standards of behavior. Contemporary theories are concerned with all these issues. In addition, they emphasize cognitive processes underlying regulatory abilities as well as the age-related changes in them. One such theory is Kopp's developmental model of behavioral self-regulation that is presented next.

**CONTEMPORARY APPROACHES IN THE STUDY OF BEHAVIORAL SELF-REGULATION**

Kopp (1982, 1987) proposed a developmental model of self-regulation, according to which, children do not attain high levels of maturity in self-regulation all at once but go through successive phases. Each phase signifies a qualitative change that indicates higher levels of behavior. The phases include: neurophysiological modulation, sensorimotor modulation, control, self-control, and self-regulation, as discussed below.

The first phase (birth to 2-3 months) signifies neurophysiological and reflexive adaptations to the environment such as the capacity to soothe one's self (e.g., thumb-finger sucking is used to modulate arousal state). During this phase, Kopp speculates a notable variability among children, with some children having low thresholds, thereby, becoming easily aroused and difficult to calm. It is noted, however, that the long-term implications of such individual differences are not yet known.
The second phase (3 to 9-12 months) denotes the sensorimotor adaptations made to perceptual and motivational stimuli. Children become able to control movement voluntarily and not reflexively (e.g., ability to reach and grasp). At this phase, children's actions are also motivated by external factors, such as parent's attempts to draw children's attention to an object. Children become capable of differentiating between actions of their own and actions of others. Individual differences during the third phase are contributed to biological dispositions (temperament) and environmental conditions such as maternal sensitivity (discussed later in detail) and adequate stimulation by objects.

The control phase (9-12 to 18+ months) is characterized by an increasing awareness of social demands set by caregivers. Children become able to initiate, modulate or cease communicative actions with other interactional partners. During this period, compliant behavior which is the hallmark of socialization, begins to appear. Kopp views children's monitoring of behavior as a result of quantitative and qualitative changes occurring in cognition during this period; children begin to recognize invariant forms of objects, become aware of familiar and unfamiliar people, and demonstrate early forms of categorization and object permanence (Flavell, 1988).

Moreover, physical advances, such as standing and walking, enable children to differentiate themselves from objects, thereby, giving them a sense of identity. However, children do not yet have the sense of continuing identity, because they lack representational thinking. According to Kopp, compliance and self-inhibition are dependent upon external signals, because the ability to recall and reflect is still poor.
Therefore, children have little understanding of the reasons that make some behaviors appropriate and others inappropriate.

In the next postulated phase, self-control (24+ months), it is suggested that children can now go along with caregiver expectations in the absence of any external monitors. Kopp linked this phenomenon to the growth of representational thought and memory ability. These cognitive advances allow children to recognize and remember rules regarding daily activities. The ability to recall means that the child needs fewer external reminders for self-monitoring behaviors. Therefore, the child begins to internalize standards of behavior.

Kopp’s final phase, labeled self-regulation (no time is specified but it progresses from self-control), involves flexible and adaptive control processes that can meet quickly changing situational demands. Self-regulation is defined as the manifestation of many behaviors such as compliance, delay of gratification, ability to act in accordance with social norms in the absence of external monitors, and ability to quickly regulate behavior according to changing situations (Kopp, 1982). According to Kopp, the shift from self-control to self-regulation, albeit quite subtle and gradual, parallels the growth of cognitive skills that is also gradual in the early preschool period. Even though self-regulation is presumed to emerge during preschool years, Kopp suggested that its consolidation and refinement continues for many years thereafter.

Kopp’s model emphasizes the interplay between caregivers and young children and stresses the relation between the emergence of self-regulatory skills and young children’s biological dispositions (e.g., activity level, level of threshold) and developing
cognitive abilities. Kopp’s model also emphasizes two normative developmental trends. First, there is a progression from external to internal factors that govern self-regulation (Kopp, 1995). That is, early forms of self-regulation are viewed as being imposed by others than being self-generated. The second normative trend is that there is an age-related increase in the capacity to self-regulate (i.e., the ability to comply and delay gratification which both are expected to increase with age) (Kopp, 1982).

The role of the caregiver seems multifaceted and includes decisions about specific standards of behavior that need to be communicated to young children, when they should be communicated, and in general, how to move young children toward compliance and internalized acceptance of standards (Kuczynski, 1984; Kuczynski, Kochanska, Radke-Yarrow, & Girmius-Brown, 1987; Power & Chapieski, 1986). The role of young children, in turn, is to understand, acknowledge, and accommodate to caregiver’s socialization pressures. At the same time, children also exert some influence on caregivers and ultimately, balance the caregiver’s demands with their own personal objectives (Bell & Chapman, 1986; Crockenberg & Litman, 1990).

Consistent with this conceptualization, a dominant empirical theme is focused on caregiver behavior and activities that facilitate behavioral self-regulation, or mediate the transmission of standards from the caregiver to the child (Ainsworth, Blehar, Waters, & Wall, 1978; Kuczynski, 1984; Parpal and Maccoby, 1989). In another vein, children’s own developing abilities, such as comprehension of caregiver’s prohibitions and requests have been studied as prerequisites to behavioral self-regulation (Kaler & Kopp, 1990).
In the following sections, studies demonstrating possible connections between the caregiver, cognition, and the development of behavioral self-regulation are discussed. In addition, data regarding the developmental course of behavioral self-regulation are presented.

**Precursors of Behavioral Self-Regulation**

The precursors of behavioral self-regulation can be either external support systems such as socialization agents, particularly the caregiver, or internal support systems that involve processes within the child, such as the development of attention and language comprehension.

**External support: socialization agents**

**Caregiver**

One can identify three perspectives in the literature regarding the role of the caregiver in the development of behavioral self-regulation of preschool children. These perspectives focus on different aspects of the caregiver including behavior, discipline techniques, and interactive style with the child, as discussed next.

**Caregiver’s characteristics**

First, there are studies that examine the type of the caregiver’s behavior that facilitates child’s compliance. For example, attachment theorists, suggest that compliance is the outgrowth of a secure attachment which is highly dependent upon the caregiver’s sensitivity and responsiveness (Ainsworth et al., 1978).

Early studies have reported a positive relationship between compliance with the mother and security of attachment in the first year. During this period, compliance is considered a function of security and not of maternal discipline techniques (Slayton,
Hogan, & Ainsworth, 1971). This development increases the likelihood that the child will be also compliant in the second year (Matas, Arend, & Sroufe, 1979). It also appears that securely attached children are more cooperative than are insecure children in interactions with other than the caregiver (Londerville & Main, 1981). Londerville and Main (1981) suggested that what mediates between compliance and security of attachment is the caregiver’s warmth of voice in giving commands, and gentleness in physical intervention. These two behaviors were related to both compliance and security. This is not to suggest that children are at the immediate control of the way commands and prohibitions are issued. As discussed below, children do influence parental behavior in their interaction with their parents.

**Discipline techniques**

Second, there are researchers who suggest that children’s self-regulatory abilities grow out of specific types of discipline techniques used by the caregiver. Ainsworth et al. (1978) asserted that the main factor underlying the assimilation of social norms by children is the interpersonal warmth between children and parents which also includes the use of reasoning and acceptance of the child. In examining mother’s strategies to elicit long-term compliance, Kuczynski (1984) reported reasoning as the best predictor relative to power assertion, character attributions, and nurturance.

Children are also more compliant when attention interventions (attempts to modify perceptual activity of the child) are used versus action interventions (attempts that intend to influence the child’s immediate motor behavior) (McLaughlin, 1983; Schaffer & Crook, 1980). Direct imperative control behavior of the parent seemed to be
more effective with 1.5 year olds than were suggestions and questions, whereas the reverse was true of 3.5 year olds (McLaughlin, 1983).

Another study reported that lack of self-regulatory behavior (e.g., defiance) in 2-year old children was associated with power-assertive techniques by the mother. These methods were intrusive in nature and conveyed negative feelings towards the child (e.g., threat). However, compliance with the mother was more associated with mother’s use of less powerful methods of control. When mothers combined guidance with control they elicited more compliance (Crockenberg & Litman, 1990). Parents who relied primarily on external rewards and punishments to achieve child’s compliance have children who show the lowest levels of internalization (Power & Chapieski, 1986).

Consistency and age appropriateness in parental demands as well as reinforcement of child’s compliance were also significant predictors of child’s behavioral self-regulation (Maccoby & Martin, 1983). In addition, it was found that parental warmth bind the children to their parents in a positive way, that is, it made the children more responsive and willing to accept guidance. Thus, children were more likely to comply. Moreover, Parpal and Maccoby (1989) found that a child’s willingness to comply is enhanced by parents having previously demonstrated a willingness to comply with the child, a process called reciprocity. Finally, socialization practices that foster empathetic reactions to children may be especially important in encouraging the development of behavioral self-regulation (Hoffman, 1988).

Data from an observational/interview study of 5- to 6-year-olds conducted by Manire and Power (1983; cited in Power & Manire, 1992) showed that parents who
applied direct-external discipline practices (e.g., force compliance) at home had children who did not behave at school. Similar results were obtained by Kobayashi-Winata and Power (1989) in a study of Japanese and American families, thus, rendering cross-cultural validity to the findings. Therefore, it appears that direct structure and guidance may interfere with the development of self-regulation. What seems to foster self-regulation are techniques that are powerful enough to produce compliance and subtle enough to convey to children the message that their behavior is not attributed to external sources (e.g., reward, punishment; Lepper. 1983).

**Caregiver/child interaction**

Finally, there exists a trend in the literature, according which, the development of behavioral self-regulation is an outcome of a team work between the caregiver and the child (Kopp, 1995). From this perspective, both partners change as the child masters self-regulation. The challenge for the caregiver is to move the child from infancy to toddlerhood and help the child understand the need to be responsive and responsible to others. The challenge for the child in to learn and accept social rules and constraints. However, the caregiver is mostly challenged because the child, as a developing organism, keeps changing. Therefore, each age-period places different demands on the caregiver who not only has to adjust but also to find the resources needed to support the child.

To date, there are few studies that show caregiver's adaptations to developmental changes in the child. Kuczynski et al. (1987), for example, found that mothers modified their strategies to elicit compliance according to the child's age. In this study, maternal control strategies shifted from the physical to the verbal modality as
the age of the child increased from 15 to 44 months. Moreover, efforts to explain, bargain, and reprimand increased with age while efforts to distract the child decreased.

In another study, mothers were asked to report the kind of rules they pose on their children (aged 13.5 and 30 months old) as well as to rate their children's compliance. The results showed age-related increases in the number and kind or rules. Mothers of younger children emphasized more safety rules, whereas mothers of older children stressed rules that enabled children to be more independent and integrated into the family (Gralinski & Kopp, 1993).

Power and his colleagues (e.g., Power & Chapieski, 1986; Power, McGrath, Hughes, & Manire, 1994) observed parent-child interactions and reported that parents of 2-year-olds tend to force compliance significantly more often than do parents of 4- and 6-year olds. Moreover, with increasing age, parents allowed children more opportunity for self-regulation, while there was a shift from direct, external (e.g., force compliance, demonstrate/assistance) to indirect, external (e.g., reasoning and persuasion) parental compliance strategies. In addition, parents of the 2-year-olds appealed to the consequences of the child’s actions in the past whereas parents of 4- and 6-year-olds were more likely to make references to parental authority and to child feelings.

Finally, Vygotsky (1978) has provided the concept of the zone of proximal development to describe the interactional context in which the socializing agent organizes activities for the child by taking into account the developmental level of the child. The zone of proximal development describes the performance of children on a difficult for their level task with the guidance of the caregiver. Such observations
indicate that the caregivers adjust their speech and actions to the child's abilities and needs (Wertsch, 1979). Caregivers take into account the child's self-monitoring behavior and age in constructing an agenda with activities for the child (Rogoff, Malign, & Gilbride, 1984). Kopp (1992) also provided evidence that mothers tend to organize tasks to facilitate self-regulation in preschoolers. In particular, mothers' intervention tended to shift from physical to verbal as children grew older.

**Internal support: cognitive mechanisms**

Although caregivers provide the basis for standards of behavior, they cannot make the child adopt them. Children must have some understanding of the caregivers' expectations and the motivation to follow them. What are the cognitive mechanisms that guide children's understanding? Specific cognitive mechanisms implicated in the development of self-regulation include: language, representational thinking, attention, and comprehension and internalization of standards, as discussed next.

**Language**

The regulatory role of language was mainly emphasized by Soviet theorists (Luria, 1961; Vygotsky, 1978) who speculated a progressive use of language in self-regulation. Initially, the behavior of young children who cannot yet speak is regulated by the speech of other people. Eventually the other's speech is transformed into external self-speech (private) which is defined as overt language directed to the self for the purpose of guiding cognitive performance and regulating social behavior. Private speech in turn transforms into inner speech (thought) at around the age of 4-6 years (Zivin, 1979).

According to Vygotsky (1962), private speech represents the children's attempts to use language as an instrument of thought, that is, as a tool to plan, guide, and monitor
activity. Private speech is emitted as an after thought, following the action. With increasing age, however, the timing changes and private speech first accompanies and later precedes children's actions. By preceding children's actions, private speech gradually develops into the ability to orient, plan, and guide functions, characteristics of human verbal thought. Vygotsky viewed private speech as the transition point between the vocal and inner language, the moment where language and thought unite to constitute verbal thinking. He proposed that private speech diminishes and disappears with age because it goes underground, to constitute inner speech or verbal thought.

Luria (1961) has shown that after the age of 3, children can use self-directed speech to control their own motor behavior. The ability to voluntarily inhibit action may be considered especially relevant to self-regulation, because without it, young children may not be able to resist temptation. Luria gave to 1½ - 5 year olds a bulb-squeezing task in which each child was requested to say "press" and squeeze a rubber bulb, following which the child was told to say "don't press" and release the bulb. This type of task is a motor inhibition problem that requires children to stop a behavior that is already in progress. Children below the age of 3 responded to their own verbal instructions to initiate behavior, but they could not use the verbal command to inhibit the ongoing action. Upon giving the directive "don't press" they actually squeezed the bulb even harder!

Based on this finding, Luria concluded that before the age of 3, children cannot use speech to regulate their own behavior. Two-year olds simply react to the energizing, motor quality of the speech, rather than to its meaningful content (Tinsley & Salatas,
Therefore, regardless of whether they tell themselves to press or not to press the bulb, they continue to engage in bulb-squeezing behavior.

Vygotsky (1978) emphasized the importance of private speech during problem-solving because it allows children to see a wider range of possible solutions. Through words, Vygotsky claimed, the child creates specific plans of action and can act in less impulsive ways. Therefore, language during problem-solving activity helps and facilitates the achievement of a correct solution.

The claim that private speech has regulatory functions has been supported mostly by two facts: (a) children talk to themselves about the tasks or the activities they are engaged in (Furrow, 1988), and (b) private speech increases during meaningful times of the task such as moments of failure or special difficulty (see Frauenglass & Diaz, 1985, for review).

Nevertheless, the role ascribed to private speech in self-regulation is not fully supported by empirical findings. In a major review, Fuson (1979) found that spontaneous use of self-regulatory speech is not characteristic of all children. Moreover, certain variables such as age, task difficulty, communication level, IQ, impulsiveness, and possibly, gender influence its use. Fuson’s conclusions are not surprising in view of recent research showing that young children limited in productive language have some self-regulatory capabilities (Mischel, 1983). Thus, processes either in addition to, or other than language drive early forms of regulation.

Moreover, even advanced verbal development does not affect the early operation of behavioral self-regulation. Kopp (1987) reported that two-year old children who had
language production skills consonant with those of 3-year-olds showed self-regulation abilities and limitations more similar to their chronological age peers than to older children.

Finally, evidence against the regulatory function of speech is that (a) there are studies that do not reveal a positive effect of children’s spontaneous private speech on task performance, and (b) the frequency of private speech utterances produced by children is typically so low that it is difficult to ascertain their relevance to a child’s cognitive development (Frauenglass & Diaz, 1985). However, Frauenglass and Diaz (1985) argue that it might be the nature of task and instructions responsible for the scarcity of private speech.

Spoken language may have a regulatory role in terms of testing and reinforcing one’s own knowledge of standards. For example, a 2-year old toddler may use speech to reinforce self-inhibition around touching prohibitions (e.g., repeating “No!”) (Kopp, 1991). Gelman (1988) suggested that language provides a means to restructure and revise one’s ideas. Bruner and Lucariello (1989) indicated a corrective action of speech that occurs at about 2 years of age, suggesting that the child appreciates “speech standards” established by others.

Representational thinking and execution of verbal rules

Kopp (1982, 1987) has suggested that the development of representational thinking, ability to think in symbols (Piaget, 1952), is essential to behavioral self-regulation because it allows children to think about the self in relation to others, about

Representational thinking, however, may not be enough, for children to apply societal rules in guiding their behavior. Children must be able to form a plan of action and have the intention to execute it; in other words, children must translate the plan of execution to behavior. As discussed above, Luria (1959) demonstrated that children by the age of 2.5 can understand and repeat instructions but cannot execute them until sometime after the third year. Other research supports and extends Luria's findings. Zelazo and Reznick (1991) found a rapid increase at the end of the third year in the systematic use of explicit, but arbitrary rules to guide motor behavior in a sorting task. The 2.5-year-olds who participated in this study, although they were aware of the rules, they were not able to use their knowledge to execute their plan of action. The age-related increase in the executive function of rules seems to be due to an increasing ability to inhibit incorrect responses (Zelazo, Reznick, & Pinon, 1995).

Attention

The role of attention in self-regulation has been discussed in two ways. First, drawing attention away from objects to postpone gratification is seen as an important strategy used by preschool children. Mischel (1983), for example, found that it is the most effective way to delay and generate distraction. Vaughn, Kopp, Krakow, Johnson, and Schwartz (1986) have extended these findings to children as young as 2 years of age. Second, attention to an object or an individual (social cues) was seen as a way of obtaining information about standards of behavior. In particular, selective attention to verbal and
visual responses of the caregiver appears to be involved in self-regulation (Kopp, 1987). Why, however, children prefer to attend to these messages rather than other competing cues from the environment? Kopp suggested that children have a social motive to attend to the caregiver’s cues. This motive originates from an understanding at the end of the first year that a shared meaning system exists between the caregiver and the child. Such understanding is evident when children use objects to initiate communication and when children refer to their caregiver as a source of information in ambiguous situations (social-referencing; Campos, Campos, & Barrett, 1989). Kopp concluded that behaviors like these demonstrate that children appreciate the caregivers for what they can do.

In addition to selective attention, sustained attention is also important in self-regulation. The child needs to sustain attention in order to understand and encode the message from the caregiver. This ability probably increases with age as children’s actions become more intentional. Finally, Kopp (1987) speculated that sustaining attention is probably a function of individual differences in factors such as activity level.

**Comprehension and internalization of standards**

Another cognitive mediator of behavioral regulation is comprehension of rules and standards of behavior. If children lack understanding, then self-regulatory behaviors such as compliance, are more likely to be accidental than intended (Kopp, 1987). Children acquire social understanding by attending to information delivered through direct tuition or observation of others’ interactions. Children also learn rules by observing others enacting social rules or being subjected to the consequences of rule violations (Power &
Manire, 1992). It is expected, that comprehension undergoes a growth spurt toward the end of the first year and into the second (Bates, Bretherton, & Snyder, 1988).

Recently, Kaler and Kopp (1990) focused on the analysis of child comprehension, child compliance, and the match between child comprehension and compliance/noncompliance to adult requests. In this study, three age groups of children (12-13, 14-16, and 17-18 months) and their mothers were observed in a laboratory situation, while mothers issued requests providing minimal visual cues. The findings showed that the younger age group comprehended about 20 words as opposed to 50 that previous studies reported. The results also indicated a significant increase in instances of compliance to requests that were comprehended and a trend toward a decrease of compliance to requests that were not comprehended. However, the percentage of comprehended requests that were complied with did not change over time. Overall, the data from this study suggest that children comply when they understand and, conversely, do not comply when they do not understand. The point has been made that increasing comprehension is linked to children’s ability to comply with the caregiver’s requests. However, this does not imply that children will invariably show compliance, because the growth of autonomy (Wenar, 1982) probably precludes such consistency.

Finally, young children’s knowledge of standards for behavior seems to play an important role in the development of self-regulation. Kopp (1991) asked children to think of a particular situation, such as not running in the house. Then, children were asked whether they were allowed to run in grandma’s house, in a playground, and in a store. The results showed that 4-year-olds’ responses were appropriate and generalized
across situations. Therefore, children did not have to think through each new situation relative to standards of behavior. Once children understand the similarities across situations and generalize the rule, compliance is more likely to occur.

For some socialization theorists, internalization has almost a tautological relationship with self-regulation (Hoffman, 1988; Lepper, 1983; Power & Manire, 1992). Internalization evidences itself when children are internally motivated to comply with social rules. That is, the child does not need either external monitors, such as parental control, nor external motivation, such as rewards and punishment to regulate behavior (comply).

**Summary of precursors**

In sum, it has been suggested that the caregiver and certain cognitive processes are implicated as children begin to make the transition from other regulation to self-regulation. It is apparent that the caregiver, in most cases the mother, holds a special place in the development of self-regulation. The caregiver’s role in fostering self-regulation is to offer the child assistance and guidance during the early years, but to gradually decrease this support as the child grows older. Thus, the child receives more and more responsibility for behavior with increasing age, and that fosters behavioral self-regulation (Power & Manire, 1992).

In addition, processes of internalization of standards are of particular importance for the ultimate attainment of behavioral self-regulation. These speculations, however, require further empirical validation. In addition, although the cognitive underpinnings of
self-regulatory activities are crucial, motivational and self needs may also play an important role (Master & Santrock, 1976).

**Developmental Course of Behavioral Self-Regulation During Preschool Years**

The following section reviews studies that provide developmental data on the course of behavioral self-regulation during the preschool period. In specific, these studies have examined age-related changes in compliance and delay of gratification. Compliance is usually defined as the child's ability and willingness to modulate behavior in accordance with the caregiver's expectations and demands. Compliance is measured by the number of times the child complies with parental requests. Ability to delay gratification is measured by the time latency to play with an attractive toy, eat a favor food, or unwrap a gift.

**Compliance**

Schneider-Rosen and Wenz-Gross (1990) investigated children's compliance to both parents at the age of 18 (n = 31), 24 (n = 31), and 30 (n = 36) months, in a variety of laboratory situations, including delay of gratification, clean-up, uninvolved play, reading a story, and problem solving. Contrary to expectation, there was no significant increase in compliance across all situations. The 18- and 30-month groups did not differ from each other and were significantly more compliant in the reading and delay task than the 24-month group. In problem solving, the 18- and 30-month groups were less compliant than the 24-month group. Only in uninvolved play were the 18- and 24-month groups significantly lower in compliance than the 30-month group. This pattern of results suggested a quadratic rather than the expected linear relationship between compliance and age.
In contrast, Holden and West (1984) reported that 42-month-old children (n = 12) were more compliant to their mother than the 29-month-old children (n = 12), in a laboratory situation.

Longitudinal data from natural observations at home reported no significant change in compliance to maternal requests during the age span between 1.5-3.5 and 5 years. Moreover, compliance showed significant stability over time (Kuczynski & Kochanska, 1990).

More recently, Power et al., (1994) investigated parent-child interactions in their homes and reported a significant increase in compliance to both mother and father from the age of 2 to 4, but no significant changes from 4 to 6 years of age.

Gralinski and Kopp (1993) asked mothers to rate their children’s compliance to house rules. They also examined the transition from lower to higher levels of compliance as follows: the mothers were asked to rate the children’s responses to prohibitions and requests by choosing one of the following four choices: 1 = never conforms; 2 = conforms only with maternal intervention; 3 = conforms sometimes without maternal intervention; 4 = conforms without maternal intervention. High compliance scores reflect higher level of self-regulation (it is internally driven), whereas low compliance scores reflect low levels of self-regulation (requires external control).

For the young groups of the study (13-, 18-, 24-, and 30- month age groups) a linear increase was found in four rule-categories: safety, protection of property, respect for others, and mealtime routines. Post hoc analyses revealed significantly higher ratings of compliance to safety and personal property standards at 24 months as compared to 13...
months. Reported compliance to mealtime standards, on the other hand, was significantly higher at 30 months compared to 13 months. Contrasts of ratings related to respect to others failed to reach significance. In contrast, no significant changes were reported across age groups for the older group (30-48 months). Interestingly, these children needed external sources of control (e.g., maternal reminders) to postpone gratification and participate in family routines, whereas they were less reliant on maternal intervention in complying with other categories, particularly safety and property rules.

**Compliance and delay**

In a cross-sectional study (Howes & Olenick, 1986), compliance to parents' requests to clean-up and complete a boring task as well as ability to delay gratification, both in the presence and absence of the parent were tested in 18-, 24-, 30-, and 36-month old children. These behaviors increased with age in the laboratory. However, when the children were observed at home and at the day-care, no significant increase in compliance to parent and teacher was found. Children in low-quality day-care centers and children at home, but not children in high-quality day-care centers increased their ability to delay.

In another study, 18-, 24-, and 30-month-old children participated in one clean-up and three delay tasks (Vaughn, Kopp, & Krakow, 1984). In the telephone task, the child was asked by the experimenter to delay playing with an unusual toy-telephone. After the request the experimenter left the child and the mother alone in the room while the mother was instructed not to interact with the child. In the food task, the child was asked by the experimenter to delay looking for raisins under several cups while only the
experimenter was present in the room. Finally, in the gift task, the child was asked by
the experimenter to delay opening a gift and then was left alone in the room. Overall,
the results revealed an increase in compliance to the mother and ability to delay for all
groups.

Post hoc tests showed that each group of children was significantly different
from the other two on the telephone and gift delivery tasks. On the food reward task,
only the 18-month-olds were significantly different (lower scores on both measures)
from the other groups. Post hoc tests on the compliance data showed that only the two
extreme groups (18 and 30 months) were significantly different from each other.

Delay

By putting together evidence from other studies with older children, some on a
single age group, one may conclude that performance on waiting tasks increases
monotonically with age from 2 years through the early elementary years (Golden,
Montare, & Bridger, 1977; Mischel, 1974; Mischel & Metzner, 1962; Toner, Holstein,
Hetherington, 1977; Toner, Moore, & Emmons, 1980; Schwarz, Schrager, & Lyons,
1983). Moreover, from 4 through 8 years of age, children increasingly prefer cognitive
strategies that have been shown to facilitate waiting (e.g., avoiding consummatory or “hot”
ideation; Yates & Mischel, 1979; Mischel & Mischel, 1983).

Delay performance seems to be greatly influenced by knowledge about and
preference for delay strategies. Mischel and Mischel (1983) asked kindergartners, 3rd-,
and 6th-graders to think about self-statements which might help them to delay. Children
could choose consummatory or “hot” statements, such as “The marshmallows are
yummy and chewy", task-oriented statements, such as "I am waiting for the marshmallows", or a combination of consummatory and abstract statements, such as "The marshmallows are puffy like clouds". Four-year-old children preferred the consummatory statements which are the least effective strategies for delay but within a year or two chose more effective, task-oriented strategies which overcast rewards and dismiss arousing thoughts about them. In another study, 3 and 6 year old children were asked whether they preferred to look at the real reward or a symbolic representation of it while waiting. The younger children preferred real stimuli over abstract ones and this preference shows their inability to discriminate between effective and ineffective delay strategies (Yates & Mischel, 1979).

However, when kindergartens and 3rd-graders were instructed to use task-oriented self-statements (e.g., "I am waiting for...") both age groups were able to delay longer than in a no verbalization control condition, suggesting again the facilitator role of effective delay strategies (Miller, Winstein, & Karniol 1978).

Conclusions

The review reveals a pattern of evidence that is difficult to explain due to conflicting results. Several studies show an increase in compliance with mother's requests from 18 to 30 months in laboratory situations (Howes & Olenick, 1986; Vaughn et al., 1984). In other studies, however, mother reports (Gralinski & Kopp, 1993), laboratory observations (Schneider-Rosen & Wenz-Gross, 1990), and home observations (Howes & Olenick, 1986) do not always reveal consistent evidence for an increase in compliance
during this age-period. Rather these studies agree that compliance ought to be considered in terms of situational demands.

Similarly, the findings of studies that looked at children 2.5 years and older are conflicting. Holden and West (1989) showed an increase in compliance from 2.5 to 3.5 years in the lab and Power et al. (1994) supported the increase for the age span 2-4 years at home. However, longitudinal, naturalistic data from Kuczynski and Kochanska (1990) found no change in compliance from 2.5 to 5 years. In addition, mothers’ reports did not support an overall change in compliance for 2.5 to 4 years old children (Gralinski & Kopp, 1993).

Recently, Kochanska and her colleagues (e.g., Kochanska & Aksan, 1995; Kochanska, Aksan, & Koenig, 1995) proposed that the contradictory findings in the development of compliance may be in part due to the failure to operationalize compliance. Kochanska proposed that compliance should be viewed as either committed or situational. The first refers to “self-regulated and internally driven compliance” which is evident when children “appear to endorse, embrace, and accept parental agendas as their own.” The latter, refers to compliance that “lacks sincere commitment and requires parental control,” although children may seem cooperative in general. Kochanska reported longitudinal data that support an increase in committed compliance and a decrease in the situational compliance during the period of 33 to 46 months. These findings are consistent with the prediction of Kopp’s developmental model of behavioral self-regulation. Children after the age of 2 begin to make the transition from other- to self-regulation.
These findings are also related to the findings of Gralinski and Kopp (1993) who also provided data on compliance without intervention. Gralinski and Kopp, however, showed that the increase in committed compliance is context specific. Children in this study needed external support to wait or to participate in family routines, although they functioned independently in terms of property and safety rules.

The evidence is particularly interesting and invite further investigation. First, it is worth replicating the age effect on committed compliance in a different sample. In Kochanska et al.'s (1995) study, the age range may be too great at both times (time I: 26-41 months; time II: 43-56 months). As a result, there was a number of children of similar age at both testing times. This could potentially underestimate the self-regulatory ability of older children. Second, it is worth replicating the effect of context on committed compliance. Does compliance without intervention increase from 3 to 5 years? Do older children comply to all rules in all contexts without intervention from the caregiver?

Regarding the ability to delay, the few studies that exist so far agree that there is an increase from 1.5 to 3 years (Howes & Olenick, 1986; Vaughn et al., 1984) which possibly continues through the late preschool and early grade school years. All of these studies however, employ external rewards to motivate children to delay and often external support, usually the mother who remains in the room. Therefore, this kind of task may not be appropriate to test self-regulation of behavior. The task should involve instructions that require the child to delay as a way to show compliance to some rule. The goal should be to observe whether the child has internalized the rule and can readily
apply it by waiting alone in the room. A reward may be applied to motivate the young child but an alternative to waiting should also be given. For example, the child may be asked to complete an easy but boring task while waiting for the experimenter to return to the room and deliver the delayed prize.

The present study aims to clarify these issues by applying this new methodology: a boring sorting task in the presence of toys. This task is a combination of compliance and delay task. It requires the child to comply by working on the task, and avoiding the toys; it also requires the child to delay playing with the attractive toys until the experimenter returns to the room. In addition, mothers and teachers will be asked to rate the children’s compliance to a variety of rules as in the case of Gralinski and Kopp (1993) to account for context effects, too.

**SUMMARY**

The conceptual framework of the present study is based on Kopp’s (1982) developmental model of behavioral self-regulation where behavioral self-regulation is viewed as the ability to regulate behavior in an adaptive and flexible way. It is defined as the manifestation of many behaviors such as compliance, delay of gratification, ability to act in accordance with social norms in the absence of external monitors, and ability to quickly regulate behavior according to changing situations (Kopp, 1982).

There are several theoretical assumptions that are adopted in the present study:

1. Socialization agents, primarily, the caregivers, play an important role in the development of behavioral self-regulation in preschool children. Caregivers influence this process by their behavior, discipline strategies, decisions about specific standards of
behavior that need to be communicated, when standards should be communicated, and 
in general, how to move their children toward compliance and internalized acceptance 
of standards. However, the children's developmental level also influences the 
caregiver's practices.

(2) The development of behavioral self-regulation during the preschool period 
parallels the growth of cognitive skills. In particular, attending to, representing, 
comprehending, internalizing, and executing rules are crucial cognitive processes 
underlying the development of behavioral self-regulation.

(3) It is believed that there is a progression from external to internal factors that 
govern self-regulation; from other- to self-regulation\(^1\). Regulation that is internally 
motivated, is considered a behavior of a higher level. Therefore, compliance to rules 
without the intervention by an external source is considered self-regulatory behavior of 
high level.

(4) An age-related increase in the capacity to self-regulate is expected during the 
preschool years. However, the literature review did not always support this prediction 
and it is essential to replicate the findings using a different methodology.

There is one more assumption that the present study embraces. According to 
Kopp (1989), behavioral self-regulation is considered a different development from 
emotional self-regulation, although it is believed that at some point in life the two merge 
and emotional self-regulation significantly influences the regulation of behavior (Kopp, 
1982;1989). This assumption is discussed in detail in the next chapter.

\(^1\)This does not imply that children once they achieve self-regulation, they never look for 
support in others.
CHAPTER 3: THEORETICAL BACKGROUND OF EMOTIONAL SELF-REGULATION

The growth of emotional self-regulation is closely related to the ability of behavioral self-regulation. Young children must learn standards of behavior and expectations for appropriate behavior in specific situations (e.g., putting toys away after playing with them), as well as the acceptable arousal level (emotion) that conventionally goes with them (e.g., putting toys away with positive, neutral, or minimally distressed emotional feeling and expressions) (Kopp, 1982).

Children must learn how to modulate their emotions according to the demands of circumstances. Kopp (1989, 1992) defined such modulation as the process that aims to maintain a balance among positive, neutral, and negative emotions, and to inhibit anger reactions to unfavored requests for compliance. According to Kopp, emotional self-regulation is a different process from behavioral self-regulation, but the two are linked at some point during development. When this linkage occurs, the child becomes capable of adopting standards for behavior with a relatively agreeable affect.

Kopp speculated that the linkage emerges in the third year of life or later, although there is no empirical evidence to support this claim. It is expected, however, that significant associations could be found between indices of behavioral and emotional self-regulation. Moreover, it is reasonable to expect that such associations would be stronger in older children. None of the studies so far has attempted to investigate these issues. This study aims to shed some light in the potential joint developmental trajectory of behavioral and emotional self-regulation.
In the sections that follow, several theories of emotional self-regulation are, first, addressed. These theories are influenced by different views and working definitions of emotional development. Both early and contemporary approaches of emotional development and regulation are described, along with the predictions they make about the development of emotional regulation. Second, several precursors of emotional self-regulation are identified, such as parental support and cognitive mechanisms. Finally, a review of developmental data of emotional self-regulation, as indexed by coping skills and expressive control of emotions, is provided.

**HISTORICAL AND THEORETICAL BACKGROUND IN THE STUDY OF EMOTIONAL SELF-REGULATION**

Learning theorists provide one of the earlier explanations of emotional development. Watson, for example, proposed that humans experience three innate and discrete emotions, fear, rage, and love, and that all emotional responses to new stimuli can be learned through classical conditioning. By associating the appearances of a furry white rat with a loud, fear-eliciting sound, Watson produced a fear reaction to the rat in a 9-month-old baby. This fear was later generalized to other white furry objects (Watson & Raynor, 1920).

In the 1950s and 1960s, the paradigm of operant conditioning became the focus of attention. A number of studies showed that infants’ smiling and crying could be manipulated through application of reinforcers and punishment (Malatesta, Culver, Tesman, & Shepard, 1989).

The behavioral perspective of emotional regulation is largely dependent on the consequences of emotional responses. Punishment and reinforcement can potentially
shape and control the expressions of emotional reactions. This theoretical account is limited because some emotional responses emerge spontaneously without any prior association with unpleasant experiences. In addition, behavioral explanations do not examine when and how children initiate self-regulation of emotions. From their point of view, regulation of emotions is hardly a self-generated process.

Bridges (1931, 1932) provided a different account of emotions. Extensive observations of infants led her to believe that emotions are not discrete but undifferentiated. She also proposed that emotional development consists of a decrease in the intensity of emotional responses, the expression of emotions in appropriate situations, and a gradual change in the nature of the overt responses. In other words, Bridges suggested that regulatory processes are important part of emotional development. She further attributed these regulatory changes to maturation and conditioning.

Although the influence of Watson’s and Bridges’s work was rather brief, they provided the early foundations on emotional development. The idea that emotional development consists of a process of classical and operant conditioning was abandoned as empirically ungrounded. Most recently, organizational models of emotional development have emerged, that emphasize the nature of emotions (discrete vs. undifferentiated), the functional and adaptive functions of emotions, and the role of emotions in regulating the individual and its behavior (Malatesta et al., 1989).
Contemporary approaches in the study of emotional self-regulation

Contemporary theories consider emotions as central forces in virtually all aspects of human behavior (Kopp, 1989). Contrary to earlier approaches, contemporary theorists emphasize that emotional development includes increasing regulation over the experience and expression of affect, as well as developmental changes in the ways that affect is regulated. For example, at first, infants modulate emotional arousal by looking away or engaging in mouthing and sucking. As motor development proceeds, infants can approach or withdraw from an emotion-arousing stimulus in response to their affective state. Later on, the emergence of representation and language provides additional means for controlling emotional experience and expression (Kopp, 1989).

Contemporary theories generally state that emotional self-regulation is a result of the interaction of several systems of the organism. Dodge (1989), for example, proposed that an individual’s reactions to emotional arousal results from the coordination of three componential systems: "neurophysiological-biochemical" (e.g., heart rate), "motor- or behavioral-expressive" (e.g., facial expressions), and "subjective-experiential or cognitive" (e.g., cognitive efforts to alter states of arousal). Dodge defined emotional self-regulation "as the process by which activation in one response domain serves to alter, titrate, or modulate activation in another response domain. Modulation can occur through attenuation of a response, enhancement of a response, or a transformation of a response process. Control of responding in one domain often requires intervention by another domain" (Dodge, 1989).
Consistent with the organizational view of development, Sroufe (1996) emphasized the coordination of several advances in the affective domain such as increasing self awareness, differentiation of the self, and increasing capacity to tolerate arousal. These developmental changes affect the emotional experience of children in terms of variety of emotions and degree of intensity. For example, a toddler may experience terror or joy to a degree that would have been entirely disorganizing earlier.

Along these lines, Kopp (1989) proposed that emotional regulation involves the interaction of several mechanisms of the child, such as “behavioral schemes” aiming to change or reduce arousal levels, preadopted programs (biologically species specific programs) and cognitive mechanisms, such as learning cause and effect relationships and planning actions.

Kopp emphasized the connectedness of emotional regulation to cognitive ability. She predicted that emotional regulation advances as children develop more cognitively. Initially, children possess only “preadapted mechanisms”, such as shutting the eyes, head turning, and non-nutritive sucking. Older infants develop “elemental” cognitive mechanisms such as making associations between current self-needs and state goals. For example, a fussing baby is comforted at the sound of footsteps, because it signals the presence of the caregiver. According to Kopp (1989), elemental mechanisms are involved in emotional regulation during infancy and early childhood. Other mechanisms such as organization, planfulness, and monitoring are used only by preschoolers and older children to regulate emotions.
It also appears that these mechanisms allow emotional regulation that is self-regulated rather than being externally-monitored. However, Kopp, emphasized that even when children are capable of higher levels of emotional regulation they might as well look for the support of external monitors (e.g., caregivers) under certain circumstances.

What are the mechanisms that allow infants and preschoolers to emotionally regulate themselves? Theorists have proposed mechanisms that provide external support, such as parental assistance and internal support, such as diverting attention. The following section reviews several of these mechanisms.

**Precursors of emotional self-regulation**

Children rely on external or internal support to regulate their emotions. Infants and toddlers are assisted more by extrinsic agents mainly parents. Neurophysiological and cognitive advances enable preschoolers and middle-age children to rely more on themselves. This does not imply, however, that children entirely abandon the assistance of extrinsic agents. Based on both sources of support, children develop strategies to cope with their emotions. Coping skills are considered an important index of emotional self-regulation. The following paragraphs address the issue of what enables children to regulate emotions and how they cope with emotional arousal.

**External support: socialization agents**

Emotional regulation is embedded in social interactions. Children who are able to recognize and produce emotions clearly, but are unsuccessful in inhibiting or regulating the timing or conditions under which they express emotions, will not become effective social partners.
Parents help children in developing skills for regulating their emotions in a variety of ways. Parke (1994) suggested two main socialization routes: (a) socialization occurs indirectly or directly in the course of dyadic interaction between the child and adults, siblings, or peers. Parents transmit rules about emotional regulation and teach how to label emotional states; (b) socialization occurs when parents regulate opportunities for children to learn about emotions (e.g., parents may expose boys to negative emotions more than girls).

Denham (1989) clearly demonstrated how mothers affect emotional regulation of children. Happy emotional displays by the mother were correlated with child’s happy displays, and negatively correlated with both sad and angry emotional displays by the child. In contrast, maternal anger was negatively correlated with the child’s happy emotions and positively correlated with the child’s sad and tense or afraid emotions. Children’s anger tended to be correlated with maternal anger. Furthermore, negative maternal emotions were negatively correlated with the child’s social emotional competence but they were positively correlated with the child’s expression of negative feelings. Conversely, positive maternal emotions were positively correlated with the child’s expression of positive emotions.

Parents may be also the primary agent of socializing emotional expression. Halberstadt (1984) found that when the family environment is low in expressiveness, individuals become sensitive to the most subtle displays of emotions in order to relate effectively with other family members. As a consequence, these individuals become less skilled in expressing emotions but more skilled in perceiving emotion. When the family
environment is high in expressiveness, individuals do not have to work hard to perceive the emotional states of family members; thus, these individuals become more skilled in expressing emotions but are less skilled in perceiving emotion.

Malatesta and Haviland (1982) also studied the socialization of emotional expressions by observing the facial expressions of mothers and their infants in dyadic interactions. In particular, they investigated whether mothers provide instruction in display rules by modeling and contingent responding, and whether mothers respond to changes in emotional expressions of their infants (3-6 months of age). Infants' expressions changed at a rate of 7-9 s, at least as measured during face-to-face interaction. This suggests that mothers have multiple opportunities to respond to infant emotion and possibly shape it. Indeed, mothers showed a rate of change of affect similar to the rate found in infants.

Moreover, mothers responded with more modeling to the positive emotions of their infants such as interest and surprise and they avoided negative expressions that could influence the infant. Mothers also made contingent facial change responses to at least 25% of infant facial expression changes. Thirty-five percent were matching responses, but the majority, or 65%, were dissimilar responses. The time interval between the maternal expression change and the infant expression change was less than half a second which is the optimal range for instrumental conditioning.

Malatesta and Haviland (1982) showed that the socialization of emotion expression begins during early infancy as mothers selectively respond to their infant’s displays in ways that influence the child’s learning of appropriate display rules.
However, it is important to point out that socialization practices of the parents are often influenced by the temperamental characteristics of the children (Kochanska, 1993). In addition, socialization must be adjusted to the individual child's capabilities. Infants with developmental delays, cognitive deficits, or other anomalies would pose more obstacles to optimal emotion socialization since they would be less responsive and manageable.

For example, when comparing full-term and pre-term infants with their mothers, Malatesta, Grigoryev, Lamb, Albin, and Culver (1986) found that mothers of preterm babies displayed significantly less matching or imitation of their infant's facial expressions, showed random rather than contingent responsiveness to sadness, and ignored the infants' anger. These differences were attributed to differences in gazing patterns and negative emotion expression in preterm babies.

Furthermore, mothers and fathers may make different contributions to the development of emotional regulation of their children (Parke, 1994). It is possible that emotional understanding is learned in mother-child interactions because mothers tend to provide more emotional labeling. On the other hand, it is possible that learning to regulate one's own level of arousal in response to the partner's level of arousal, and to regulate one's own level of stimulation are important skills that may be learned, in part, in the context of physical play, which tends to occur more with fathers.

In addition, children's responses are sensitive to the social context which also may affect socialization strategies. More needs to be learned about how children modify their emotions across different settings and partners (Parke, 1994).
Another line of research has emphasized the effectiveness of parenting strategies in the socialization of emotional regulation. Gianino and Tronick (1988) proposed that parental responsiveness may foster children’s ability to regulate emotions. It is assumed that children’s interactions with responsive parents create a feeling of shared, positive emotional states. Out of these interactions children develop a sense of effectiveness that transfers to other social interactions.

Finally, Hardy, Power, and Jaedicke (1993) have recently reported an association between parenting and the variety of coping strategies available to school-age children. In particular, children whose parents were supportive, responsive and accepting, and provided a less structured home exhibited the greatest repertoire of coping strategies. Moreover, parental responsiveness and acceptance was associated with the child’s preference of avoidance strategies in uncontrollable situations and highly structured environment was correlated with less aggressive coping reactions.

**Internal support systems**

**Attention**

Emotion is regulated by managing the input of information that is emotionally arousing. This is achieved by effectively directing attention (Thompson, 1994). Maturation of the visual cortex allows infants to shift attention among stimuli and consequently, to voluntarily disengage from emotionally arousing stimuli (Rothbart, Ziaie, & O’Boyle, 1992). This new development allows parents, too, to use visual distraction as a means of regulating the child’s emotions.

Visual behavior is also important in regulating interpersonal interactions. Gazing communicates attention and interest in interaction. Gaze aversion or visual disengagement
may be problematic for social interaction but it may be functional in filtering out overwhelming stimuli.

Cortez and Bugental (1994) examined visual behavior in 5- and 10-year-old children. The researchers supported the hypothesis that visual avoidance comes under the control of cognitive structures such as perceived level of control. In this study, presence of threat cues led to higher levels of visual disengagement among children with low perceived control or children who were primed for low control. Five-year-old children with high primed control showed more visual attentiveness neutral expressive reactions.

Young children may also cover their eyes and ears to distract themselves from emotionally aversive situations or they may entirely abandon the upsetting situation (Altschuler & Ruble, 1989). Attention based strategies have also been observed in infants and preschoolers in the presence of adults fighting with each other (Cummings & Cummings, 1987).

In situations involving delayed rewards, redirection of attention away from the reward while awaiting is commonly observed in children between the ages of 2 and 6. (Mischel & Mischel, 1983; Vaughn et al. 1986). Attention can be redirected internally by cognitive effortful processes such as thinking about pleasant thoughts or efforts for self-coaching (Band & Weisz, 1988). Behavioral distraction, such as doing something else that takes the mind off is another attention strategy that is observed in middle childhood (Altschuler & Ruble, 1989).
Communication and language skills

Discussing emotions seems to play a significant role in the socialization of emotional regulation. Through language children receive information about their emotions and regulatory strategies. Parents label and interpret emotions. They help children become aware of and understand emotional states, emotional signals, the origins of emotions as well as the shifts from one emotional state to another (Dunn, Bretherton, & Munn, 1987). Parents also foster children’s consciousness of the strategies they use (e.g., the parent may say: “Yesterday, you felt better, when you did... you might try this again”; Thompson, 1988).

Dunn and Brown (1991) have further suggested that children’s ability to discuss their own emotional states gives them some degree of “communicative power and persuasion” (p. 91). Talking about emotions draws attention to their emotional needs and this results in eliciting comfort or aid by using others or by concealing or deceiving them about their own state.

The emergent role of language in the child’s emotional self-regulation has received considerable theoretical attention. As noted earlier, Vygotskian perspectives portray the development of inner speech as an important constituent of self-regulation. However, there is not any empirical evidence that tests the connection between emotional self-regulation with inner speech. This is unfortunate, because children spontaneously use language to manage their emotions. It is not uncommon to hear preschoolers to try to soothe themselves.
Neurophysiological constituents

Whether regulation is through internal or external influences, the capacity to regulate emotions depends on the neurophysiological processes by which an individual organism can inhibit emotion (Sroufe, 1996). If the neurophysiological regulators are impaired or not fully developed, then the individual will rely only on extrinsic assistance.

In the newborn, these mechanisms are rather immature. At birth, diffuse excitatory processes are controlled by the sympathetic nervous system and subcortical structures. However, remarkable changes in the central nervous system continue to take place during the first two years (Thompson, 1988). The excitatory processes decline in lability throughout the first year. This results from postnatal changes in the hypothalamic-pituitary-adrenocortical system that controls reactions to stress. The parasympathetic nervous system and higher-order cortical processes, especially the frontal lobes, slowly develop and myelinate in order to take over the regulatory functions. Cortical inhibitory controls over arousal emerge gradually during infancy, although some do not become fully functional until long after birth. By 9-10 months, maturation of the frontal lobe and its links to response inhibition fosters the capacity for arousal regulation and efforts to cope with emotionally arousing events. Beyond this, there are notable changes in brain organization, particularly in the integration of the two limbic systems (Schore, 1994). Both the lateral tegmental (inhibitory) circuit and ventral tegmental (excitatory) limbic circuits mature, thus, enabling the individual to delay responses as well as to shift emotional responses rapidly.
The parasympathetic system and the cortical structures related to the sympathetic system are maintained in balance by catecholamines. This allows the shift from one system to the other. Schore believes that those shifts are important for the recovery from the state of inhibition to a more positive state.

COPING AND EMOTION REGULATION

The ability to emotionally regulate the self is largely a function of coping strategies to deal with an emotionally demanding situation (Derryberry & Rothbart, 1988; Lazarus & Folkman, 1984). Rossman (1992) proposed that emotional regulation should be considered to be virtually synonymous to coping skills for two reasons: (a) definition similarity. Emotion regulation has been defined as “the control of emotional experience and expression by the self and others” (Campos et al., 1989) and coping has been defined as “a wide range of cognitive and behavioral strategies that have both problem-solving and emotional regulating functions” (Folkman & Lazarus, 1988); (b) both emotional regulation and coping are effortful processes involving the regulation of arousal due to internal and external stimuli.

At the most general level, coping has been considered to include all responses to stressful events or episodes. Coping has been further differentiated on the basis of (a) effortful versus noneffortful responses, (b) functions of coping and coping strategies, and (c) a focus on resources and styles (Compas, 1987).

Effortful responses. Effortful coping, here, is distinguished from processes that are beyond the individual’s volitional control. Therefore, any reflexive or automatic responses are excluded. Purposeful responses, however, may become automatic after being repeated.
many times. Furthermore, coping is not limited to successful efforts (Compas, 1987). Lazarus and Folkman’s (1984) define coping as an effortful process: “we define coping as constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (p. 141).

**Functions of coping and coping strategies.** There are two theoretical perspectives related to the coping functions of adults: “ways of coping model” and “primary-secondary control” (Band & Weisz, 1988). The first model identifies specific strategies that are classified as either problem-focused coping (efforts to manage or modify the source of the problem) or emotion-focused coping (efforts to manage and reduce emotional distress) (Lazarus & Folkman, 1984). The primary-secondary model distinguishes between two relatively broad approaches: primary control which is coping that aims at “influencing objective conditions or events” and secondary control which is coping that aims at “maximizing one’s goodness of fit with conditions as they are” (Band & Weisz, 1988).

In comparing the two models, it appears that the primary-secondary model provides a framework of thinking about broader strategies while it emphasizes the goals of underlying behaviors. An important implication for applying the model with preschoolers is that young children must accurately perceive a situation and set clear goals for action. The ways of coping model, on the other hand, provides a framework for thinking about an array of specific strategies and emphasizes more the variety of strategies. This model also assumes that the selection of specific strategies depends on
the perceived demands of particular situations. As Band and Weisz note, the two models
do not compete but rather complement each other.

Hobfoll, Dunahoo, Ben-Porath, and Monnler (1994) proposed a dual-axis model of
coping by adding a social dimension. The model is based on the premise that healthy
coping is active (problem-solving oriented) and prosocial. The proposed model has two
axes: prosocial versus antisocial and active versus passive. These axes present dimensions
of general coping strategies and not particular behaviors. Finally, this model deemphasizes
the emotional aspects of coping upon which other models give great emphasis (e.g.,

A slight variation of the dual-axis model was provided by Lopez and Little (1996).
Children’s coping varies along the dimensions of activity (direct vs. indirect) and
sociability (prosocial vs. asocial vs. antisocial). Direct action strategies are aimed
specifically at the stressor, while indirect action strategies are aimed at circumventing the
consequences of the stressor. Prosocial coping strategies are aimed at seeking out and
engaging the assistance of others, while antisocial coping strategies are aimed at
aggressively working against others.

Lopez and Little (1994) proposed six broad coping strategies that vary along with
the dimensions of activity and sociability: avoidance (indirect-asocial), emotional support
seeking (indirect prosocial), social exploitation (indirect, antisocial), social cooperation
(direct-prosocial), aggressive individualism (direct-asocial), and hostility (direct-
antisocial).
Children’s use of activity-oriented strategies has been well documented, particularly in response to failure and uncontrollable events (Compas, Banez, Malcarne, & Wossman, 1991; Heckhausen & Schulz, 1995) and further strategies may be classified as either direct or indirect (Berg, 1989). Direct-action strategies include problem-solving, seeking information, assertiveness, and seeking social support (Band & Weisz, 1988; Elias, Gara, Rothbaum, Reese, & Ubriaco, 1987). Indirect action strategies include avoidance, changing one’s own perception, and emotion management (Altshuler & Ruble, 1989; Compas et al., 1991; Curry & Russ, 1985; Weitlieb, Weigel, & Feldstein, 1987).

**Coping resources and styles.** Aspects of coping have been central themes in six areas of research, all concerned with adaptation to stress during childhood and adolescence: attachment and separation during infancy (Sroufe, 1996), interpersonal problem solving (Eisenberg, Fabes, Minore, Mathy, Hanish, & Brown, 1994; Zahn-Waxler, Cole, Richardson, Friedman Michel, & Beloud, 1994), coping in achievement contexts (Garber, Braafladt, & Weiss, 1995), Type A and B behavior patterns (Kliewer, 1991), coping styles of monitoring and blunting (Miller & Green, 1985), and resilience or invulnerability (Radke-Yarrow & Brown, 1993).

There has been little research and theoretical speculation for individual coping styles. One exception is Miller and Green (1985) who distinguished two coping styles: monitors and blunders. For the former, information seeking reduces arousal, but for the latter, increases it. Blunders are more likely to use avoidance techniques.

Finally, research investigating coping during childhood must account for the environmental context in which the stressful episode occurs (including both the nature of
the stressor and the availability of resources for coping), the individual’s developmental level, the personal resources the individual brings to the situation, the prior history of and preferred ways of coping, and the actual coping responses.

The assessment of coping skills involves important methodological considerations, including measurement and temporal versus cross-situational consistency. In much of the work on children’s strategies for dealing with social problem situations strategies have been assessed by presenting children with hypothetical situations, such as having to interrupt an enjoyable activity and go to bed and asking them to verbally report how they would behave in such circumstances (e.g., Zahn-Waxler et al., 1994). This method elicits responses from all children to the same social situations (allows control of the stimuli to which children respond) and it is economical for the time and resources needed to collect the data. However, verbal assessments of children’s responses may pull for higher level reasoning than is actually used in real life situations. In addition, they may tap the child’s ability to construct or consciously select a strategy (Mize & Ladd, 1988).

Enactive procedures for assessing young children’s strategies (i.e., having children act out strategies with puppets) is an alternative approach. Enacted responses are more likely to elicit emotions and therefore are more realistic (e.g., Eisenberg et al., 1994). Perhaps, the better alternative is to observe the coping strategies of children either in natural settings or experimental conditions. Interviews with the children would also yield important information about children’s strategies (Gunther, 1992).

Some debate exists in the literature as to whether dispositional or situational measures of coping are more appropriate (Lazarus, 1990). This debate is centered around...
whether coping behaviors exhibit temporal versus cross-situational consistency (Compas, Forsythe, & Wagner, 1988). In an examination of temporal and cross-situational consistency in causal attributions in response to stress, Compas et al., (1988) found moderate temporal consistency (same coping response to the same stressor over time) and low cross-situational consistency (same behaviors in response to different stressors).

Finally, an interesting question that arises is when coping strategies emerge and how they become available to young children. The following paragraphs review relevant studies to the development of coping skills during preschool and middle childhood.

**THE DEVELOPMENTAL COURSE OF EMOTIONAL SELF-REGULATION DURING PRESCHOOL YEARS**

Generally speaking, emotion regulation research during infancy and early childhood highlight the importance of several categories of coping behaviors as well as the expressive control of emotions. Coping categories include behaviors which withdraw attention from a distressing stimulus or avoid it, behaviors which act on or modify the stressor, behaviors that self-soothe, and behaviors that elicit the assistance of others. The expressive control of emotions is usually indexed by discrete facial expressions and overall rating of emotional state.

Gianino and Tronick (1988) have summarized research dealing with how 3 to 9 month old infants cope with distress elicited by mothers’ still as opposed to normal face, simulated and actual maternal depressive behaviors, and the strange situation. They noted the following types of infant coping strategies: social signaling for a change in interaction; social attending without signaling; physical escape; self-comforting; attending to an alternate object; withdrawal of social engagement; and averting attention.
from the stressor without engaging another object. Ability to use object engagement was reported to become more evident between 4 to 7 months.

Hornik and Gunnar (1988) have noted similar types of coping behaviors shown by 12 to 18 month old in response to an unfamiliar stimulus, such as a caged rabbit. These included seeking caretaker proximity/contact; attempts to distract self; fussing; seeking information; self-stimulation; leave taking; withdrawal from the stimulus or caretaker’s behaviors; and attempts to approach the stimulus to control in a nondirect manner. The problem-oriented strategy of exerting direct control over the stimulus was more frequently observed for older children.

Mangelsdorf et al. (1995) examined infants’ emotion regulation strategies in interaction with strangers. Six-month-old infants used more gaze aversion and fussing than the 12- and 18-month old infants. They were also less likely to use self-soothing (e.g., sucking the thump) and self-distraction (e.g., redirect attention). Eighteen-month-olds made more attempts to redirect the interaction with the stranger such as taking the mother’s hand and pull her toward the stranger.

The above studies have examined infants reactivity to and coping with specific stressful events such as exposure to a stranger, separation from the mother, and exposure to a novel object (e.g., Gianino & Tronick, 1988; Mangelsdorf et al., 1995). Hildebrandt-Karraker, Lake, and Parry (1994) provide a comprehensive view of infants’ (3-18 months) general strategies of coping with a broad range of potentially stressful events such as dirty diapers, teething, parent overstimulation, and change in infant care. The researchers examined five types of coping skills: (1) physiological responding: reactions to stressors
by physical or bodily changes, such as sleep disruption, and defensive facial movements like squinting; (2) emotion-focused independent coping: self-comforting activity, such as thumb or finger sucking and rocking; (3) aided coping: seeking help, comfort, or information from someone else; (4) problem-focused independent coping: attempting to deal with the stressful event itself without help from someone else; and, (5) extreme behaviors that were not clearly directed toward eliminating the stressor, such as hitting, biting, throwing things, and tantrums.

Older infants used a larger number of different coping behaviors to deal with individual stressors. Older infants also were more likely to engage in problem-focused independent coping, aided coping, and extreme behaviors and were less likely to show no attempt to cope or to respond physiologically to stress. Problem-focused coping was more frequent than emotion-focused coping whose frequency was very low and did not change with age.

Hyson (1983) observed 1-, 3-, and 5-year olds as they went through an examination at the doctor’s office. Coping behaviors were coded into three categories: information seeking (try to find out more about the situation), affect management or comfort-seeking (maintain a manageable level of anxiety); and exerting autonomy (acts that increase the area of control). While information-seeking was common across the age span, comfort-seeking decreased somewhat with age, and exerting autonomy increased.

In an observational study, the coping strategies of 2-, 3-, and 4-year olds were observed in a day care setting (Fleury, 1995). Six categories of coping strategies were
used: problem-solving (e.g., take direct action to remove the stressor), social support (e.g., turn to others for advice), escape-denial (e.g., distract, ignore), compliance (e.g., accommodate), aggression (e.g., physical attack), and confrontation (e.g., verbal aggression, commanding).

These categories were, further, classified in terms of the degree of involvement of the teacher in alleviating the upsetting situation: the caregiver solves the problem or initiates help versus the child solves the problem or initiates help. Examples of upsetting situations included becoming a victim of an accident and wanting attention or an object.

The most common coping technique was escape-denial, followed by confrontation, aggression, social support, and problem solving. The least commonly used strategy was compliance. Escape-denial peaked at age 3, problem-solving increased from 2 to 4, aggression declined from 2 to 4 but not significantly, and compliance increased from 3 to 4. Confrontation and social support remained at low frequency and showed no age-related change. In terms of level of caregiver involvement, most of the situations were dealt by the children alone. The cases in which the teacher or the child initiated help were infrequent.

Other studies have examined the expressive control of emotions as well as the factors associated with control of expression along with coping strategies. The methodological model used in these studies is the disappointment paradigm (Saarni, 1984), in which children are asked to rank potential prizes on the basis of preference and then they are given a task to complete. However, after completion, the children receive the least preferable prize instead of the most preferable and their positive (e.g., lip corner pull)
and negative facial expressions (e.g., lip press) are observed. Reactions of the children are also observed when the desired prize is later delivered.

For example, Cole (1986) found that children attempted to control the display of negative emotions with positive expressions and girls did more so than boys. Interestingly, age differences were not found from preschool (M=4.4) to grade school (M=6.8) but there were clear cut gender differences. In fact, girls smiled as much when receiving the disappointment as when receiving the desired prize. However, they expressed more negative emotions when the experimenter was not present.

In another study, the children’s expressive control of emotions was observed in a laboratory situation (Cole, Barrett, & Zahn-Waxler, 1992). The reactions of 2-year-olds were recorded during two mishaps, a doll breaking and juice spilling, in which the children did not intend any wrong doing. The analysis of emotional reactions demonstrated that most 2-year-olds expressed relatively well-modulated negative emotion, and that their distress varied along two dimensions. One dimension appeared to reflect a degree of general tension that suggested an evolving frustration. The second dimension appeared to reflect a sad demeanor and was associated with corrective attempts. Full expressions of sadness, fear, or anger, even surprise were uncommon, and despite the clearly negative emotional reactions, their reactions were regulated and did not interfere with their ability to continue a free play activity. Even children who were high in the frustration dimension appeared regulated.
Conclusions

In terms of the expressive control of emotions, the studies reviewed above, support that children are aware of display rules, although it does not seem that any age-related changes are expected at least during the transition from preschool to grade school. An important supplement to these studies would be to observe both the expressive control of emotions and the behavioral efforts of the children to control emotions or their coping strategies. Unfortunately, none of the studies has done this so far and the proposed study aims to fill this gap in the literature.

The review suggests that even very young children have a great repertoire of coping strategies such as self-comforting, seeking support, distraction, avoidance. The studies provide evidence of problem-focused strategies in 18-month-old infants (Hilderbrandt-Karraker et al., 1994; Hyson, 1983). Withdrawal and avoidance are especially popular among infants. In terms of age-related changes in coping strategies, the studies support that self-soothing behaviors dramatically decline by 18 months.

There is a dearth of studies examining age-related changes in the coping skills of preschoolers. Based on the two studies reported here (Fleury, 1995; Hyson, 1983), children between the ages 3 and 5 show a greater preference for avoidance and distraction coping strategies, thus, continuing the pattern seen during toddlerhood. However, these strategies tend to decline (although not significantly) after age 3. Preschoolers also tend to respond aggressively and vent their emotions when upset, although, these type of reactions tend to decrease. Preschoolers also begin to develop

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2 There are numerous studies, however, about age-related changes in the coping skills of grade-school children (e.g., Altshuler & Ruble, 1989; Band & Weisz, 1988).
strategies that aim toward solving the upsetting situation. This is not surprising considering the developmental strides children make in the cognitive and social domain (Achenbach, 1982). Finally, social support also declines from 3 to 5 years of age. The increase in problem solving and the decrease in social support suggests that as children grow older they tend to rely more on themselves than others (Fleury, 1995). This finding is supported by the Kopp’s theoretical model of emotional self-regulation.

Because of the limited number of studies that examined the development of coping skills in children from 3 to 5, it is important to further investigate this issue. The present study examined age-related changes of coping skills in eight different situations. In addition, age-related changes in the expressive control of emotions during an emotionally arousing experimental condition were investigated.

SUMMARY

The theoretical basis of this research is based on contemporary models of emotional self-regulation. Emotional self-regulation is defined as the increasing ability to modulate the subjective experience and expression of affect. It is believed that the development of emotional self-regulation is the result of the interaction of several systems in the organism, including the biological predispositions, cognition, and social interactions.

Emotional self-regulation is usually measured by the emotional expressions of children and their coping strategies in upsetting situations. The types of behaviors noted by the coping researchers are similar to the behaviors noted by Kopp (1989) in summarizing the growth of emotional regulation. Kopp speculated a progression from
preadopted mechanisms and simple associations to the emergence of planful behaviors at age 2 to 3 years. Five types of regulatory behaviors stand out: visual averting or physical avoidance behaviors (closing eyes or turning away); distraction behaviors (playing with a toy); self-soothing behaviors (thumb sucking or stroking); problem-oriented behaviors (attempts to remove a barrier to a toy); and behaviors which elicit assistance from others (crying or approaching the caretaker). The little evidence that exists suggests that preschoolers use some of these strategies as well, namely avoidance, problem solving, and asking for support. However, more studies are needed to replicate and expand the existent evidence and the present study aims to do so.

The development of emotional self-regulation is considered an important contributor to the development of behavioral self-regulation. As Kopp suggested (1989, 1992), it is desirable that children learn to regulate their behavior (e.g., comply and delay) while at the same time they modulate their emotional arousal (e.g., excitement, distress). She has also proposed that these two developments converge at about the age of 3 when children begin to accept and internalize behavior standards with agreeable degree of affect. Unfortunately, there is no empirical evidence directly bearing on this hypothesis, despite its importance in the socialization of preschool children. Therefore, it is critical not only to examine the association between self-regulation and emotion regulation but also to investigate age-related changes in the association.
CHAPTER 4: SPECIFIC AIMS

The present research investigated the developmental course of self-regulation by: (a) investigating the development of behavioral self-regulation in preschool children aged 3 and 5 years; (b) investigating the development of emotional self-regulation during the same period; and, (c) demonstrating that emotional self-regulation facilitates the development of behavioral self-regulation, and that there are age-related changes in the relationship between behavioral and emotional self-regulation.

Taking Kopp's developmental perspective, behavioral self-regulation, as indexed by compliance and ability to delay, was expected to increase with age due to increasing socialization forces, and the growth of cognitive skills (e.g., attention, representation, comprehension, internalization of standards of behavior, and rule execution). A progression from external to internal factors that govern self-regulation was expected; from other- to self-regulation. Regulation that was internally motivated, was considered a behavior of a higher level. Therefore, compliance to rules without external intervention was considered self-regulatory behavior of high level.

The prediction of an age-related increase in behavioral self-regulation, however, is not fully supported in the literature. Studies that look at age-related changes in compliance of 18- to 30- month old children either show an increase (Vaughn et al., 1984) or conclude that the increase is a function of contextual demands (Gralinski & Kopp, 1993; Howes & Olenick, 1986). Data from children between 2.5 to 5 years of age are conflicting, too. Some researchers report an increase in compliance (Holden & West,
1980) whereas other studies show no change at all (Gralinski & Kopp, 1993; Kuczynski & Kochanska, 1990).

The conflict in the literature might be due in part to a failure to examine the developmental paths of different forms of compliance; compliance that is externally versus internally regulated. When this differentiation is made, the findings appear clearer. For example, Kochanska et al. (1995) found that situational compliance (compliance that requires parental control) decreased with age while committed compliance (self-regulated, internally driven) increased with age during the preschool period. Gralinski and Kopp (1983), however, showed that the increase in committed compliance was context specific. Children in that study needed external support to wait or to participate in family routines, although they functioned independently in terms of property and safety rules.

The evidence is particularly interesting and invites further investigation. First, it is worth replicating the age effect on committed compliance in a different sample. In Kochanska’s study, the age range might have been too great at both times (time I: 26-41 months; time II: 43-56). As a result, there was a number of subjects of similar age at both testing times. This could have potentially underestimated the self-regulatory ability of the older children. Second, it was worth replicating the effect of context on self-regulated compliance. Does compliance without intervention increase from 3 to 5 years? Do older children comply to all rules in all contexts without intervention from the caregiver?
Regarding the ability to delay, the few studies that exist so far agree that there is an increase from 1.5 to 3 years (Howes & Olenick, 1986; Vaughn et al., 1984) which may continue through the late preschool and early grade school years. All of these studies, however, employed external rewards to motivate children to delay and often the mother remained in the room to offer support. Therefore, external support built into the task might have been inappropriate to test self-regulation of behavior. To test behavioral self-regulation, the task should involve instructions that require the child to delay as a demonstration of compliance to some rule. The goal should be to observe whether the child has internalized the rule and can readily apply it by waiting alone in the room. A reward may be applied to motivate the young child but an alternative to waiting should also be given. For example, the child may be asked to complete an easy, boring task while waiting for the experimenter to return and deliver the delayed prize.

The present study aims to clarify these issues by applying this new methodology; a boring sorting task in the presence of attractive, distracting toys. This task is a combination of a compliance and a delay task. It requires the child to comply by working on the task, and avoiding the toys; it also requires the child to delay playing with the attractive toys until the experimenter returns. A variation of this task has been used with 18 to 24 month old children in a study by Kochanska and Aksan (1995). In that experiment, the mother was in an adjacent room which was separated by a short gate and the children were allowed to visit their mother during the experimental session. In the present study, the experimental conditions were stricter in an effort to adequately operationalize self-regulated compliance.
In addition to the observed behaviors on the task, mothers rated the children's compliance to a variety of rules formulated by Gralinski and Kopp (1993). An adaptation of the scale was given to teachers as well. Both scales required mothers and teachers to decide whether children needed their intervention to follow the rules or not (indicating internalization of standards of behavior).

The present research also examines the development of emotional self-regulation. Emotional self-regulation was measured by two indices: (a) the emotional comfort of children during the experimental task, and (b) the child's coping strategies in upsetting situations as rated by mothers and teachers. The literature review showed that even very young children have a repertoire of various coping strategies, such as self-comforting, seeking support, distraction, avoidance, and problem solving (Hilderbrandt-Karraker et al., 1994; Hyson, 1983). By the end of toddlerhood, self-soothing behaviors decline dramatically while distraction and avoidance prevail. The evidence for the development of coping skills in the preschool period, however, is very limited. The existing evidence suggests a decline in avoidance/distraction and aggression/venting. Problem-focused strategies increase whereas seeking social support declines, thus, suggesting that as children grow older they tend to rely more on themselves than others (Fleury, 1995). These findings are consistent with Kopp's theoretical model of emotional self-regulation.

The present study examines age-related changes in a range of coping strategies, including avoidance/distraction, aggression, venting, seeking support, and instrumental coping (independent problem-solving). In addition, the strategy of cognitive
restructuring was examined. Cognitive restructuring reflects attempts to change the way one thinks of an upsetting situation (Eisenberg, et al., 1994). For example, a 4-year-old, whose favorite toy just broke may attempt to think about it in a positive way, saying "it was just a toy". This strategy has often been examined in middle childhood. Although, one may expect little evidence for cognitive restructuring in 3-year-olds, pilot data of this research showed otherwise. While other strategies are more frequently reported, mothers and teachers of preschoolers who were asked to rate the frequency of cognitive restructuring reported that it was not unusual.

In order to provide a comprehensive assessment of emotional self-regulation, the overall degree of emotional comfort during the experimental task was rated. In addition, the children were interviewed after the task to determine what efforts they made to stay on the task despite their desire to play with the toys.

The development of emotional self-regulation has been considered a major factor in the development of behavioral self-regulation. As Kopp suggested (1989, 1992), it is desirable that children learn to regulate their behavior (e.g., comply and delay) while at the same time they modulate their emotional arousal (e.g., excitement, distress). She has proposed that these two developments converge at about the age of 3 when children begin to accept and internalize behavior standards with agreeable degree of affect. Unfortunately, there is no empirical evidence bearing on this hypothesis, despite its importance in the socialization of preschool children. Therefore, it was critical not only to examine the association between self-regulation and emotional self-regulation but also to investigate age-related changes in the association.
The present study investigated whether and how the ability to emotionally regulate the self is associated with behavioral self-regulatory behaviors such as compliance. For this purpose, the demand of emotional regulation during the sorting task was manipulated by hiding the attractive toys (low demand condition) or exposing them (high demand condition). Previous research has shown that exposing the desirable toy or food to children decreased the time they could wait for it (Mischel, 1983; Reitman 1987). Therefore, it was expected that exposing the toys would create a situation that was emotionally more arousing and demanding. It is worth noting, however, that such manipulation imposes demands on the children other than emotional. Cognitive demands, such as being able to direct attention away from the toys or being able to concentrate on the task, are in play along with being able to regulate desire to play with the toys.

It was predicted that during the 3-5 year period, the association between emotional and behavioral self-regulation would become stronger. In other words, it was expected that older children would be better able to emotionally regulate themselves, and consequently, they would perform better on the compliance task, regardless of the external demands of emotional regulation. An interaction between age and the emotional component of the task was also predicted. The performance of younger children was expected to be affected significantly more by the demands for emotional self-regulation. In addition, the relationship between measures of behavioral and emotional self-regulation were examined. Significant correlations between indices of behavioral and emotional self-regulation were expected.
In summary, the present study had the following objectives: (a) investigate the development of behavioral self-regulation in preschool children aged 3 and 5 years; (b) investigate the development of emotional self-regulation during the same period; (c) demonstrate that emotional regulation assists in the development of behavioral self-regulation, and examine age-related changes in the relationship between behavioral and emotional self-regulation

The following predictions were made:

1. Behavioral self-regulation was expected to increase with age during the preschool years. Five-year-olds were expected to comply more (task and ratings) than 3-year-olds.

2. Emotional self-regulation was also expected to increase. Five-year-olds were expected to employ more independent types of coping skills such as instrumental coping and cognitive restructuring (ratings). Their emotional comfort was expected to be greater throughout the experimental task.

3. A strong association between behavioral and emotional self-regulation was expected. The relationship was predicted to be stronger in the high demand condition. Five-year-olds were expected to perform better than the 3-years-olds regardless the experimental condition. However, younger children were expected to be affected significantly more by the demands for emotional regulation.
CHAPTER 5: METHOD

PARTICIPANTS

Participants of the study were 101 preschoolers aged 3 and 5 years, their mothers and teachers. The children were recruited from Preschools and Day Care centers from the Baton Rouge metropolitan area. After receiving permission from the directors of the schools, a letter of participation along with two copies of the consent form (Appendix A) were sent to the parents. The only criterion of selecting the recipients of the invitation was the age of the child. However, children who had an identified disorder that was known to the director of the school were not included.

Of all the children who participated, 10 3-year-olds and 3 5-year-olds failed to complete the procedures. The remaining 88 children belonged in two distinctive age groups. The younger group included 43 children aged an average of 3.25 years (range: 2.26-3.73 years) from whom 19 were boys (mean: 3.19, range: 2.26-3.62) and 25 were girls (mean: 3.29, range: 2.85-3.73). The 3-year-old group had an average of 1.49 years of preschool attendance.

A total of 45 children participated in the older age group. The average age was 5.14 years (range: 4.69-5.99). Twenty four were boys (mean: 5.17, range: 4.69-5.99) and 21 were girls (mean: 5.11, range: 4.75-5.91). The 5-year-old group had an average of 3.46 years of preschool attendance.

The children were predominantly from Caucasian (96.6% Caucasian; 3.4% Asian), middle-class families. The majority of mothers and fathers of both age groups reported a professional occupational status (Table 1).
Table 1. Sample demographic characteristics

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Note: *The demographic data sheet is presented in Appendix B; b n=43; c n=45.
In addition, the majority of mothers and fathers of both age groups had at least a college degree (Table 1). Ninety-three percent of the 3-year-olds and 98% of the 5-year-olds came from intact families. The mean age of mothers and fathers of the 3-year-olds was 38.88 and 37.16, respectively. The mean age of the mothers and fathers of the 5-year-olds was 34.93 and 36.73, respectively. Finally, the majority of both 3- and 5-year-olds had at least one sibling (Table 1).

**Overview of measures**

Various measures were completed by the mothers, the teachers, and the experimenter. For presentation, the measures are grouped into three types: (1) measures of behavioral and emotional self-regulation during the experimental task; (2) measures of behavioral and emotional self-regulation based on questionnaires; (3) interview after the task.

**Measures of behavioral and emotional self-regulation during the experimental task**

Measures of behavioral self-regulation included scoring of observational categories during an experimental compliance task. Measures of emotional self-regulation included a rating of emotional comfort during the observational task. First, the description of the observational task is given.

**Observational task**

All children participated in two experimental conditions that involved a boring sorting task (sorting spoons and forks out of a big box) in the presence of attractive toys that were either visible or not visible to the children. The condition in which the toys were visible was assumed to be emotionally more demanding and was named the high demand condition. The task in which the toys were not visible was the low demand
condition. All children experienced both conditions. To avoid order effects (Greenwald, 1976) the order of conditions was counterbalanced. The time interval between the two conditions was 7.18 days (range 4-14) for the 3-year-olds and 7.42 days (range: 4-14) for the 5-year-olds. All procedures were video-taped by a hidden camcorder.

**Setting-Procedure**

The children were randomly called by the experimenter who took them to a room in the same school building that was used as a laboratory. The experimenter spent some time with the children before data collection begun for children to become acquainted with her.

The room contained a cardboard panel that covered the camcorder, some boxes with cutlery, and a bookcase with several attractive toys. The sorting task was placed out of line of sight of the toys so that children had to turn their heads to see them directly. The camera was placed approximately 10' from the midpoint of a line between the bookcase and the sorting task (Figure 1).

Two sets of toys were used. One set (toyset A) included a Fisher Price garage, a race car with remote control, a doll house with little furniture and people, a Fisher Price circus train, a small doll in her crib, a jewelry box with adult jewelry, a 3-d puzzle, an explorer’s watch, and a spring ball. The second set (toyset B) included several cars that made sounds, airplanes, a big doll in a crib, two smaller dollys, a Fisher Price school, a Dalmatian book with music buttons, a pin sculptor, a tree house with little people, and a toy eyeball. The sets of toys were counterbalanced for order. In each age group, half children experienced first the high demand condition with toyset A, and the low demand
condition with toyset B second. The rest half experienced the low demand condition with toyset A first, and the high demand condition with toyset B second.

![Experimental set-up](image)

**Figure 1.** Experimental set-up

**Instructions**

Different instructions were given to the children, according to the experimental condition.

**Low demand task**

The experimenter showed the toys to the child but did not comment on the attractive characteristics of them. “Look what I have here, but do not touch. These toys are for you to play but first I would like you to do something.”

The experimenter then led the child to the box with the cutlery. Only the back of the bookcase was visible to the children from this position. “Here I have a whole bunch of spoons and forks that are all mixed-up! I would like to put the forks in one box (the experimenter places a fork in one box) and the spoons in another (the experimenter places a spoon in the other box) and I would like you to help me do it while I am working in the next room. I would like you to keep working until I come back. After I
come back you can play with the toys. Now, I want you to show me how you will put the spoons and forks in the boxes. All right! Good job! Keep working until I come back.”

The experimenter returned to the room after 10 minutes. The experimenter then allowed the child to play with the toys for 5 minutes.

High demand task

Similar instructions were given in the high demand condition. The experimenter showed the toys to the child but also commented on the attractive characteristics of them. For toyset A the experimenter commented: “Look what I have here! These are some really fun toys. A doll house with little people and furniture in it, a red car that moves forwards and backwards, turns, and has its lights on when moving. Look at this fun garage! It has an elevator just for little cars like these... And this circus train that has animals aboard. These toys are for you to play but first I would like you to do something.” For toyset B, the experimenter commented: “Look what I have here! There are some really fun toys. A big pretty dolly and two little ones in a crib that you can change their cloths, a book about Dalmatians that plays music, a whole bunch of little cars that make real car noises and airplanes! Look at this fun school and the little people! You can even play basketball with the little people in the school-yard.”

In the high demand condition the cutlery remained the same, but the toys were different, and the bookcase was turned 180° so that the toys were visible to the children. The experimenter returned to the room after 10 minutes. The experimenter then allowed the child to play with the toys for 5 minutes.
Whenever the sorting task was given for the second time, the experimenter, after presenting the toys, commented “Remember what you did to help me last time? I would like you to do it again. Here I have more spoons and forks and I would like you to put them in the boxes. Show me how you are going to do it. Very good! Keep working until I come back. When I am back you can play with the toys.” If the child did not remember the procedure the experimenter would repeat the instructions described above.

The children were not told about the hidden camera to prevent them from discussing it with other children before the end of the project.

**Coding of behavioral self-regulation**

The index of behavioral self-regulation used in these tasks was the child’s compliance to the instructions in the absence of the experimenter. Empirical evidence of the construct validity of compliance has been provided by numerous studies that demonstrated a link between oppositional behavior and behavioral problems such as aggression and conduct disorders (e.g., Patterson, 1982).

Three levels of compliance were calculated according to the reactions of children to the rules of staying on task and not playing. At the first level of compliance, the time spent sorting cutlery was calculated. None of the rules is violated at this level. Two codes were assigned at this level: serious sorting which refers to sorting cutlery in a serious plain way and playful sorting which refers to sorting that becomes an entertaining activity (e.g., spoons and forks fly like airplanes before they are dropped in the boxes).
The second level compliance refers to the time spent on activities that violate the rule of sorting. The codes assigned at this level were: **material play** which refers to the time playing with the cutlery without sorting (e.g., fit the spoons in one another), **look at toys** either from close or far distance from the toys, **table do nothing** which refers to the time spent sitting on the table without sorting or looking at the toys, and **room do nothing** which refers to wandering around the room but not looking at, touching, or playing with the toys. In material play the focus is on the task, in looking at the toys the focus is on the toys, and in table do nothing and room do nothing the focus is neither on the task nor the toys.

The third level of compliance refers to the time spent on activities that violate both of the rules of working and not playing. **Gentle touch** refers to gentle and tentative touch of the toys that lasts at least 2 s. **Toy play** refers to playing with the toys in an unrestrained and manipulative way (e.g., lifting and turning the toys).

Finally, compliance was measured by calculating the **time until the first toy contact**. This measure indicates a level of resistance before violation of the rule avoid the toys occurs.

All of the codes were duration codes and were measured in seconds. Duration has been used in several studies as an index of compliance (e.g., Kochanska & Aksan, 1995). The end of each code was determined by the qualitative change in the child's behavior. However, rules were also established to increase the reliability of the coding. For example, material play was coded after the child held the cutlery for more than 3 s.
before sorting. The software PSCODE (Karadimitriou, 1997) was used to facilitate the
coding procedure. Analytical description of the coding system is given in Appendix C.

Finally, the number of incorrect responses (e.g., number of spoons in the box
with the forks) was calculated as an indication of accuracy on the sorting task. Overall,
children were highly accurate and therefore, accuracy was not used to exclude children
from the study.

**Coding of emotional self-regulation**

During the observational task, emotional regulation was measured by rating the
children’s expressive emotional comfort. The rater assigned a number from 1 to 5 based
on a set of guidelines developed to increase reliability of the rater’s judgment. The
degree of emotional comfort was rated after the experimenter watched and coded each
video-taped segment. The rating reflects a measure of expressing both positive (e.g.,
happiness) and negative emotions (e.g., stress). The rating system is as follows:

1 = least comfortable. The children look very sad and unhappy to be there, may cry, look
frustrated, and may wait by the door for extensive period of time. Thumb sucking is
very likely.

2 = less comfortable. The children do not cry but they look sad or frustrated, may go to
the door several times or look at the door a lot.

3 = comfortable. The children seem OK. They are neither sad nor happy. They may
attempt to go out once.

4 = very comfortable. The child is comfortable but not excited to be there. The child
looks rather tired or bored.
5 = very very comfortable. The children are excited to be there. They do not look bored nor tired. They seem to enjoy being in the situation. They may sort cutlery or play with the toys but they seem to be perfectly happy to be by themselves.

**Measures of behavioral and emotional self-regulation based on rating scales**

Behavioral self-regulation was measured by mother and teacher ratings of children's compliance to a broad range of rules. Measures of emotional regulation were provided by mothers' and teachers' ratings of children's reactions to upsetting hypothetical scenarios.

**Rating scales of behavioral self-regulation**

The mothers of the children completed a checklist developed by Gralinski and Kopp (1993) which has also been used by Kochanska (1995). The scale includes categories of standards of behavior that have derived from mothers' responses to open-ended questions about prohibitions and requests given to their children.

Eight categories of behavioral standards are included in the checklist: (a) “child safety” which “refers to protecting children from their own acts” (e.g., not touching dangerous objects); (b) “protection of personal property” which “involves safeguarding other's possessions from children's intrusiveness, exploration, or inadvertent destructiveness” (e.g., not tearing up books) (c) “respect for others” which refers to “transmission of information related to the expression of prosocial behavior and the control of aggression” (e.g., not taking toys away from other children); (d) “food and mealtime routines” which refers to “eating habits and eating etiquette” (e.g., not playing with food); (e) “delay” which “involves children's waiting for attention” (e.g., not interrupting other's conversations); (f) “self care” which “centers around activities
related to children's personal care and hygiene” (e.g., dressing-up); (g) “manners” which refers to “attempts to make the child behave politely” (e.g., saying please); and (h) “family routines” which refers to “activities that contribute to a neat and orderly house” (e.g., putting toys away).

Individual items grouped by category are shown in Appendix D. The mothers were asked to rate their children’s responses to rules on a four-point numerical scale as follows: 1 = never conforms, 2 = conforms only with intervention, 3 = conforms sometimes without intervention, and 4 = conforms mostly without being reminded.

Compliance was scored by averaging ratings for all items on the entire scale; relatively high compliance scores presumably reflect greater internal regulation of behaviors than relatively low scores, which presumably reflect external regulation of behaviors.

A slightly modified version of the same checklist was given to the teachers as well. In the teachers’ version, one item of the self-care category (item 21: brushing teeth when requested) was excluded. Moreover, two items from the category of family routines and two items from the delay category were reworded to fit to school activities (item 13: waiting when mom is on the phone was changed to waiting when teacher is busy; item 15: waiting for a meal was changed to waiting for a turn; item 22: going to bed when requested was changed to taking a nap when requested; and item 24: keeping room clean was changed to keep classroom clean; see Appendix D).
Rating scales of emotional self-regulation

Coping behaviors were assessed by using an extension of the rating scales developed by Eisenberg (see, Eisenberg, Fabes, Bernzweig, Karbon, Poulin, & Hanish, 1993; Eisenberg et al., 1994).

Eisenberg’s scale includes a global measure of coping skills and three scenarios. The global scale contains the following 13 types of coping behaviors: (1) instrumental coping; (2) emotional intervention; (3) instrumental aggression; (4) avoidance; (5) distraction; (6) venting; (7) emotional aggression; (8) cognitive restructuring; (9) emotional support; (10) cognitive avoidance; (11) instrumental intervention; (12) instrumental support; and (13) denial.

In Eisenberg’s studies, this scale was completed by teachers and mothers who were asked to rate from 1 to 7 the likelihood that the child responded in each of above ways when confronted with an upsetting situation. In addition, mothers and teachers were presented with three scenarios (Eisenberg et al., 1994) and were requested to rate (on the same 1-7 scale) the likelihood of the children’s responding in each of the first nine types of coping listed above, as well, as doing nothing. The scenarios depicted a child hurt or angry because a peer purposely knocked over the block tower he or she was building, or because he or she was excluded from peers’ play, or was made fun of by peers.

Using composite scores of the mothers, Eisenberg performed correlational analyses that reduced the types of coping strategies into 6 categories: distraction/avoidance (cognitive avoidance, distraction, denial); aggression
(instrumental aggression, emotional aggression); venting (venting, emotional intervention); seeking support (emotional support, instrumental intervention, instrumental support); instrumental coping; and, cognitive restructuring. In this study, the internal validity of the scales was examined and data reduction was performed in order to check whether the same 6 categories would emerge or further reduction was possible.

In addition to Eisenberg’s global scale and three scenarios, five more scenarios were generated (Appendix E). These additional scenarios were necessary because Eisenberg’s rating scales involved only peer situations. It is possible that children’s reactions to these peer situations have little predictive value of their reactions to the experimental conditions of the present research. Therefore, it was important to broaden the range of upsetting situations in order to obtain a better representative picture of children’s coping strategies.

The additional scenarios include situations in which children are upset because (a) a favorite toy is accidentally broken; (b) they cannot put a puzzle together; (c) they must interrupt a favorite activity to do something else; (d) they want a toy they cannot have; and (e) a favorite toy is lost. For each scenario, there are 10 items same to those used by Eisenberg in her three scenarios. The eight scenarios and the global scale were given to teachers and mothers (Appendix E).

**Interview after the task**

Finally, children were interviewed after the task to determine what they did and thought that helped them stay on the task. The interviews were given only after the
second condition. The children were asked: (a) whether they liked working with the
spoons and forks, (b) whether they wanted to play with the toys while they were
working, (c) whether it was hard waiting, (d) what they did or thought to help them
wait, and (e) whether they touched the toys. Children were also asked to rate how strong
they felt about their positive or negative answers (Appendix F).
CHAPTER 6: RESULTS

OVERVIEW OF ANALYSES

The analyses are organized in five major sections. The first section presents the procedures of data reduction, preliminary analyses, and validity/reliability checks of the instruments and coding. Because the large number of variables would produce a great number of statistical analyses that consequently would create redundancy and increase the overall Type I error (Glass & Hopkins, 1996), it was necessary to collapse the variables. Visual inspection of the data and factor analysis were used to reduce the observation and questionnaire variables. Preliminary analyses examined the effects of gender and its interaction with age and experimental condition. Analyses were also conducted to evaluate the effectiveness of counterbalancing the order of experimental conditions (low vs. high emotional demand), and toysets (A and B). Finally, the intercorrelations between the task variables (6 observational categories and 1 rating) were examined in order to evaluate the validity of the coding system. The internal consistency of the coping and compliance questionnaires was examined. The interobserver agreement was also analyzed and reported.

The second section presents the results from the repeated measures analysis of covariance (ANCOVA) involving the observational task variables after they were reduced (work on task, material play, look at toys, do nothing, play with toys, time until first toy contact) and the rating of emotional comfort. The effects of age (3- vs. 5-year-olds), experimental condition (low vs. high emotional demand), and order (first vs. second) were examined.
The third section presents the results from the multivariate analyses of variance (MANOVAs) involving the coping and compliance questionnaires as well as the interview analyses. The effects of age and gender were examined. In addition, the correlations between ratings and performance on task were analyzed. The fourth section presents the correlations between the indices of emotional and behavioral self-regulation. Finally, the fifth section includes the summary and conclusions from all the analyses.

All reported effects were significant at the alpha level of .05. Significant interaction effects were followed-up by analyses of simple effects to search for the locus of the interaction. (Keppel, Saufley, & Tokunaga, 1992). All statistical tests were contacted in SPSS/PC (SPSS Inc., 1996).

DATA REDUCTION-PRELIMINARY ANALYSES-VALIDITY/RELIABILITY

Data reduction

Questionnaire variables

To decrease redundancy and increase statistical power, the number of the coping categories was reduced. The variables from the coping questionnaires included a total of 14 categories: instrumental coping, emotional intervention, instrumental aggression, avoidance, distraction, venting, emotional aggression, cognitive restructuring, emotional support, do nothing, cognitive avoidance, instrumental intervention, instrumental support, and denial. The first 10 types of coping were included in the scenarios.

Cronbach’s alphas (α) were computed for each one of the 10 items (i.e., coping strategies) across the eight scenarios in order to examine the consistency of each item. For the mothers’ data these alphas ranged from .76 to .88. The avoidance item had an
alpha of .59 and was excluded from further analyses. A minimum cut-off score of .60 was considered appropriate in order to maintain alphas at a level similar to those reported in the coping literature (e.g., Eisenberg et al., 1993; Eisenberg et al., 1994). For the teachers’ data, the alphas for each one of the items across the 8 scenarios ranged from .74 to .92 (Table 23, Appendix G).

The high alpha values permitted averaging the scores across the eight scenarios. Therefore, 9 mean scores were created for the mothers’ ratings and 10 for the teachers’ ratings. Further, data reduction was completed by factor analyzing the items from the scenarios and from the global scale (9 scenario and 14 global items for the mothers’ data; 10 scenario and 14 global items for the teachers’ data). Separate analyses were conducted for the mothers’ and teachers’ data. The Kaiser-Meyer-Olkin measure of sampling adequacy indicated that factor analysis was appropriate (mothers’ data KMO = .64; teachers’ data KMO = .76) (Kaiser, 1974).

The Oblimin rotation was performed because it was expected that the factors would be correlated. In addition, several items were excluded because their interpretation was ambiguous in that they loaded on several factors. Scenario item 10 and global items 13 and 14, all referring to do nothing as a coping strategy, were first eliminated from the analyses. Scenario item 1, referring to cognitive restructuring was also excluded. When these items were removed, four factors clearly emerged in both mother and teacher data sets (Tables 2, 3). The first factor, called Aggression included instrumental and emotional aggression. The second factor, Instrumental Coping, included coping strategies that focus on solving the problem. The third factor called
Venting included emotional intervention and venting from both scales. Items regarding avoidance and distraction loaded on the fourth factor called Avoidance (Table 2).

Table 2. Factor loadings of individual items of the mothers’ coping ratings

<table>
<thead>
<tr>
<th>Item</th>
<th>Aggression</th>
<th>Instrumental Coping</th>
<th>Venting</th>
<th>Avoidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global-Q3 - instrumental aggression</td>
<td>.87</td>
<td>.05</td>
<td>.06</td>
<td>.11</td>
</tr>
<tr>
<td>Scenario-Q3 - emotional aggression</td>
<td>.85</td>
<td>-.13</td>
<td>-.19</td>
<td>-.04</td>
</tr>
<tr>
<td>Scenario-Q9 - instrumental aggression</td>
<td>.76</td>
<td>.05</td>
<td>-.23</td>
<td>.13</td>
</tr>
<tr>
<td>Global-Q9 - emotional aggression</td>
<td>.71</td>
<td>-.21</td>
<td>-.19</td>
<td>.05</td>
</tr>
<tr>
<td>Global-Q1 - instrumental coping</td>
<td>.30</td>
<td>.69</td>
<td>.19</td>
<td>-.22</td>
</tr>
<tr>
<td>Global-Q12 - instrumental support</td>
<td>-.15</td>
<td>.67</td>
<td>-.15</td>
<td>.11</td>
</tr>
<tr>
<td>Global-Q11 - instrumental intervention</td>
<td>-.07</td>
<td>.65</td>
<td>-.25</td>
<td>.11</td>
</tr>
<tr>
<td>Scenario-Q8 - instrumental coping</td>
<td>-.02</td>
<td>.65</td>
<td>.09</td>
<td>-.27</td>
</tr>
<tr>
<td>Global-Q10 - cognitive restructuring</td>
<td>.01</td>
<td>.58</td>
<td>.10</td>
<td>-.37</td>
</tr>
<tr>
<td>Scenario-Q5 - emotional support</td>
<td>-.17</td>
<td>.50</td>
<td>.02</td>
<td>.11</td>
</tr>
<tr>
<td>Scenario-Q7 - venting</td>
<td>.08</td>
<td>-.02</td>
<td>-.81</td>
<td>-.00</td>
</tr>
<tr>
<td>Global-Q2 - emotional intervention</td>
<td>.15</td>
<td>.02</td>
<td>-.79</td>
<td>-.07</td>
</tr>
<tr>
<td>Scenario-Q4 - emotional intervention</td>
<td>.08</td>
<td>-.03</td>
<td>-.76</td>
<td>-.13</td>
</tr>
<tr>
<td>Global-Q8 - venting</td>
<td>.08</td>
<td>-.08</td>
<td>-.72</td>
<td>-.07</td>
</tr>
<tr>
<td>Global-Q7 - emotional support</td>
<td>-.01</td>
<td>.28</td>
<td>-.47</td>
<td>.11</td>
</tr>
<tr>
<td>Global-Q6 - avoidance</td>
<td>-.11</td>
<td>.08</td>
<td>-.14</td>
<td>-.89</td>
</tr>
<tr>
<td>Global-Q5 - distraction</td>
<td>-.19</td>
<td>-.01</td>
<td>-.28</td>
<td>-.84</td>
</tr>
<tr>
<td>Global-Q4 - avoidance</td>
<td>.02</td>
<td>-.05</td>
<td>.10</td>
<td>-.56</td>
</tr>
<tr>
<td>Scenario-Q2 - distraction</td>
<td>.15</td>
<td>.44</td>
<td>.26</td>
<td>-.45</td>
</tr>
</tbody>
</table>

| Eigenvalue | 4.83 | 3.29 | 1.95 | 1.51 |
| Cumulative % | 25.4 | 42.8 | 53.1 | 61.1 |

A difference between the mothers and teachers was found in the factor loading for the item emotional support. Emotional support was perceived by mothers as a strategy for emotional intervention while teachers perceived it as a problem-focused strategy (Tables 2, 3). The factor configuration for both data sets was based on the
loadings. In addition, the order in which the factors appeared in the teachers' data was Instrumental Coping, Venting, Aggression, and Avoidance.

Table 3. Factor loadings of individual items of the teachers' coping ratings

<table>
<thead>
<tr>
<th>Item</th>
<th>Instrumental Coping</th>
<th>Venting</th>
<th>Aggression</th>
<th>Avoidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global-Q11-instrumental intervention</td>
<td>.85</td>
<td>.21</td>
<td>.03</td>
<td>-.04</td>
</tr>
<tr>
<td>Global-Q1 - instrumental coping</td>
<td>.76</td>
<td>-.22</td>
<td>.12</td>
<td>-.04</td>
</tr>
<tr>
<td>Global-Q12 - instrumental support</td>
<td>.73</td>
<td>.08</td>
<td>.02</td>
<td>.18</td>
</tr>
<tr>
<td>Global-Q7 - emotional support</td>
<td>.68</td>
<td>.21</td>
<td>-.30</td>
<td>-.14</td>
</tr>
<tr>
<td>Scenario-Q8 - instrumental coping</td>
<td>.67</td>
<td>-.31</td>
<td>-.05</td>
<td>-.03</td>
</tr>
<tr>
<td>Global-Q10 - cognitive restructuring</td>
<td>.62</td>
<td>-.29</td>
<td>.03</td>
<td>.32</td>
</tr>
<tr>
<td>Scenario-Q5 - emotional support</td>
<td>.58</td>
<td>.04</td>
<td>-.10</td>
<td>.00</td>
</tr>
<tr>
<td>Scenario-Q4 - emotional intervention</td>
<td>-.11</td>
<td>.91</td>
<td>.02</td>
<td>.04</td>
</tr>
<tr>
<td>Scenario-Q7 - venting</td>
<td>-.01</td>
<td>.90</td>
<td>.13</td>
<td>-.04</td>
</tr>
<tr>
<td>Global-Q8 - venting</td>
<td>-.05</td>
<td>.85</td>
<td>-.00</td>
<td>-.19</td>
</tr>
<tr>
<td>Global-Q2 - emotional intervention</td>
<td>.19</td>
<td>.83</td>
<td>-.00</td>
<td>.12</td>
</tr>
<tr>
<td>Global-Q3 - instrumental aggression</td>
<td>.00</td>
<td>-.05</td>
<td>.93</td>
<td>-.03</td>
</tr>
<tr>
<td>Scenario-Q9 - instrumental aggression</td>
<td>.08</td>
<td>.13</td>
<td>.91</td>
<td>.01</td>
</tr>
<tr>
<td>Scenario-Q3 - emotional aggression</td>
<td>-.07</td>
<td>.04</td>
<td>.90</td>
<td>.02</td>
</tr>
<tr>
<td>Scenario-Q9 - emotional aggression</td>
<td>-.05</td>
<td>-.03</td>
<td>.84</td>
<td>-.16</td>
</tr>
<tr>
<td>Scenario-Q6 - avoidance</td>
<td>.16</td>
<td>.05</td>
<td>-.14</td>
<td>.82</td>
</tr>
<tr>
<td>Global-Q5 - distraction</td>
<td>-.12</td>
<td>-.10</td>
<td>-.21</td>
<td>.80</td>
</tr>
<tr>
<td>Global-Q6 - cognitive avoidance</td>
<td>.06</td>
<td>-.22</td>
<td>-.19</td>
<td>.70</td>
</tr>
<tr>
<td>Scenario-Q2 - distraction</td>
<td>.41</td>
<td>-.13</td>
<td>.15</td>
<td>.62</td>
</tr>
<tr>
<td>Global-Q4 - avoidance</td>
<td>-.12</td>
<td>.19</td>
<td>.14</td>
<td>.51</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>6.32</td>
<td>3.06</td>
<td>2.68</td>
<td>2.08</td>
</tr>
<tr>
<td>Cumulative %</td>
<td>31.6</td>
<td>47.0</td>
<td>60.4</td>
<td>70.8</td>
</tr>
</tbody>
</table>

The mother and teacher compliance questionnaires represented a total of eight variables: child safety, delay, food and mealtime routines, family or school routines, manners, protection of personal property, respect for others, and self-care. Because the categories are conceptually distinct from each other, data reduction was not conducted.
The mean for each one of the categories was calculated and used in the analyses. In addition, a composite score of compliance was created by averaging the mean scores of the eight categories.

**Task variables**

The initial task variables included a rating of degree of emotional comfort and 9 observational categories: playful sorting, serious sorting, material play, table do nothing, room do nothing, gentle touch, toy play, look at toys, and time until the first toy contact (Table 4).

<table>
<thead>
<tr>
<th></th>
<th>3-year-olds (n=43)</th>
<th>5-year-olds (n=45)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Playful sorting</td>
<td>7.37</td>
<td>10.09</td>
</tr>
<tr>
<td>Serious sorting</td>
<td>171.48</td>
<td>166.00</td>
</tr>
<tr>
<td>Material play</td>
<td>42.16</td>
<td>28.46</td>
</tr>
<tr>
<td>Look at toys</td>
<td>31.86</td>
<td>142.88</td>
</tr>
<tr>
<td>Room do nothing</td>
<td>14.41</td>
<td>4.32</td>
</tr>
<tr>
<td>Table do nothing</td>
<td>174.72</td>
<td>97.83</td>
</tr>
<tr>
<td>Gentle touch</td>
<td>3.79</td>
<td>2.97</td>
</tr>
<tr>
<td>Play with toys</td>
<td>135.39</td>
<td>129.53</td>
</tr>
</tbody>
</table>

**Note.** Low: Low demand condition; High: High demand condition.

To guard against inflated Type I error rate and protect the statistical power of the overall analyses, the number of variables was reduced. Inspection of the data indicated
that the duration of playful sorting, room do nothing, and gentle touch was relatively short (range: 46-52 s) as compared to the duration of the other variables (Table 4).

Consequently, these variables were combined with other variables that were operationally and conceptually similar, as follows: Playful sorting was combined with serious sorting into one category designated as work on task. Room do nothing was combined with table do nothing in the category labeled do nothing. Finally, gentle touch and toy play were combined into a new category, play with toys. Therefore, the final set of seven categories included: degree of emotional comfort, work on task, material play, look at toys, do nothing, play with toys, and time until the first toy contact.

Preliminary analyses: observational data

Preliminary analyses were performed using the 7 categories to evaluate gender effects and the interactions between gender, age, and experimental condition. Preliminary analyses also provided statistical evidence of the effectiveness of the experimental manipulation of counterbalancing the order of the experimental conditions and the two toysets. The interactions of order and toyset with age and condition were also examined.

Gender effects

The goal was to examine gender differences in age and condition effects. It was desirable not to find significant gender differences on all of the seven variables in order to eliminate gender from the analyses and maintain an economical design. For the same reason, no interactions between gender and age or condition were expected.

Because all participants experienced both experimental conditions at two consecutive points in time, condition was treated as the within-factor in the analyses. A
series of repeated measures ANOVAs (i.e., Gender X Condition X Age) was then performed with each one of the 7 task variables separately. First, the effects of gender and age (2 between-factors) were examined. Gender did not have a significant main effect on any of the 7 task variables (Table 5). As expected, boys and girls, regardless of their age group or the experimental condition, did not differ in the rated degree of emotional comfort $F(1,84)=.27, p>.05$, work on task, $F(1,84)=.05, p>.05$, look at toys, $F(1,84)=.3.32, p>.05$, play with toys, $F(1,84)=.69, p>.05$, do nothing, $F(1,84)=.22, p>.05$, material play, $F(1,84)=1.56, p>.05$, and in the time until the first toy contact, $F(1,84)=.08, p>.05$ (Table 5). The lack of a gender effect on indices of compliance is consistent with previous findings from observational (Kuczynski & Kochanska, 1990) and experimental studies (Holden & West, 1989) that have included children of a similar age range.

As shown in Table 5, none of the interactions between gender and condition were significant (degree of comfort: $F(1,84)=1.18, p>.05$; work on task: $F(1,84)=1.93, p>.05$; material play: $F(1,84)=.41, p>.05$; look at toys: $F(1,84)=1.68, p>.05$; do nothing, $F(1,84)=.21, p>.05$; play with toys: $F(1,84)=.03, p>.05$; time until the first toy contact: $F(1,84)=.35, p>.05$). Finally, most of the interactions between age and gender were non-significant (degree of comfort: $F(1,84)=.63, p>.05$; work on task: $F(1,84)=1.72, p>.05$; look at toys: $F(1,84)=.41, p>.05$; do nothing, $F(1,84)=1.81, p>.05$; play with toys: $F(1,84)=1.47, p>.05$; time until the first toy contact: $F(1,84)=2.07, p>.05$) except the one for material play, $F(1,84)=4.64, p<.05$ ($\eta^2 = .05, 1-\beta = .56$).
Table 5. Gender effects on the task variables

<table>
<thead>
<tr>
<th>Boys (n=42)</th>
<th>Girls (n=46)</th>
<th>Boys (n=42)</th>
<th>Girls (n=46)</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low demand</td>
<td>High demand</td>
<td>G</td>
<td>GXA</td>
</tr>
<tr>
<td>Degree of comfort</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>4.11</td>
<td>3.82</td>
<td>3.78</td>
<td>3.73</td>
</tr>
<tr>
<td>SD</td>
<td>.94</td>
<td>1.06</td>
<td>1.00</td>
<td>1.16</td>
</tr>
<tr>
<td>E</td>
<td>.608</td>
<td>.430</td>
<td>.280</td>
<td></td>
</tr>
<tr>
<td>Work on task</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>302.71</td>
<td>265.95</td>
<td>245.16</td>
<td>259.04</td>
</tr>
<tr>
<td>SD</td>
<td>195.38</td>
<td>224.75</td>
<td>154.49</td>
<td>197.92</td>
</tr>
<tr>
<td>E</td>
<td>.825</td>
<td>.194</td>
<td>.168</td>
<td></td>
</tr>
<tr>
<td>Material play</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>86.09</td>
<td>53.80</td>
<td>86.26</td>
<td>61.89</td>
</tr>
<tr>
<td>SD</td>
<td>103.93</td>
<td>64.71</td>
<td>105.93</td>
<td>87.29</td>
</tr>
<tr>
<td>E</td>
<td>.215</td>
<td>.034</td>
<td>.522</td>
<td></td>
</tr>
<tr>
<td>Look at toys</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>20.21</td>
<td>16.52</td>
<td>112.69</td>
<td>91.84</td>
</tr>
<tr>
<td>SD</td>
<td>48.49</td>
<td>33.00</td>
<td>97.21</td>
<td>86.19</td>
</tr>
<tr>
<td>E</td>
<td>.072</td>
<td>.522</td>
<td>.199</td>
<td></td>
</tr>
<tr>
<td>Do nothing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>117.04</td>
<td>129.39</td>
<td>82.19</td>
<td>70.67</td>
</tr>
<tr>
<td>SD</td>
<td>163.99</td>
<td>174.85</td>
<td>97.02</td>
<td>103.15</td>
</tr>
<tr>
<td>E</td>
<td>.643</td>
<td>.182</td>
<td>.645</td>
<td></td>
</tr>
<tr>
<td>Play with toys</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>70.33</td>
<td>109.32</td>
<td>65.04</td>
<td>100.47</td>
</tr>
<tr>
<td>SD</td>
<td>152.91</td>
<td>191.36</td>
<td>137.66</td>
<td>190.55</td>
</tr>
<tr>
<td>E</td>
<td>.407</td>
<td>.229</td>
<td>.855</td>
<td></td>
</tr>
<tr>
<td>Time until first contact</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>494.19</td>
<td>461.17</td>
<td>463.52</td>
<td>449.23</td>
</tr>
<tr>
<td>SD</td>
<td>194.82</td>
<td>232.67</td>
<td>202.88</td>
<td>231.67</td>
</tr>
<tr>
<td>E</td>
<td>.773</td>
<td>.154</td>
<td>.554</td>
<td></td>
</tr>
</tbody>
</table>

Note. G = Gender effect, GXA = Gender X Age interaction, GXC = Gender X Condition interaction.

This interaction was further explored in a simple effect analysis. A one-way ANOVA with age as the between-factor was performed for each gender group. The age effect was significant for boys, $F(1,40)=15.86, p<.001$, (3-year-old boys: 27.13, 5-year-
olds boys: 130.45) and girls F(1,40)=4.15, p<.05 (3-year-olds girls: 41.20, 5-year-old girls: 77.66).

Because none of the main gender effects were significant, it seems likely that the Gender X Age interaction for material play was due to sampling error. Thus, the lack of gender effects on compliance made it possible to collapse the data across gender in the subsequent analyses.

Order effects

In the next series of analyses, the effects of order and age (2 between-factors) were examined, (i.e., Order X Condition X Age). The within-factor was again the experimental condition. These analyses were performed in order to examine the effectiveness of counterbalancing the order of the experimental conditions. Half of the children experienced the low condition first and the high condition second. The rest half experienced the conditions in the opposite order. It was expected that no order effects would be found. In addition, any interaction between order and age or condition was predicted to be non-significant.

As expected, there were no significant main effects of order on any of the task variables (degree of comfort: F(1,84)=.06, p>.05; work on task: F(1,84)=.04, p>.05; material play: F(1,84)=.40, p>.05; look at toys: F(1,84)=.02, p>.05; do nothing, F(1,84)=1.26, p>.05; play with toys: F(1,84)=.01, p>.05; time until the first toy contact: F(1,84)=.19, p>.05) (Table 6).

There were, however, several significant interactions. As shown in Table 6, the interaction between order and condition was significant for work on task,
$F(1.84)=32.08$, $p<.001$ ($\eta^2 = .27$, $1-\beta=1$), do nothing, $F(1.84)=4.70$, $p<.05$ ($\eta^2 = .05$, $1-\beta=.57$), play with toys, $F(1.84)=15.02$, $p<.001$ ($\eta^2 = .15$, $1-\beta=.96$), and time until the first toy contact, $F(1.84)=4.29$, $p<.05$ ($\eta^2 = .04$, $1-\beta=.53$).

Table 6. Order effects on the task variables

<table>
<thead>
<tr>
<th></th>
<th>First Order (n=43)</th>
<th>Second Order (n=43)</th>
<th>Second Order (n=45)</th>
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<td><strong>Do nothing</strong></td>
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<tr>
<td>M</td>
<td>94.46</td>
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</tr>
<tr>
<td><strong>Time until first contact</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>504.34</td>
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<tr>
<td>p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.041</td>
</tr>
</tbody>
</table>

Note. Low: Low demand condition; High: High demand condition; O = Order effect, OXA = Order X Age effect, OXC = Order X Condition interaction.

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The Order X Condition interaction for work on task was further explored. A one-way repeated ANOVA with condition as the within-factor was performed for each order separately. The analysis showed a significant effect of condition in the first order, \( F(1,44)=35.35, p<.001 \), (Low: 329.39, High: 216.09). The effect was also significant in the second order but it was in the opposite direction, \( F(1,44)=4.78, p<.05 \), (Low: 242.51, High: 287.13).

The same simple main effect analysis was performed with do nothing as the dependent variable. A significant effect of condition was found for the first \( F(1,44)=26.77, p<.001 \), (Low: 94.46, High: 79.20) and the second order, \( F(1,44)=9.06, p<.01 \), (Low: 151.24, High: 73.26).

The interaction between order and condition for play with toys was also followed-up by a one-way repeated ANOVA with condition as the within-factor. A separate analysis was performed for each order. A main effect of condition was found for the first order, \( F(1,42)=10.99, p<.01 \), (Low: 71.18, High: 104.67). A significant effect but in the opposite direction was found for the second order as well, \( F(1,45)=9.06, p<.01 \), (Low: 109.37, High: 63.40).

The same analysis for time until the first toy contact revealed a main effect of condition for the first, \( F(1,42)=7.35, p<.01 \), (Low: 504.34, High: 447.46) but not the second order, \( F(1,45)=.27, p>.05 \), (Low: 450.73, High: 464.26).

Finally, the interaction between order and age was significant for degree of comfort, \( F(1,84)=4.33, p<.05 \) (Table 6). The simple main effect analysis involving a one-way ANOVA with age as the between factor was performed for each order.
separately. A main effect of age was found for the second order only, $F(1,45)=18.21$, $p<.001$, (3-year-olds: 3.34, 5-year-olds: 4.41), (first order; 3-year-olds: 3.66, 5-year-olds: 4.00).

Overall, the preliminary analyses involving order effects showed no significant main order effects on either one of the task variables, thus supporting the effectiveness of the counterbalancing the order of the experimental conditions. There were, however, significant interactions between order and condition for work on task, do nothing, play with toys, and time until the first toy contact. Analyses of simple main effects revealed that children worked more in the first visit to the lab. Children spent more time doing nothing in the low condition at both testing times. They also played more in the high condition when they experienced the low condition first. However, they played more in the low condition when they experienced the low condition second. The children delayed their first contact with the toys more in the low condition when they experienced the low condition first. Finally, a significant interaction between order and age was found for degree of comfort. Five-year-olds were rated as more comfortable when they were tested for the second time.

In summary, although the pattern of interactions is complex, the main result is that children worked more and played less in the low condition when they experienced it for the first time, whereas the opposite effect appeared were they experienced the low condition for the second time. Because order did not interact with condition and age, it did not seem to be a critical factor in determining evidence for the hypotheses of the
study. However, in order to reduce the variance due to order, order was included as another between-factor in the final analyses.

**Toyset effects**

In the final set of preliminary analyses, the effects of toyset and age (2 between-factors) were analyzed with experimental condition as the within-factor (i.e., Toyset X Age X Condition). It was expected that both of the toysets used in the study were equally attractive to both age groups at both conditions. Therefore, no significant main effects of toyset were expected.

The results showed a main effect of toyset on degree of comfort, $F(1,84)=9.78$, $p<.01$, ($\eta^2 = .10$, 1-$\beta=.87$), indicating that children showed higher degree of comfort when playing with toyset A (Table 7). Further, children worked more on task, $F(1,84)=7.13$, $p<.01$, ($\eta^2 = .07$, 1-$\beta=.74$) when toyset A was used. In contrast, when toyset B was used, children were more likely to do nothing, $F(1,84)=6.28$, $p<.05$, ($\eta^2 = .07$, 1-$\beta=.69$) (Table 7).

Taken together, toyset B was more attractive than toyset A. As shown in Table 7, there were no other main effects of toyset and none of the interactions between toyset and age or toyset and condition were significant, thus supporting the initial prediction.

**Summary**

These preliminary findings determined the nature of the subsequent analyses. Because gender appeared to have no direct effect on the task variables and minimal interactive effects with age and condition, gender was eliminated from further analyses. On the other hand, based on the interactions of order with condition and age, order was
treated as a between-factor in further analyses. Toyset was used as a covariate because of the main effects it had on several of the task variables.

Table 7. Toyset effects on the task variables

<table>
<thead>
<tr>
<th>Toyset</th>
<th>Toyset</th>
<th>Toyset</th>
<th>Toyset</th>
<th>Effects</th>
</tr>
</thead>
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<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>(n=43)</td>
<td>(n=45)</td>
<td>(n=43)</td>
<td>(n=45)</td>
</tr>
<tr>
<td>Degree of comfort</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>4.32</td>
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<td>3.95</td>
<td>3.57</td>
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<td>.99</td>
<td>1.13</td>
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<tr>
<td>p</td>
<td>.002</td>
<td>.225</td>
<td>.135</td>
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</tr>
<tr>
<td>Work on task</td>
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<td></td>
</tr>
<tr>
<td>M</td>
<td>332.32</td>
<td>236.84</td>
<td>291.81</td>
<td>214.77</td>
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<tr>
<td>SD</td>
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<td>206.43</td>
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<tr>
<td>p</td>
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<td>.572</td>
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</tr>
<tr>
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<td>M</td>
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<td></td>
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<td>109.95</td>
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<td>M</td>
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<td>M</td>
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<td>455.31</td>
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<td>237.77</td>
<td>214.84</td>
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<td>p</td>
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<td>.066</td>
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</table>

Note. T = Toyset effect, TXA = Toyset X Age, TXC = Toyset X Condition.
Validity of instruments and coder reliability

Observational coding system

Intercorrelations between the task variables were analyzed in order to examine whether the relationships between the categories were in the expected direction. This evidence provides a validity check of the coding system. The results revealed significant correlations and a pattern of relationships that was consistent between the two experimental conditions (Tables 8, 9).

Table 8. Intercorrelations between task variables in the low demand condition

<table>
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<tr>
<th>Variable:</th>
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</tr>
<tr>
<td>2. Work on task</td>
<td>.45***</td>
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</tr>
<tr>
<td>3. Material play</td>
<td>.02</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4. Look at toys</td>
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<td>-.37***</td>
<td></td>
<td>-.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Do nothing</td>
<td>-.48***</td>
<td>-.53***</td>
<td>-.16</td>
<td>.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Play with toys</td>
<td>.02</td>
<td>-.56***</td>
<td>-.29**</td>
<td>.27**</td>
<td>-.24*</td>
<td></td>
</tr>
<tr>
<td>7. Time until first touch</td>
<td>.06</td>
<td>.55***</td>
<td>.25</td>
<td>-.32**</td>
<td>.13</td>
<td>-.92***</td>
</tr>
</tbody>
</table>

Note: N = 88; *p < .05, **p < .01, ***p < .001.

Table 9. Intercorrelations between task variables in the high demand condition

<table>
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<tr>
<th>Variable:</th>
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<th>4</th>
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<th>6</th>
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<tbody>
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<td>1. Degree of comfort</td>
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<td></td>
</tr>
<tr>
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<td>3. Material play</td>
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<tr>
<td>4. Look at toys</td>
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<td>-.43***</td>
<td>-.31**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Do nothing</td>
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<td>-.49***</td>
<td>-.29**</td>
<td>.53***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Play with toys</td>
<td>.31**</td>
<td>-.52***</td>
<td>-.30**</td>
<td>-.21</td>
<td>-.24*</td>
<td></td>
</tr>
<tr>
<td>7. Time until first touch</td>
<td>.15</td>
<td>.49***</td>
<td>.27</td>
<td>.12</td>
<td>.15</td>
<td>-.79***</td>
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</tbody>
</table>

Note: N = 88; *p < .05, **p < .01, ***p < .001.

Tables 8 and 9 show that, overall in both conditions, the children who were rated as being more comfortable were less likely to look at the toys or do nothing and more likely to work. The children who worked on task were less likely to look at the toys, do
nothing, or play with the toys, and were more likely to delay touching the toys. The children who were involved in material play were less likely to look at the toys, do nothing, or play with the toys and were more likely to delay touching the toys. Children who did nothing were less likely to play with the toys, and finally, children who did not delay the first toy contact were more likely to play with the toys.

**Questionnaires**

At the first level of the analyses, the internal consistency of the compliance and coping scales was examined by computing Cronbach’s alphas. The alphas for the mother and teacher compliance scale were .83 and .92, respectively. According to Nunnally and Bernstein (1994), alphas of value higher than .80 are considered good for internal consistency.

For the coping scales, alphas were computed for each one of the scenarios as well as for the global scale. For the mothers’ scale, the alphas ranged from .61 to .82. The scenario describing a situation in which the child reacts to the termination of a favorite activity had a low alpha of .49 and was excluded from further analyses (Table 24, Appendix G). These alphas were comparable to those found in the coping literature (e.g., Eisenberg et al., 1993; Eisenberg et al., 1994). For the teachers’ scale, the alphas for each one of the scenarios and the global scale ranged from .64 to .70.

**Inter-observer agreement**

Two female undergraduate psychology students who were blind to the hypotheses of the study provided estimates of reliability. Both coders spent approximately 20 hours studying and practicing the coding system. Each one of the coders randomly selected the tapes of 8 3-year-olds and 8 5-year-olds. Both video-taped
experimental conditions were coded for each child. Therefore, each coder observed 32 video-taped segments which is approximately 20% of the total number of segments. There was no overlapping between the segments observed by each coder.

Inter-observer reliability between the experimenter and each one of the coders was completed by calculating Cohen’s kappa coefficients. Because the coding categories reflected duration in time, second by second agreement between the two observers was obtained. The reliability kappa coefficients ranged from .74 to 1.00 (Table 25, Appendix G), thus, demonstrating high inter-observer agreement.

**Summary**

Overall, at the first level of analyses, data reduction was achieved by decreasing the number of the task variables. Moreover, a factor analysis reduced the coping variables to the following four: Aggression, Instrumental Coping, Venting, and Avoidance. All eight compliance categories were maintained.

Each task variable was tested 3 times in a repeated measures ANOVA design with age as one between-factor and gender, or order, or toyset repeatedly as the second between-factor. The within-factor was always condition. The purpose of these preliminary analyses was to detect gender differences and confirm the effectiveness of counterbalancing the order of the experimental conditions and the toysets. The results revealed no gender effects or interactions between condition and gender on any of the 7 variables (Table 4). There were, however, some order and toyset effects that could not be ignored in the final analyses (Tables 5, 6). To account for these effects, toyset was
used as a covariate and order was used as a between-factor. The final analyses are described in the section below.

Finally, the validity of the coding system and the internal consistency of the coping and compliance questionnaires were determined satisfactory. The inter-observer agreement was very high.

ANALYSES OF TASK INDICES OF BEHAVIORAL AND EMOTIONAL SELF-REGULATION

The following sections present the results of the analyses involving the indices of emotional self-regulation (degree of comfort) and behavioral self-regulation (work on task, material play, look at toys, do nothing, play with toys, and time until first toy contact) during the observational task. The effect of age, experimental condition, and order were considered. The effect of age directly addresses the hypotheses regarding the development of behavioral and emotional self-regulation. The effect of condition demonstrates the effectiveness of the experimental manipulation of the low and high demand condition. The interaction between age and condition supports the hypothesis regarding the association between behavioral and emotional self-regulation. Based on the preliminary analyses, order was included as another between-factor while toyset was used as a covariate in all of the analyses.

Age, condition, and order effects

Each one of the 7 task variables was analyzed in a 2X2X2 repeated measures ANCOVA. Condition was the within-factor, age and order were the between-factors, and toyset was used as the covariate3 (i.e., Age X Order X Condition).

3 Because toyset is a dichotomous variable, one could question the statistical conclusion validity of the results from the ANCOVA analyses. However, treating toyset as another between-factor instead of a covariate (i.e., Order X Toyset X Age X Condition repeated...
Toyset was a significant covariate for degree of comfort, $B = -0.54$, $p < 0.01$ ($\eta^2 = 0.11$, $1-\beta = 0.89$), work on task, $B = -0.86$, $p < 0.01$ ($\eta^2 = 0.07$, $1-\beta = 0.73$), and do nothing $B = 0.58$, $p < 0.01$ ($\eta^2 = 0.17$, $1-\beta = 0.73$) (Table 10).

### Table 10. Covariate effects of toyset on task variables

<table>
<thead>
<tr>
<th>Variable:</th>
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<th>SE</th>
<th>$\beta$</th>
<th>$\eta^2$</th>
<th>1-\beta</th>
</tr>
</thead>
<tbody>
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<td>0.16</td>
<td>-0.30**</td>
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<td>0.89</td>
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<tr>
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<td>32.76</td>
<td>-0.24**</td>
<td>0.07</td>
<td>0.73</td>
</tr>
<tr>
<td>Material play</td>
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<td>15.77</td>
<td>-0.15</td>
<td>0.03</td>
<td>0.36</td>
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<tr>
<td>Look at toys</td>
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<td>0.15</td>
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<td>0.24**</td>
<td>0.07</td>
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<td>33.47</td>
<td>0.05</td>
<td>0.003</td>
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<td>-0.08</td>
<td>0.007</td>
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Note. $N = 88$; *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

The analysis of covariance did not change the pattern of effects reported in the preliminary analyses. The adjustment to the means of the between-factors was minimal. For simplicity, the means reported in tables are the observed means.

A significant main effect of condition was found for several task variables, thus, demonstrating the efficacy of the experimental manipulation. As shown in Table 11, all children were rated as more comfortable, $F(1,84) = 3.67, p < 0.05$ ($1-\beta = 0.47$), worked more, $F(1,84) = 5.56, p < 0.05$ ($1-\beta = 0.64$), and were more likely to do nothing, $F(1,84) = 10.83, p < 0.001$ ($1-\beta = 0.90$) in the low-demand condition. On the other hand, all children looked more at the toys, $F(1,84) = 87.16, p < 0.001$ ($1-\beta = 1$) in the high demand condition (Table 11).

Condition contributed 4% to the variance of degree of comfort, 6% of work on task, 50% of look at the toys, and 11% of do nothing. The percentages reflect how much measures ANOVA) yielded identical results. To avoid complex interactions, it was preferable to use toyset as a covariate.
of the difference in the children’s performance between the two conditions can be attributed to the experimental condition.

Table 11. Age and condition effects on task variables

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Note. All the means reported here are the observed means. The adjustment to the means due to the covariate was minimal; Low: Low demand condition; High: High demand condition; A = Age effect, C = Condition effect, AXC = Age X Condition interaction.
A significant main effect of age was found for all of the variables. Five-year-olds were rated more comfortable than the 3-year olds, $F(1,84)=17.43$, $p<.001$ ($1-\beta=.89$). Five-year-olds worked more, $F(1,84)=29.07$, $p<.001$ ($1-\beta=1$), and were involved more in material play, $F(1,84)=20.01$, $p<.001$ ($1-\beta=.99$). In contrast, the 3-year-olds looked more at the toys than the 5-year-olds, $F(1,84)=27.12$, $p<.001$ ($1-\beta=.99$) and played more with the toys, $F(1,84)=8.29$, $p<.001$ ($1-\beta=.81$). Three-year-olds were also more likely to do nothing during the task, $F(1,84)=10.83$, $p<.001$ ($1-\beta=.97$) than the 5-year-olds. Finally, 3-year-olds were more likely to touch the toys for the first time sooner than the 5-year-olds, $F(1,84)=8.44$, $p<.001$ ($1-\beta=.81$) (Table 11). Overall, 40% of the 3-year-olds and 61% of the 5-year-olds completed the procedures without touching the toys [$\chi^2(1, N=88)=9.02$, $p<.01$].

Age differences contributed 11% to the total variance of degree of comfort, 25% of work on task, 19% of material play, 24% of look at toys, 15% of do nothing, 9% of play with toys, and 9% of time until the first toy contact. The percentages represent how much of the difference observed in the performance between 5- and 3-year-olds can be attributed to the age difference.

The effect of the interaction between age and condition was significant for work on task, $F(1,84)=4.13$, $p<.05$ ($\eta^2=.04$, $1-\beta=.51$), look at toys, $F(1,84)=8.67$, $p<.01$ ($\eta^2=.09$, $1-\beta=.82$), and do nothing, $F(1,84)=7.22$, $p<.01$ ($\eta^2=.07$, $1-\beta=.75$) (Table 11). These interactions are discussed in greater detail next.
As can be seen in Figure 2, the age difference in work on task was greater in the low demand condition. A simple main effect analysis involving a one-way repeated ANOVA with condition as the within-factor was performed for each age group.

Figure 2. Age and condition effects on work on task

The results showed a complicated pattern. A main effect of condition was found for the 5-year-olds only, $F(1,44)=6.51, p<.05$, demonstrating that the 5-year-olds worked less in the high condition. The 3-year-olds were not affected by the condition although it was initially predicted that they would be affected more by the high condition. Nevertheless, the significant interaction does support the association between behavioral and emotional self-regulation by showing the differential effect of condition on the 5-year-olds.

Figure 3 shows that the age difference in look at toys was greater in the high demand condition (Figure 3). The simple main effect analysis for each age group
showed that both 3- and 5-year-olds looked more at the toys in the high than the low condition ($F(1,42)=44.41, p<.001$, $F(1,44)=52.83, p<.001$, respectively.

![Figure 3. Age and condition effects on look at toys](image)

The magnitude of the condition effect on the 3-year-olds is congruent with the hypothesis that the 3-year-olds would be affected more by the experimental condition. As shown in Figure 3, the slope describing the performance of the 3-year-olds in the two conditions is steeper than the one of the 5-year-olds.

Finally, the age difference found for do nothing was greater in the low demand condition (Figure 4). The simple main effect analysis supported that the 3-year-olds remained more idle in the low condition, $F(1,42)=12.85, p<.001$. Condition did not have an effect on the performance of the 5-year-olds. These findings support the prediction that the 3-year-olds would be affected more by the experimental condition.
The interaction between age and condition for material play showed a trend, $F(1,84)=3.92, p<.06$ ($\eta^2=0.04, 1-\beta=0.49$). Inspection of the means (Table 11) suggests that the 5-year-olds were involved in more material play in the high demand condition.

There were no significant main effects of order but there was a significant Order X Condition interaction for work on task, $F(1,84)=32.08, p<.001$ ($\eta^2=0.27, 1-\beta=0.96$), do nothing, $F(1,84)=4.70, p<.05$ ($\eta^2=0.05, 1-\beta=0.57$), play with toys, $F(1,84)=15.02, p<.001$ ($\eta^2=0.15, 1-\beta=0.96$), and time until the first toy contact, $F(1,84)=4.29, p<.05$ ($\eta^2=0.04, 1-\beta=0.53$). The results were identical to the order effects found in the preliminary analyses which are shown in Table 6. Finally, there were no significant Age X Order and Age X Order X Condition effects.
ANALYSES OF QUESTIONNAIRE AND INTERVIEW INDICES OF BEHAVIORAL AND EMOTIONAL SELF-REGULATION

Compliance questionnaires

Multivariate analyses of variance (MANOVAs) were performed with the eight compliance categories as the dependent variables and age and gender as the independent variables (Table 12). The same analysis was performed with the mother and teacher data. An age-related increase in compliance was predicted to support the hypothesis of an age-related increase in behavioral self-regulation.

The 8X2X2 MANOVA with the mothers’ data revealed a significant multivariate effect for age, $F(8,77)=2.92$, $p<.01$ (Wilks criterion). Age differences contributed 23% to the variance of compliance ($1-\beta=.93$). Contrary to previous studies that used the same questionnaire as here (Gralisnki & Kopp, 1993), the main effect of gender, $F(8,77)=2.92$, $p<.01$ was significant. The interaction between age and gender were marginally significant, $F(8,77)=2.04$, $p<.06$ (Table 12). Gender contributed 23% to the variance of compliance ($1-\beta=.93$), while the variance explained by the interaction was $\eta^2=.17$, $1-\beta=.79$.

Table 12 shows the results from follow-up one-way ANOVAs. Five-year-olds were more compliant with delay rules, $F(1,84)=5.61$, $p<.05$, family routines, $F(1,84)=5.31$, $p<.05$, and self-care, $F(1,84)=18.96$, $p<.001$. Univariate gender effects demonstrated that girls were more compliant with rules related to self-care, $F(1,84)=10.71$, $p=.002$, and respect for others, $F(1,84)=7.11$, $p<.01$ (Table 12).
Table 12. Age and gender effects on mothers’ ratings of compliance

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Note. A = Age effect, G = Gender effect, AXG = Age X Gender interaction.

The 8X2X2 MANOVA (Compliance categories X Age X Gender) was also performed with the teachers’ data (Table 13).
Table 13. Age and gender effects on teachers’ ratings of compliance

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Note. A = Age effect, G = Gender effect, AXG = Age X Gender interaction.

A significant multivariate effect was found for age, $F(1,84)=4.54$, $p<.001$ and gender, $F(1,84)=3.34$, $p<.01$. The multivariate effect for the interaction between age and
gender was not significant, $F(1,84)=.25$, $p>.05$. Age contributed 32% to the variance of compliance ($\eta^2=.32$, $1-\beta=.99$) while for gender $\eta^2$ was .26 ($1-\beta=.96$).

Table 13 shows significant univariate age effects for all compliance categories except for respect for others, $F(1,84)=2.83$, $p>.05$. Teachers gave higher compliance scores to 5-year-olds in rules related to child safety $F(1,84)=13.17$, $p<.001$, ability to delay, $F(1,84)=10.75$, $p<.01$, food and mealtime routines, $F(1,84)=14.38$, $p<.001$, school routines, $F(1,84)=6.17$, $p<.01$, manners, $F(1,84)=6.09$, $p<.01$, protection of personal property, $F(1,84)=4.43$, $p<.05$, and self-care, $F(1,84)=15.67$, $p<.001$.

Univariate gender effects indicated that girls were more compliant than boys with rules regarding child’s safety, $F(1,84)=10.63$, $p<.01$, food and mealtime routines, $F(1,84)=4.35$, $p<.05$, school routines, $F(1,84)=8.78$, $p<.01$, protection of personal property, $F(1,84)=8.00$, $p<.01$, and respect for others, $F(1,84)=11.78$, $p<.001$ (Table 13). Boys and girls did not differ in compliance to rules about ability to delay, $F(1,84)=.036$, $p>.05$, manners, $F(1,84)=.003$, $p>.05$, and self-care, $F(1,84)=2.66$, $p>.05$ (Table 13).

Overall, the findings from mother and teacher compliance ratings support the hypothesis of an age-related increase in behavioral self-regulation by demonstrating an increase in compliance scores.

**Coping questionnaires**

The four coping strategies based on the mothers’ ratings were analyzed in a 4X2X2 MANOVA with age and gender as the independent variables (Table 14). In general, it was predicted that independent forms of coping such as instrumental coping should increase with age.
Table 14. Age and gender effects on mothers’ and teachers’ ratings of coping strategies

<table>
<thead>
<tr>
<th></th>
<th>3-years n = 43</th>
<th>5-years n = 45</th>
<th>Boys n = 42</th>
<th>Girls n = 46</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MOTHERS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggression</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>2.76</td>
<td>2.49</td>
<td>3.02</td>
<td>2.26</td>
<td>A</td>
</tr>
<tr>
<td>SD</td>
<td>1.28</td>
<td>1.07</td>
<td>1.18</td>
<td>1.07</td>
<td>G</td>
</tr>
<tr>
<td>Effects</td>
<td>.120</td>
<td>.001</td>
<td>.542</td>
<td></td>
<td>AXG</td>
</tr>
<tr>
<td>Instrumental coping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>4.40</td>
<td>4.30</td>
<td>4.28</td>
<td>4.41</td>
<td>A</td>
</tr>
<tr>
<td>SD</td>
<td>.82</td>
<td>.88</td>
<td>.85</td>
<td>.85</td>
<td>G</td>
</tr>
<tr>
<td>p</td>
<td></td>
<td></td>
<td>.652</td>
<td>.526</td>
<td>AXG</td>
</tr>
<tr>
<td>Venting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>4.63</td>
<td>4.07</td>
<td>4.35</td>
<td>4.33</td>
<td>A</td>
</tr>
<tr>
<td>SD</td>
<td>1.02</td>
<td>1.06</td>
<td>1.07</td>
<td>1.09</td>
<td>G</td>
</tr>
<tr>
<td>p</td>
<td>.014</td>
<td>.701</td>
<td>.883</td>
<td></td>
<td>AXG</td>
</tr>
<tr>
<td>Avoidance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>3.52</td>
<td>3.64</td>
<td>3.39</td>
<td>3.75</td>
<td>A</td>
</tr>
<tr>
<td>SD</td>
<td>1.08</td>
<td>1.10</td>
<td>1.12</td>
<td>1.04</td>
<td>G</td>
</tr>
<tr>
<td>p</td>
<td>.488</td>
<td>.108</td>
<td>.998</td>
<td></td>
<td>AXG</td>
</tr>
<tr>
<td><strong>TEACHERS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instrumental coping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>3.88</td>
<td>4.57</td>
<td>4.05</td>
<td>4.40</td>
<td>A</td>
</tr>
<tr>
<td>SD</td>
<td>1.16</td>
<td>1.04</td>
<td>1.06</td>
<td>1.21</td>
<td>G</td>
</tr>
<tr>
<td>p</td>
<td>.002</td>
<td>.060</td>
<td>.254</td>
<td></td>
<td>AXG</td>
</tr>
<tr>
<td>Venting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>3.22</td>
<td>2.70</td>
<td>2.95</td>
<td>2.93</td>
<td>A</td>
</tr>
<tr>
<td>SD</td>
<td>1.45</td>
<td>1.55</td>
<td>1.56</td>
<td>1.49</td>
<td>G</td>
</tr>
<tr>
<td>p</td>
<td>.106</td>
<td>.854</td>
<td>.487</td>
<td></td>
<td>AXG</td>
</tr>
<tr>
<td>Aggression</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>2.27</td>
<td>2.16</td>
<td>2.61</td>
<td>1.83</td>
<td>A</td>
</tr>
<tr>
<td>SD</td>
<td>1.41</td>
<td>1.33</td>
<td>1.52</td>
<td>1.09</td>
<td>G</td>
</tr>
<tr>
<td>p</td>
<td>.474</td>
<td>.005</td>
<td>.964</td>
<td></td>
<td>AXG</td>
</tr>
<tr>
<td>Avoidance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>3.58</td>
<td>3.83</td>
<td>3.63</td>
<td>3.78</td>
<td>A</td>
</tr>
<tr>
<td>SD</td>
<td>.123</td>
<td>.97</td>
<td>.91</td>
<td>.88</td>
<td>G</td>
</tr>
<tr>
<td>p</td>
<td>.158</td>
<td>.320</td>
<td>.336</td>
<td></td>
<td>AXG</td>
</tr>
</tbody>
</table>

Note. A = Age effect, G = Gender effect, AXG = Age X Gender interaction.

Results yielded a multivariate effect for gender, $F(4,81)=3.44, p<.01$ ($\eta^2=.14$, $1-\beta=.84$). Contrary to expectation, no age effect was detected, $F(4,81)=1.90, p>.05$. As
shown in Table 14, a significant univariate effect of gender was found for aggression, $F(1, 84)=14.17, p<.001$, showing that boys were more likely to use aggressive coping strategies than girls.

The 4X2X2 MANOVA was also performed with the teachers' data. Age and gender were both significant at the multivariate level, $F(4, 81)=2.94, p<.05$ ($\eta^2=.12$, 1-\beta=.77) and $F(1, 84)=2.43, p<.05$ ($\eta^2=.10$, 1-\beta=.67), respectively. At the univariate level, instrumental coping was higher in 5-year-olds, $F(1, 84)=10.35, p<.01$, while aggression was higher in boys, $F(1, 84)=3.63, p<.001$ (Table 14).

**Correlations between mothers' and teachers' ratings**

The intercorrelations between coping categories revealed similar patterns for the mother and teacher data. As can be seen in Table 15, aggression was negatively correlated with instrumental coping and positively correlated with venting. Avoidance and instrumental coping were also positively correlated.

| Table 15. Intercorrelations between coping strategies |
|-----------------|-----|-----|-----|
|                      | 1   | 2   | 3   |
| **MOTHERS RATINGS** |     |     |     |
| 1. Aggression       |     |     |     |
| 2. Instrumental coping | -.22* |       |     |
| 3. Venting          | .39*** | .01  |     |
| 4. Avoidance        | -.17 | .41*** | -.05 |
| **TEACHERS RATINGS** |     |     |     |
| 1. Aggression       |     |     |     |
| 2. Instrumental coping | -.28** |       |     |
| 3. Venting          | .22* | -.18 |     |
| 4. Avoidance        | -.25** | .26** | -.32** |

*Note. N = 88; * $p < .05$, ** $p < .01$, *** $p < .001$.  
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Table 16 shows the correlations between mother and teacher data which revealed agreement on rating venting, avoidance, and composite score of compliance. These correlations demonstrate the consistency of children's behavior from home to school.

Table 16. Correlations between the mothers’ and the teachers’ ratings of compliance and coping strategies

<table>
<thead>
<tr>
<th>MOTHERS RATINGS</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEACHERS RATINGS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Aggression</td>
<td></td>
<td>.11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Instrumental coping</td>
<td></td>
<td>.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Venting</td>
<td></td>
<td></td>
<td>.23*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Avoidance</td>
<td></td>
<td></td>
<td></td>
<td>.44***</td>
<td></td>
</tr>
<tr>
<td>5. Composite compliance score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.43***</td>
</tr>
</tbody>
</table>

Note. N = 88; * p < .05, ** p < .01, *** p < .001.

Correlations between ratings and performance on task

Finally, the correlations of mothers’ and teachers’ ratings with performance on the experimental task were examined to further investigate the consistency in children’s behavior. As shown in Table 17, a significant positive correlation was found between rated compliance by mothers and teachers and work on task. In contrast, significant negative correlations were found between rated compliance by mothers and teachers and look at toys and play with toys.

Table 17. Correlations between rated compliance and performance on task

<table>
<thead>
<tr>
<th>Mothers’ composite compliance score</th>
<th>Teachers’ composite compliance score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work on task</td>
<td>.40***</td>
</tr>
<tr>
<td>Material play</td>
<td>.20</td>
</tr>
<tr>
<td>Look at toys</td>
<td>-.22*</td>
</tr>
<tr>
<td>Do nothing</td>
<td>-.17</td>
</tr>
<tr>
<td>Play with toys</td>
<td>-.29**</td>
</tr>
</tbody>
</table>

Note. N = 88; * p < .05, ** p < .01, *** p < .001.
The correlations between mothers and teachers ratings of coping with the rated degree of comfort are presented in Table 18. Only venting as rated by mothers and teachers was correlated with degree of comfort.

Table 18. Correlations between rated degree of comfort and coping strategies

<table>
<thead>
<tr>
<th></th>
<th>Degree of comfort</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MOTHERS RATINGS</strong></td>
<td></td>
</tr>
<tr>
<td>Aggression</td>
<td>-.07</td>
</tr>
<tr>
<td>Instrumental coping</td>
<td>-.01</td>
</tr>
<tr>
<td>Venting</td>
<td>-.29**</td>
</tr>
<tr>
<td>Avoidance</td>
<td>.08</td>
</tr>
<tr>
<td><strong>TEACHERS RATINGS</strong></td>
<td></td>
</tr>
<tr>
<td>Aggression</td>
<td>.10</td>
</tr>
<tr>
<td>Instrumental coping</td>
<td>.09</td>
</tr>
<tr>
<td>Venting</td>
<td>-.23*</td>
</tr>
<tr>
<td>Avoidance</td>
<td>.14</td>
</tr>
</tbody>
</table>

Note. N = 88; *p < .05, **p < .01, ***p < .001.

Interview

Finally, the children’s responses to the interview questions were examined. The children’s rating of how much they liked working, how much they wanted to play with the toys, and how much difficult it was to wait were analyzed in a 3X2X2 (Questions X Age X Condition) MANOVA. The multivariate age effect was significant, \(F(3,82)=4.61, p<.01\) (\(r^2=.15, 1-\beta=.89\)). Condition did not have a significant multivariate effect, \(F(3,82)=.74, p>.05\). The interaction between age and condition was not significant, \(F(3,82)=.59, p>.05\). A univariate age effect was found for the third question indicating that the 5-year-olds reported less difficulty in waiting to play with the toys.

---

4 The number of children’s responses to what they did or thought to help them work was not large enough to pursue any analyses. In addition, most children answered truthfully then asked if they touched the toys. Therefore, no further analyses were performed with this interview question.
The two age groups did not differ in how much they liked working, $F(1,84)=.17$, $p>.05$, and in how much they wanted to play with the toys, $F(1,84)=.10$, $p>.05$. In addition, children did not differentiate their responses to how much they liked working, $F(1,84)=.80$, $p>.05$, how much wanted to play with the toys, $F(1,84)=1.62$, $p>.05$, and how difficult it was to wait, $F(1,84)=.30$, $p>.05$, according to the experimental condition.

Intercorrelations between the interview questions are presented in Table 19. These correlations provide some validity to the interview construct by revealing relationships that were largely expected. Children who reported that they liked the sorting task were less likely to report difficulty waiting to play with the toys, $r=-.37$, $p<.01$. Finally, children who reported they liked the toys also reported difficulty waiting to play with the toys, $r=.24$, $p<.05$.

Table 19. Intercorrelations between interview questions

<table>
<thead>
<tr>
<th>Question:</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Did you like working with spoons and forks?</td>
<td></td>
<td>-0.07</td>
</tr>
<tr>
<td>2. Did you like the toys?</td>
<td>-0.37***</td>
<td>0.24*</td>
</tr>
<tr>
<td>3. Was it hard waiting to play?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. $N=88$; *$p<.05$, **$p<.01$, ***$p<.001$.

ASSOCIATION BETWEEN BEHAVIORAL AND EMOTIONAL SELF-REGULATION

In order to examine the association between indices of behavioral and emotional self-regulation, a series of correlational analyses were performed. First the correlations between the task variables of emotional and behavioral self-regulation were examined. Degree of comfort was correlated with work on task, material play, look at toys, do
nothing, play with toys, and time until the first toy contact. Separate analyses were performed for the 3- and 5-year-old group.

As shown in Table 20, there was a significant negative correlation between degree of comfort and do nothing, and a significant positive correlation between degree of comfort and play with the toys for the 3-year-olds. The children who were rated as emotionally more comfortable during the task were less likely to do nothing, $r=-.33$, $p<.05$ and more likely to play with the toys, $r=.32$, $p<.05$.

More of the correlations between observational variables and rated degree of comfort were significant for the 5-year-olds. Table 20 shows that children who were rated as comfortable during the task were less likely to look at the toys, $r=-.57$, $p<.001$, less likely to do nothing, $r=-.58$, $p<.001$, and more likely to work on the task, $r=.54$, $p<.05$.

Table 20. Correlations between rated degree of comfort and other task variables

<table>
<thead>
<tr>
<th>Degree of comfort of:</th>
<th>Work play</th>
<th>Material play</th>
<th>Look at toys</th>
<th>Do nothing</th>
<th>Play with toys</th>
<th>Time until first contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-year-olds$^a$</td>
<td>.19</td>
<td>-.06</td>
<td>-.23</td>
<td>-.33$^*$</td>
<td>.32$^*$</td>
<td>-.09</td>
</tr>
<tr>
<td>5-year-olds$^b$</td>
<td>.54$^{***}$</td>
<td>-.04</td>
<td>-.57$^{***}$</td>
<td>-.58$^{***}$</td>
<td>.01</td>
<td>.09</td>
</tr>
</tbody>
</table>

Note. $^an=43; b n=45; ^*p<.05, ^{**}p<.01, ^{***}p<.001$.

The correlations found in the 5-year-old group were higher than those found in the 3-year-old-group. In order to test whether the difference in the correlations was significant, the z-test for testing independent $r$s, using Fisher z-transformations, was performed (Glass & Hopkins, 1996). The test revealed that the correlation between degree of comfort and look at the toys was significantly stronger in the 5-year-old group,
$z=1.881$, $p<.05$ (one-tailed). Similarly, the correlation between degree of comfort and work on task was significantly greater in the 5-year-old group, $z=1.877$, $p<.05$ (one-tailed).

Second, the association between emotional and behavioral self-regulation was examined in the correlations between the composite score of compliance and coping strategies. Both the mother and teacher data were examined. As reported in Table 21, for the 5-year-old group, the mothers' composite score of compliance was positively correlated with instrumental coping, $r=.40$, $p<.01$, and avoidance, $r=.35$, $p<.05$, and negatively correlated with aggression, $r=-.43$, $p<.01$. The mothers' score did not correlate with any one of the coping strategies in the 3-year-old group.

<table>
<thead>
<tr>
<th>Compliance:</th>
<th>Instrumental</th>
<th>Aggression</th>
<th>Avoidance</th>
<th>Venting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3-year-olds</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mothers' composite</td>
<td>.08</td>
<td>-.14</td>
<td>.13</td>
<td>-.02</td>
</tr>
<tr>
<td>Teachers' composite</td>
<td>.37&lt;sup&gt;**&lt;/sup&gt;</td>
<td>-.50&lt;sup&gt;***&lt;/sup&gt;</td>
<td>.56&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-.25</td>
</tr>
<tr>
<td><strong>5-year-olds</strong>&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mothers' composite</td>
<td>.40&lt;sup&gt;**&lt;/sup&gt;</td>
<td>-.43&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.35&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.00</td>
</tr>
<tr>
<td>Teachers' composite</td>
<td>.12</td>
<td>-.72&lt;sup&gt;***&lt;/sup&gt;</td>
<td>.11</td>
<td>-.13</td>
</tr>
</tbody>
</table>

Note. <sup>a</sup>n = 43; <sup>b</sup>n = 45; $p < .05$, $** p < .01$, $*** p < .001$.

Table 21 also shows that the teachers' composite score of compliance was positively correlated with instrumental coping, $r=.37$, $p<.01$ and avoidance, $r=.56$, $p<.001$ in the 3-year-olds, while there was a negative correlation with aggression, $r=-.50$, $p<.001$. For the 5-year-old group, the teachers' composite score of compliance was correlated with only one coping strategy, aggression $r=-.72$, $p<.001$. Only the correlation

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between teachers’ composite score of compliance and aggression was significantly
greater for the 5-year-old group, $z=2.37$, $p<.01$.

Furthermore, the relationship between work on task and coping strategies was
explored (Table 22). Significant results were found for the 5-year-olds only. A
significant positive correlation was found between work and instrumental coping as
rated by the mothers, $r=.34$, $p<.05$. Aggression and venting as rated by the mothers were
negatively correlated with work, $r=-.39$, $p<.05$, $r=-.29$, $p<.05$, respectively). Finally,
aggression as rated by the teachers was negatively correlated with work on task, $r=-.30$,
$p<.05$.

Table 22. Correlations between coping strategies and work on task

<table>
<thead>
<tr>
<th></th>
<th>Mothers’ data</th>
<th>Teachers’ data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3-year-olds$^a$</td>
<td>5-year olds$^b$</td>
</tr>
<tr>
<td>Instrumental</td>
<td>.11</td>
<td>.34***</td>
</tr>
<tr>
<td>Aggression</td>
<td>.17</td>
<td>-.39**</td>
</tr>
<tr>
<td>Avoidance</td>
<td>.08</td>
<td>.17</td>
</tr>
<tr>
<td>Venting</td>
<td>.17</td>
<td>-.29*</td>
</tr>
</tbody>
</table>

Note. $^a n = 43; ^b n = 45; * p < .05, ** p < .01, *** p < .001.$

**SUMMARY OF RESULTS**

This section provides a summary of the analyses involved in data reduction,
preliminary analyses, methodological considerations, and the main findings as they
pertain to the hypotheses of the study.

**Data reduction**

Data reduction was achieved to eliminate redundancy and increase the statistical
power of the analyses. The task variables were reduced to 7 categories: a rated degree of
comfort, and six observational categories including work on task, material play, look at
toys, do nothing, play with toys, and time until the first toy contact. Factor analysis revealed four main coping strategies: Aggression, Instrumental Coping, Venting, Avoidance. All of the eight compliance categories were used in the analyses.

**Preliminary analyses**

A series of preliminary analyses were performed to identify gender, order, and toyset effects on the task variables. Because gender appeared to have no direct effect on the task variables and minimal interactive effects with age and condition, it was eliminated from further analyses. On the other hand, the interaction between order and condition was significant for work on task, do nothing, and time until the first toy contact. A toyset effect was observed for degree of comfort, work on task, and do nothing. To account for these effects, order was considered as a between-factor in further analyses along with age, and toyset was used as a covariate.

**Methodological considerations**

The internal consistency of the questionnaires, the reliability of the coding system, and the inter-observer agreement were shown to be satisfactory. In addition, the effectiveness of the experimental conditions was supported by the main effect of condition on several task variables. All children were rated as more comfortable, worked more, and were more likely to do nothing in the low-demand condition. On the other hand, all children looked more at the toys in the high demand condition.
Development of behavioral self-regulation

The study predicted an age-related increase in behavioral self-regulation as indexed by the different levels of compliance during the experimental task and the compliance scores obtained from mothers and teachers.

Age differences in the expected direction were found on all of the task variables. Five-year-olds worked more and were involved in more material play. In contrast, the 3-year-olds exceeded the 5-year-olds by looking more at the toys and playing more with the toys. Three-year-olds were also more likely to do nothing during the task than the 5-year-olds. Finally, 3-year-olds were more likely to touch the toys for the first time sooner than the 5-year-olds.

Age differences in compliance were also supported by mother and teacher ratings. Five-year-olds were more compliant with delay rules, family routines, and self-care practices. Teachers gave higher compliance scores to 5-year-olds in rules related to child safety, ability to delay, food and mealtime routines, school routines, manners, protection of personal property, and self-care.

High correlations were found between the various measures of compliance (i.e., ratings and performance on task). Gender differences were also identified. Mothers rated girls as more compliant with rules related to self-care and respect for others. Teachers rated girls as more compliant than boys with rules regarding child’s safety, food and mealtime routines, school routines, protection of personal property, and respect for others.
Development of emotional self-regulation

The study also predicted an age-related increase in emotional self-regulation. An age difference in the expected direction was found for rated degree of comfort during the experimental task. Five-year-olds were rated as more comfortable than were the 3-year-olds.

When the children were interviewed after the task about their emotional state, 5-year-olds reported less difficulty in waiting to play with the toys, thus, supporting the hypothesis. The two age groups did not differ in how much they liked working and in how much they wanted to play with the toys. Children who reported that they liked the sorting task were less likely to report difficulty waiting to play with the toys. Children who reported that they liked the toys also reported difficulty waiting to play with the toys.

Age and gender differences in coping strategies were reported by mothers and teachers. Based on the mothers' ratings, 5-year-olds were less likely to use venting than the 3-year-olds. Teachers reported age differences in coping strategies by rating instrumental coping higher in 5-year-olds. Mothers and teachers rated boys as more likely to use aggressive coping strategies than girls.

Association between behavioral and emotional self-regulation

A relationship between behavioral and emotional self-regulation was predicted. It was also expected that the relationship would become stronger with age. The first prediction was supported by the interaction between age and condition during the experimental task. This interaction was significant for work on task, look at toys, and do nothing.
The age difference in work on task was greater in the low demand condition due to the condition effect on the 5-year-olds. Five-year-olds worked less in the high than the low condition. The age difference in look at toys was greater in the high demand condition. Three- and 5-year-olds looked more at the toys in the high than the low condition and the 3-year-olds were affected more. The age difference found for do nothing was greater in the low demand condition due to the fact that the 3-year-olds remained more idle in the low condition. The behavior of 5-year-olds was not affected by the condition.

A number of correlations between indices of behavioral and emotional self-regulation also supported the association between emotional and behavioral self-regulation. Three-year-olds who were rated as being emotionally comfortable during the task were less likely to do nothing. Five-year-olds who were rated as comfortable during the task were less likely to look at toys, less likely to do nothing, and more likely to work on the task. The correlation between degree of comfort and look at the toys was significantly stronger in the 5-year-old group. Similarly, the correlation between degree of comfort and work on task was significantly greater in the 5-year-old group. The latter two findings support the prediction that the relationship between emotional and behavioral self-regulation becomes stronger with age.

For the 5-year-olds, a significant positive correlation was found between work on task and instrumental coping as rated by the mothers. Aggression and venting as rated by the mothers were negatively correlated with work on task. Finally, aggression as rated by the teachers was negatively correlated with work on task.
For the 5-year-old group, the mothers’ composite score of compliance was positively correlated with instrumental coping and avoidance, and negatively correlated with aggression. The mothers’ score did not correlate with any one of the coping strategies in the 3-year-old group. The teachers’ composite score of compliance was positively correlated with instrumental coping and avoidance, in the 3-year-olds, while there was a negative correlation with aggression. For the 5-year-old group, the teachers’ composite score of compliance was only correlated with aggression. The correlation between teachers’ composite score of compliance and aggression was significantly greater for the 5-year-old group, thus, supporting the age-related increase in the association between emotional and behavioral self-regulation.
CHAPTER 7: DISCUSSION

DEVELOPMENT OF BEHAVIORAL SELF-REGULATION

The first hypothesis of the study speculated an age-related increase in behavioral self-regulation from 3 to 5 years of age. The results of the present study provide ample evidence in support of this hypothesis. Five-year-olds scored higher at all levels of compliance during the experimental task than did 3-year-olds. Consistent with the experimental results, 5-year-olds were rated as more compliant than the 3-year-olds by mothers and teachers. These findings are discussed in greater detail in the sections that follow.

Age-related increase in self-regulated compliance

Compared to 3-year-olds, 5-year-olds were better able to comply with the two rules of the experimental situation: to sort the cutlery and not play with the toys. They spent more time working on the task than did the 3-year-olds, thus, maintaining their focus on sorting and away from the toys. At the lower level of compliance, material play, which required them to resist the toys but not necessarily to work on task, 5-year-olds again outperformed the 3-year-olds. They were engaged in material play 3 times longer than the 3-year-olds (Table 11). The 5-year-olds maintained the focus on the task even when they were not sorting. Playing with the spoons and forks may serve to turn the task to an interesting and perhaps entertaining activity.

Three-year-olds physically avoided the toys, but maintained a focus on them. They spent as much as 3 times more time looking at the toys. Three-year-olds were also 3 times more likely to do nothing during the experimental session (Table 11). The
behaviors of the two age groups suggest that, in response to the monotony of the sorting task, the 3-year-olds looked at the toys and did nothing, while the 5-year-olds played with the spoons and forks. It is very possible that material play functioned as a coping strategy for the 5-year-olds. The 3-year-olds, in contrast, seemed less efficient in implementing this strategy, partially because they may not be as good in motivating themselves. As noted in the literature review, several theorists consider internal motivation a significant factor in the internalization of standards of behavior (Hoffman, 1988; Lepper, 1983; Power & Manire, 1992).

The cognitive literature also supports the notion that young children use strategies that are not very sophisticated or not always effective (Bjorklund, 1990). Due to the increasing ability to encode representational events, 5-year-olds have broader experience and knowledge that allow them to invent new ways to use the spoons and forks (e.g., fit the forks together to make a pyramid) (Siegler, 1991). In a similar line of reasoning, using a Piagetian explanation (Flavell, 1968), it is possible that 5-year-olds are able to devise elaborate schemes expressed in material play based on sorting. Three-year-olds are more rigid on their respective definitions of play with task materials and work. They fail to integrate the two in a new activity that is entertaining and helpful in dealing with the experimental situation. Finally, focusing on the spoons and forks, allowed the 5-year-olds to spend more time sorting. Compared to the 3-year-olds, 5-year-olds spent twice as much time working on the sorting task (Table 11).

At the lower level of compliance (i.e., violation of both rules) clear-cut age-differences emerged. The 3-year-olds were more likely to violate the task rules sooner
and give in to their desire to play with the toys. They also spent 4 times more time playing with the toys. It seems that 3-year-olds had greater sensitivity to the features of the toys. The 5-year-olds exercised greater analytic power (Bjorklund, 1989), allowing them to consider a larger array of options other than playing with the toys. This finding supports previous studies that generally report an increase in performance on waiting tasks from age 2 and onward (Golden et al., 1977; Mischel, 1974; Toner et al., 1980). Furthermore, the literature indicates that young children have trouble resisting temptation because they have not developed effective delay strategies yet (Yates & Mischel, 1979). The findings of the present study expand the existing evidence by demonstrating that the 3-year-olds show difficulty delaying even when an alternative to waiting is given. As discussed earlier, the 3-year-olds failed to engage in material play which could have maintained their focus on the task.

The increase in compliance during the observational task supports Kopp’s (1982) developmental model of self-regulation which predicts a progression from other-to self-regulation. The findings of this study are noteworthy, because unlike previous studies, there were no external monitors in the experimental situation to facilitate compliance. As indicated in the literature review, laboratory and observational studies that have examined compliance to the mother do not always show an age-related increase. Rather, these studies indicated that compliance must be considered in terms of situational demands. When, however, the distinction is made between compliance that is internally motivated versus compliance that is externally monitored, the findings appear clearer (Kochanska et al., 1995).
This distinction between external and internal control of compliance was proposed by Kochanska et al. (1995) who demonstrated an age-related increase in self-regulated compliance from 33 to 46 months. The present study extends Kochanska's findings in two ways. First, the present findings replicate the effect on a more restrictive task. In Kochanska's study, the children had to perform a dull sorting task in the presence of prohibited toys but they knew that their mother was nearby. The children were also familiar with the room because they had experienced free play time with their mother prior to the compliance session. Second, the experimental procedures were different than those of Kochanska. In Kochanska's study the experimenter entered the room after 3 min and played with the toys for a while, whereas in the present study the experimenter did not have any contact with the children during the 10-minute session. It is possible that the brief presence of the experimenter provided some comfort and emotional support or created an anticipation for another appearance of the experimenter. In addition, Kochanska did not use the same task at both testing times.

The age-related increase in compliance was also supported by mother and teacher ratings on a 4-point scale. This finding differs from that of Gralinski and Kopp (1993) who used similar ratings but failed to show an age-related increase in compliance from 30 to 48 months. In the present study, five-year-olds were more compliant with delay rules, family routines, and self-care practices (Table 12). This study also provided data from teacher ratings while Gralinski and Kopp used only mothers. Teachers gave higher compliance scores to 5-year-olds in rules related to child safety, ability to delay, food and mealtime routines, school routines, manners, protection of personal property,
and self-care (Table 13). There are, however, similarities between the two studies in the magnitude of the ratings. In both cases, mothers gave scores lower than 3 for delay and family routines rules (one SD from the other categories), establishing that children need maternal intervention to comply with such rules.

Overall, the results of the mothers’ and teachers’ ratings of compliance support Kopp’s developmental model. Older children needed fewer reminders from mothers and teachers to comply with a variety of rules. By the age of 5, children have internalized standards of behaviors, permitting them to function independently in a variety of settings. In addition, the strong correlation between the teachers’ and mothers’ ratings of compliance suggests that children show consistency in their ability to control behavior across different contexts (Table, 16). This aspect of the data implies that children who behave well at home are expected to be more compliant at school compared to other children who are less compliant at home. Furthermore, the results showed that children who were rated as more compliant by mothers and teachers worked more and played less with the toys during the experimental task (Table, 17). Thus, although compliance is situation-specific (i.e., some rules are internalized sooner than others), once children achieve a level of self-regulated compliance, they are likely to generalize behavior to other contexts. As Kopp (1991) explained, children are more likely to generalize the rules they learned after they understand the similarities across contexts.

Mothers’ and teachers’ ratings of compliance were negatively correlated with look at toys but not with do nothing although both categories reflect second level of compliance. Do nothing may not be as well defined as look at toys because children...
might have been engaged in mental activities not observable to the experimenter. Alternatively, mothers and teachers may not perceive do nothing as a "compliance behavior" but as ignoring a request which is aversive to them (Patterson, 1982).

**Gender differences in self-regulated compliance**

Gender differences were also identified here, unlike Gralinski's and Kopp's (1993) previous findings. Girls, overall, were rated as more compliant than boys. Mothers rated girls as more compliant with rules related to self-care and respect for others. Teachers rated girls as more compliant with rules regarding safety, food and mealtime routines, school routines, protection of personal property, and respect for others. Gralinski and Kopp did not find gender differences, perhaps due to the smaller age range (30-48 months) relative to the one of the present study. The gender differences may be due to gender-differentiated socialization. Girls receive more pressure than boys to be nurturant, obedient, and responsible (Maccoby, 1980). Consequently, it is possible that noncompliance in boys may be less noticeable to mothers and teachers.

Interestingly, teachers reported age and gender differences in more compliance categories than mothers did. Mothers appear to be situation specific in their ratings whereas teachers tend to generalize behavior and not to elaborate on areas of differentiation. Alternatively, teachers may be more aware of gender differences because they observe the behavior of more children. Consequently, teachers' ratings may be more accurate. It is possible, however, that teachers are more stereotyped than mothers and therefore, their ratings were influenced accordingly. Another issue is why gender
differences were not found during the experimental task, but were substantial in mothers’ and teachers’ ratings. The experimental situation is relatively impersonal compared to the situations mothers and teachers observe the children. Girls might be more motivated than boys to comply in social situations.

Conclusions

The present study demonstrates a clear age-related increase in self-regulated compliance. The findings from the sorting task are particularly important because they highlight the value of examining the development of compliance in a setting that provides minimal external support. When children are left to rely on themselves, they are forced to use internal sources for compliance (e.g., cognitive abilities, motivation). This type of task can clearly illustrate age-related differences in the internalization of standards of behavior, a hallmark in behavioral self-regulation (Power & Manire, 1992).

Moreover, the age-related increase in compliance was also supported by mothers’ and teachers’ ratings, thus, pointing to the value of corroborating findings from different sources. Gender differences were also identified. Consistent with the existing literature, girls were rated by mothers and teachers as more compliant than boys.

DEVELOPMENT OF EMOTIONAL SELF-REGULATION

Age-related differences in emotional control and coping strategies

The study predicted an age-related increase in emotional self-regulation. An age difference in the expected direction was found for rated degree of comfort during the experimental task. Five-year-olds were rated as more comfortable than the 3-year olds.
The fact that the emotional state of older children is better regulated implies that during the preschool years, children progressively learn to maintain their composure under emotionally-demanding situations.

The age difference found on the subjective rating of emotional comfort is consistent with the children's responses to the interview after the task. Five-year-olds reported less difficulty in waiting to play with the toys although the two age groups did not differ in how much they wanted to play with the toys, and in how much they liked working with the spoons and forks. This congruence in findings supports the validity of the subjective rating. In addition, the children's responses to the interview were in the expected direction, thus demonstrating that the interview was an effective strategy to elicit self-reports about children's emotional state in this task. For example, children who said they liked the sorting task were less likely to report difficulty waiting to play with the toys, and children who said they liked the toys reported greater difficulty waiting to play with the toys (Table 19).

The age difference found in emotional comfort during the task, favoring the 5-year-olds, expands the existing literature on the expression of negative emotions in laboratory situations. Cole et al. (1992) demonstrated that even 2-year-olds express relatively well-modulated negative emotions in situations where mishaps accidentally happen (e.g., juice spilling). Interestingly, however, Cole (1986) did not find age differences in controlling the display of negative emotions from preschool to grade school (ages: 4.4 - 6.8 years). There are several ways to account for this contradiction. It is possible that age differences take place during the preschool period and then tend to
level off. Alternatively, it is also possible that different methodologies and measurements were responsible for yielding different results.

The development of emotional self-regulation was also examined by investigating the coping strategies of the children based on mothers’ and teachers’ ratings. A range of coping responses was examined. Four major coping categories were revealed from mothers’ and teachers’ data: aggression, instrumental coping, venting, and avoidance (Tables 2, 3). Venting is an emotion-focused coping strategy whereas instrumental coping is problem-oriented and more independent type of coping.

Mothers reported venting as the most frequent coping strategy of the 3-year-olds. For the 5-year-olds, instrumental coping was rated as the most frequent coping strategy. Five-year-olds and older children gradually develop the ability to organize, plan, and monitor actions (Zelazo & Reznick, 1991), qualities that are involved in instrumental coping. Teachers, on the other hand, reported instrumental coping as the most frequent strategy for both age groups. Further, both mothers and teachers rated aggression as the least likely coping strategy for both age groups (Table 14).

Mothers and teachers reported that children who used aggression as a coping strategy were also likely to vent their emotions. Avoidance, on the other hand was positively correlated with instrumental coping in both mother and teacher data sets. It seems that avoidance and distraction are relatively adaptive coping strategies. Future research may examine further this assumption as well as the contexts in which children are more likely to resort to avoidant coping strategies.
Mothers reported an age-related decrease in venting which includes behaviors such as crying to release pent-up feelings or to make someone intervene. This finding was significant at the univariate level although the multivariate effect of age was not significant. Teachers, on the other hand, reported an age-related increase in instrumental coping which includes behaviors such as taking action to solve the problem either on their own or by asking for help from others. The existing evidence, although limited, generally supports these findings. For example, Halpern (1997) found a positive correlation between age and problem-focused coping and a negative correlation between age and emotion-focused coping in a group of preschoolers (age range: 37-73 months). Moreover, Fleury (1995) observed an increase in problem-solving from 2 to 4 years in the setting of day care. It is important to note that these studies corroborate the same findings although they use different methodologies. Finally, in this study avoidant and distracted modes of coping did not significantly decrease with age in contrast to Fleury's findings.

The age-related differences in coping strategies demonstrate that during the preschool period, children slowly make strides towards coping modes that are less emotion-focused and more problem-solving oriented. Children seem to slowly adopt more independent strategies of coping. These findings are consistent with Kopp's (1989) model of emotional self-regulation development.

The present results are also consistent with Hobfoll et al.'s (1994) dual-axis model of coping which seems to capture the age-differences found here. According to this model, coping varies according to two continuums; active versus passive, and
prosocial versus antisocial. Healthy coping is problem-solving oriented and prosocial (e.g., asking for help in a nonaggressive manner). Preschoolers seem to progress towards psychologically more adaptive coping strategies. Interestingly, this pattern of findings is observed during the school-age period as well. For example, Bernzweig, Eisenberg, and Fabes (1993) reported that mothers rated cognitive restructuring and direct problem solving as more frequent strategies among second graders than among kindergartners.

Another issue is the fact that mothers and teachers reported different age-related changes in children's coping strategies. Mothers seem to attend more to emotion-focused strategies whereas teachers attend more to problem-focused strategies. Differences in expectations on the part of mothers and teachers, and differences in children's behavior in the school and home settings are likely sources of the rating differences. Moreover, the greater structure and predictability of the school environment may facilitate the use of instrumental coping. At home, children may experience greater emotional arousal than in school. They are usually left alone to entertain themselves while parents perform various tasks. Consequently, it may be more difficult to apply instrumental coping at home. Indeed, there is evidence that preschoolers use less instrumental or problem-focused strategies with their parents as opposed to peers in school (Halpern, 1997). There were significant correlations between mothers' and teachers' ratings for venting and avoidance only, which indicates limited cross-situation consistency in coping strategies during the preschool years.
Gender differences in coping strategies

Finally, another interesting finding was the rated gender differences. Both mothers and teachers reported that boys are more likely to use aggression as a way to cope with frustration. This is generally supported in the literature which shows that boys tend to be more physically aggressive than girls (Maccoby & Jacklin, 1980). The same pattern of gender differences seems to continue during the school age period. Based on self-reports, Lopez and Little (1996) found that 2nd- and 6th-grade boys used more aggressive coping than girls.

In general, gender differences are rarely found during infancy regardless of whether studies are based on mothers’ reports (Hildebrandt-Karraker et al., 1994), naturalistic observations (Hyson, 1983), or observations in the laboratory (Mangelsdorf et al., 1995; Rothbart et al., 1992). During the preschool period, findings are not consistent in part due to different methodologies. Zahn-Waxler et al. (1994) who examined children’s responses to hypothetical situations similar to those included in the coping questionnaires did not find gender differences in aggression in 4- and 5-year-old high risk children. Based on mothers’ reports, Bernzweig, Eisenberg, and Fabes (1993) found that boys used more cognitive restructuring and girls more emotion-focused support. Fabes and Eisenberg (1992) who observed coping in the school setting, found that boys were more likely to vent when dealing with interpersonal anger while girls were more likely to resist the peer who provoked them (M = 55.43 months).

During the school age period, Wertlieb et al. (1987) found that boys reported to use more self-focused strategies (e.g., stay in the room) whereas girls reported to use
more environment-focused strategies (e.g., go tell mom). Similarly, Rossman (1992) found that girls reported to involve parents to get help or ask for emotional support from a peer, and behave in ways that communicate their distress. This is in agreement with the trend reported by the teachers of this study, according to which, preschool girls are more likely to use instrumental coping than preschool boys. That is, girls are more likely to ask for an adult to intervene and solve the problem for them or provide emotional comfort.

Taken together, the literature reports that gender difference in coping begin to appear after the second year of life. During the preschool period, boys are more likely to express their anger and frustration more directly and in an aggressive manner (Doyle & Biaggio, 1981) and girls tend to utilize non-aggressive strategies to resolve frustration (Miller, Danaher, & Forbes, 1986). One possible explanation for these gender differences may be that girls are encouraged to maintain proximity with adults and seek help more than boys (Fagot, 1978). Another explanation is that girls achieve emotional maturation faster than boys. By the age of 2, girls have more words about feelings and they can discern emotions in others better than boys (Dunn et al., 1987). Gender differences can be explained by the fact that boys and girls may have different goals regarding their coping responses to frustration. Boys may be more likely to use coping strategies that are designed to meet their own needs, whereas girls’ strategies may be selected to maximize interpersonal harmony. These conclusions are consistent with gender stereotypes that girls are socialized to be more nurturant and relationship-oriented than are boys (Block, 1973; Maccoby & Jacklin, 1974). Because children’s
coping strategies vary with different goals (Krasnor & Rubin, 1983), one important direction for future research is to examine how children’s frustration-related coping strategies vary with their goals and what factors elicit different goals in boys and girls.

Conclusions

Overall, the present study demonstrates an age-related increase in the ability to maintain a positive state during the emotionally-demanding experimental task. The study also provides evidence that preschool children make small advancements towards achieving more independent, problem-focused coping strategies. Interestingly, mothers and teachers tend to report different ratings in coping strategies which points to limited cross-situation consistency of coping strategies during the preschool period. Finally, gender differences in coping strategies demonstrate that boys are more likely to cope with their frustration in an aggressive manner whereas girls are more likely to ask for emotional support, seek help, or take their own actions to solve the problem. The literature on age-related changes on coping strategies, however, is still limited and future research needs to address this gap.

ASSOCIATION BETWEEN BEHAVIORAL AND EMOTIONAL SELF-REGULATION

Based on Kopp’s developmental model, it was hypothesized that the development of emotional self-regulation is a major factor in the development of behavioral self-regulation. It was, therefore, expected that a strong association would be observed between behavioral and emotional self-regulation that actually becomes stronger with age. Evidence for this association is particularly important because of the
lack of existing findings to support such theoretical speculation. The relationships found between compliance, emotional comfort, and coping are discussed first.

**Relationship between coping, emotional comfort, and self-regulated compliance**

The present study provided evidence that behavioral self-regulation during the boring sorting task is associated with emotional self-regulatory indices such as coping strategies (Table 22). A significant positive correlation between work on task and instrumental coping as rated by the mother was found for the 5-year-olds. This implies that achieving higher levels of compliance interacts with the acquisition of independent and problem-focused coping skills. In contrast, aggression and venting as rated by the mothers, and aggression as rated by the teachers were negatively correlated with work on task for the 5-year-olds. Aggression might inhibit the development of behavioral self-regulation. The relationship is confirmed by Patterson's (1982) finding that aggressive children have high levels of noncompliance and possible difficulty in internalizing standards of behavior.

The fact that the correlations between work on task, aggression, and instrumental coping were not significant for the 3-year-old group is intriguing. It is possible that some coping strategies, particularly instrumental coping, are not yet developed or cannot be applied efficiently. It is also possible that the level of work on task of the 3-year-olds was too low to be associated with coping abilities.

Additional evidence for the association between behavioral and emotional self-regulation comes from the correlations between the rated score of compliance and the rated coping strategies (Table 21). For the 5-year-old group, the mother's composite...
score of compliance was positively correlated with instrumental coping and avoidance, and negatively correlated with aggression. The mother's score did not correlate with any of the coping strategies in the 3-year-old group. These findings replicate the findings of the correlations between work on task and coping strategies.

Similar to the mothers' data, the teacher's composite score of compliance was negatively correlated with aggression for the 5-year-olds. Additionally, significant correlations were revealed for the 3-year-olds. The composite score of compliance was positively correlated with instrumental coping and avoidance while there was a negative correlation with aggression. The fact that mothers did not report any correlations between coping and compliance for the 3-year-olds but teachers did, is of methodological interest. It is possible that children are forced to function more independently in school than home. Therefore, teachers have the opportunity to observe more incidents where instrumental coping is applied by both age groups. As discussed earlier, teachers also reported age differences in instrumental coping whereas mothers did not. Finally, the correlation between avoidance and compliance may be due to teachers valuing avoidance more than mothers. Teachers may have associated avoidance with being compliant and staying out of trouble.

Moreover, the negative correlation between teacher's composite score of compliance and aggression was significantly greater for the 5-year-old group, thus supporting the age-related increase in the association between behavioral and emotional self-regulation. The less aggressive the children become with age, the easier it will be to regulate behavior according to internalized rules.
A number of significant correlations between emotional comfort during the task and indices of compliance provides additional support for the association between behavioral and emotional self-regulation (Table 20). Three-year-olds who were rated as being emotionally comfortable during the task were less likely to do nothing and more likely to play with the toys. In contrast, 5-year-olds who were rated as comfortable during the task were more likely to work on task and less likely to look at the toys and do nothing. The fact that degree of comfort was associated with play behavior in the 3-year-olds and with work behavior in the 5-year-olds points to the task-oriented behavior of the older children. Five-year-olds might have felt more competent in performing the task and, therefore, sorting was more pleasant to them than to the 3-year-olds. As discussed earlier, 3-year-olds had greater difficulty with the delay component of the task and maintained a longer focus on the toys. Playing with toys might have brought a sense of relief from waiting which was reflected in the degree of comfort.

The correlation between degree of comfort and look at the toys was significantly stronger in the 5-year-old group. Similarly, the correlation between degree of comfort and work on task was significantly greater in the 5-year-old group. These findings support the prediction that the relationship between behavioral and emotional self-regulation becomes stronger with age. Five-year-olds maintained a positive emotional state during the task that allowed them to comply with the task rules more than the 3-year-olds. The findings showing the age-related increase in the association between behavioral and emotional self-regulation significantly expand Kopp’s model of self-
regulation. Although Kopp did not predict that the association becomes stronger with age, it is a reasonable hypothesis tested for the first time in the present study.

Relationship between emotional demands and compliance during the task

Examining the relationship between the demands for emotional self-regulation and self-regulated compliance during the task provides additional evidence for the association between behavioral and emotional self-regulation. The significant interactions between age and experimental condition for work on task, look at toys, and do nothing illustrate the relationship.

The interactions revealed a complex pattern of findings. It was initially predicted that the 3-year-olds would be affected more by the demands of the high condition, whereas the performance of the 5-year-olds would be relatively unaffected. The prediction was based on the assumption that 5-year-olds have better emotional self-regulatory ability than the 3-year-olds. Consequently, varying the demands for emotional regulation in this particular task would not differentially affect their performance on the task.

This, however, was not always the case. The findings showed that the 5-year-olds worked more in the low than the high demand condition but the 3-year-olds did not (Figure 2). Work on task is the highest level of compliance because it requires sorting and avoiding the toys. It is possible that the demands for compliance and emotional regulation were too high for the older children during the high condition. As a result, work on task declined. The 3-year-olds, on the other hand, showed unchanging patterns of compliance at that level as if there were a limit to their performance on work on task.
Their performance may reflect demands for work on task in the low condition that were beyond the children's resources to begin with. Therefore, in the high condition where the demands were even greater, the performance of children did not change (i.e., work on task was not affected by the demands for emotional self-regulation).

However, when the performance for look at toys and do nothing are considered, the findings support better the initial predictions (Figures 3, 4). Both behaviors reflect lower level compliance because the children are only required to stay away from the toys. Both 3- and 5-year-olds looked at the toys more in the high condition. However, the 3-year-olds looked more than did the 5-year-olds. This finding supports the hypothesis that the 3-year-olds would be more affected by the high demand condition. Finally, the age difference found for do nothing was greater in the low demand condition. The 3-year-olds remained more idle in the low condition, again demonstrating the predicted effect. In the high condition, the 3-year-olds apparently preferred to look at the toys instead of doing nothing (Table 11).

Overall, these findings imply that the nature of the relationship between behavioral and emotional self-regulation may be more complicated than was previously assumed. The significant correlations between coping, emotional comfort, and compliance demonstrate the existence of such association which becomes stronger with age. The increasing ability for emotional self-regulation in older children is related to better behavioral self-regulation and vice versa. The results from the task variables, however, indicate that this may not be always the case. Other factors must be considered in order to predict the performance of children in a given situation. The child's
resources for emotional and behavioral self-regulation must be considered in relation to
the particular demands of a given task. A new theoretical explanation that includes these
factors in an interactive and dynamic way is needed. The following model is an attempt
to explain the association between behavioral and emotional self-regulation.

Proposed model of integrating behavioral and emotional self-regulation

The model is based on the assumption that children have age-specific limits to
their ability for behavioral and emotional self-regulation (Figure 5). The limit for
behavioral self-regulation refers to the extent to which children can use rules to guide
their behavior. The limit for emotional self-regulation refers to the extent to which
children can regulate emotions. When the demands for behavioral self-regulation exceed
the limit of their resources, children become less effective in applying previously
learned standards as behavioral guidelines (e.g., children are uncooperative and less
compliant). When children are involved in a situation where the demands for emotional
self-regulation exceed their limit of resources, they lose emotional control (e.g.,
uncontrolled frustration makes children cry).

The limit of behavioral self-regulation is determined by the age of the child,
temperament, motivation, social experience, and cognitive abilities. The limit of
emotional self-regulation is determined by the above mentioned factors, as well as
subjective experience of emotions and ability to cope with arousal. Finally, the limits
are specific to a task or situation. The model also assumes that limits are extended with
increasing age indicating greater resources for behavioral and emotional self-regulation.
The notion of applying limits to the ability for behavioral and emotional self-regulation may assist in understanding the task findings of this study, and the relationship between behavioral and emotional self-regulation. Figure 5 represents the demands for emotional self-regulation in relation to the limits of emotional self-regulation for both age groups.

Five-year-olds have greater resources for emotional self-regulation. Therefore, the limit line of the 5-year-olds is higher that the limit line of the 3-year-olds. The demands are ranked based on degree of difficulty to cope with them. The demands for controlling emotional arousal when the toys are invisible are less than the demands for controlling arousal when the toys are visible. As shown in Figure 5, the demands for emotional self-regulation in both low and high conditions were well below the limit of both 3- and 5-year-olds. In other words, the children in both age groups could complete the task without losing control of their emotions (e.g. cry because of frustration, or leave the room).

![Figure 5. Task emotional demands in relation to the limit of emotional self-regulation](image)
Figure 6 depicts the demands and the limits for behavioral self-regulation. The demands are ranked based on degree of difficulty to comply with them. Low demands are placed at the bottom of the figure.

Demands for behavioral self-regulation

limit of 5-year-olds

sort and avoid toys (work on task)

limit of 3-year-olds

avoid toys but focus on them (look at toys)
avoid toys, focus on something else (do nothing)
do not sort, do not avoid toys (play with toys)

Figure 6. Task demands for compliance in relation to the limit of behavioral self-regulation

Five-year-olds have greater resources for behavioral self-regulation than the 3-year-olds (Figure 6). Therefore, the limit line of the 5-year-olds is higher than the limit line of the 3-year-olds. All of the task demands for behavioral self-regulation were below the limit for the 5-year-olds. However, for the 3-year-olds, the demands for sorting and avoiding the toys are above their limit. Consequently, the 3-year-olds worked on task only as long as their limited resources allowed them to do.

Three general principles are introduced to explain the relationship between behavioral and emotional self-regulation. The first principle assumes that varying the demands for emotional self-regulation will not differentially affect behavioral self-regulation (i.e., compliance) when the task demands for behavioral self-regulation are beyond the limit. This was the case with work on task for the 3-year-olds. There was not a significant difference in the amount of time children worked in the low versus the high

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condition. However, looking at toys and do nothing reflect fewer demands for compliance (they are placed below the limit line for the 3-year-olds in Figure 6). These behaviors were affected by the varying demands for emotional self-regulation. Similarly, work on task, and look at toys were below the 5-year-olds’ limit, therefore, they were well within their capacity. Consequently, varying the demands for emotional self-regulation had a differential effect on compliance. Children worked less and looked more at the toys in the high demand condition.

The second principle states that emotional self-regulation has a greater effect on behaviors whose demands for compliance are closer to the limit of behavioral self-regulation. This is why in the high condition, the 3-year-olds looked more at the toys and they were less likely to do nothing than the 5-year-olds (i.e., both behaviors are closer to the limit of the 3-year-olds than are to the limit of the 5-year-olds, as shown in Figure 6). In other words, the more difficulty the child has to comply with the behavioral demands of the task the greater the effect of the demands for emotional self-regulation is.

The third principle states that varying the demands for emotional self-regulation will have minimal effect on behavioral self-regulation when the demands for behavioral self-regulation are very low. This was the case with play with toys for the 3- and 5-year-olds. By choosing to play with the toys, children minimized the demands for compliance. There were practically no demands for compliance (i.e., in Figure 6, do not sort and do not avoid the toys are further away from the limit line of the 3- and 5-year-olds). Therefore, there was no significant change on play behavior when the demands
for emotional self-regulation varied. In other words, once children decide to play with the toys, it does not make any difference whether they can see the toys or not.

In summary, the model predicts the following: (a) increasing the emotional arousal of a task will not affect significantly children's performance if the task demands are already above the children's resources for behavioral self-regulation, (b) emotional arousal has a greater effect on behavior when the demands for behavior regulation are high but within the capacity of the child, and (c) emotional arousal has minimal effects on performance when the task does not demand behavior regulation.

This model views the relationship between behavioral and emotional self-regulation as dynamic and interactive. The organization of behavioral outcomes (i.e., the way children conduct themselves) depends on the interplay between the two. The validity and generality of this model needs to be addressed in future research. However, the model complements existing theory of emotional self-regulation, particularly the organizational or functional view. According to this theory, emotions are both inherently regulatory and can be regulated by social processes. (Campos, Mumme, Kermoian, & Campos, 1994).

Conclusions

The present study is the first to provide evidence for the association between behavioral and emotional self-regulation during the preschool period. The findings indicate that achieving higher levels of self-regulated compliance interacts with the acquisition of independent and problem-focused coping skills. On the other hand, aggression and venting are negatively correlated with self-regulated compliance. The
study also supported the hypothesis that this association becomes stronger with age. Emotional self-regulation contributes to the internalization of standards of behavior and the contribution increases with age. These findings significantly extend Kopp’s model of self-regulation.

The present study also demonstrates that the nature of the association is more complicated than previously assumed. Behavioral outcome depends on the demands for behavioral and emotional self-regulation of a particular situation and the resources of the child. An integrative model is proposed to explain the dynamics of the relationship between behavioral and emotional self-regulation.

THEORETICAL IMPLICATIONS

The findings of the present study validate and extend Kopp’s model (1982, 1989) of the development of self-regulation. The present research also makes significant contributions for new theory development. The proposed integrative model of behavioral and emotional self-regulation implies that any theory of self-regulation must consider the interaction between regulating emotions and behavior. Although, behavioral and emotional self-regulation are operationalized as conceptually different, one might assume that any human activity would include an emotional component. Therefore, studying how the two systems interact to determine behavioral outcome is of considerable importance. The model described earlier emphasizes examining the regulatory demands for behavior and emotions in conjunction with the resources of the individual at any given situation.
The present study also implies that although emotion regulation is evident very early in life, it develops slower than behavioral self-regulation. This conclusion is suggested by the greater number of age-related differences found in compliance as compared to coping strategies and the greater consistency found for compliance across ratings and experimental task. Young infants have a variety of means to cope with arousal such as gaze aversion and self-comforting techniques (Mangelsdorf et al., 1995). During the preschool period, however, there are only small changes in children’s coping strategies. In contrast, the process of adopting and internalizing standards of behavior seems to develop faster. The present research indicated that 5-year-olds need less external intervention to comply with a variety of rules than did the 3-year-olds. Coping with negative emotions, on the other hand, may be a long learning process.

Moreover, the correlations found between mothers’ and teachers’ compliance ratings were stronger than those found between their coping ratings. In addition, children who were rated as more compliant by mothers and teachers were more likely to work on task and less likely to look at and play with the toys. The findings, therefore, suggest greater cross-situational consistency in children’s behavioral self-regulation. This consistency may in turn indicate greater maturation.

Perhaps, because emotions are more bound to context and personal goals (Campos et al., 1994), the individual needs to adjust coping strategies accordingly. The role that parents play in that adjustment may also be of great importance. Parents may place more emphasis on compliance to behavioral rules than teaching coping strategies. Research indicates that parents of 2-year-olds encourage compliance significantly more
often than the parents of 4- and 6-year olds (Power et al., 1994). With, 4- and 6-year-olds, parents are more likely to make references to child feelings to elicit compliance, whereas parents of 2-year-olds emphasize the consequences of the child's actions (Power, McGrath, Hughes, & Manire, 1987). Consequently, it is possible that parents begin to make the association between controlling emotions and compliance clear to the children after the age of 4. This issue invites future investigation.

Overall, the present study validates and complements the existing theory of self-regulation. The results also highlight the need of a new theory to conceptualize the unique and interactive contributions of behavioral and emotional self-regulation systems in determining behavioral outcome. The theory should also accommodate the developmental changes in the way these systems function in relation to each other.

**Methodological implications**

In addition to theoretical implications, several methodological issues have emerged throughout the present study that deserve attention for future research. Counterbalancing the order of the conditions and the two toysets seemed to be a necessary experimental manipulation (Greenwald, 1976). Nevertheless, the statistical analyses showed some order and toyset effects. Although the order of presentation of the two experimental conditions did not have any significant main effects, it had a significant interaction with condition on several variables. The pattern of interaction was complex but the main result was that children worked more and played less in the low versus the high condition when they experienced the low condition first. The opposite effect took place when the children experienced the low condition second.
They tended to work more and play less in the high versus the low condition. Moreover, toyset B appeared to be more attractive than toyset A, despite the fact that pilot work indicated no difference in attractiveness.

It is rather difficult to explain these conflicting results. Despite the good intentions of an experimenter, it is often impossible to eliminate all sources of experimental error. Predicting the attractiveness of two toysets in a group of middle-class children might have been such an occasion. Nevertheless, the unexpected interactions involving order point to the need for examining statistically the effectiveness of any experimental manipulation. If significant effects emerge, they need to be considered in the analyses. In the present study, order and toyset did not interact with age and condition, and therefore, they were not expected to significantly affect the findings of the study. However, statistical attempts were made to reduce the variance due to order and toyset.

Another methodological implication is the need to use multiple measures and multiple sources of information. In the present research, experimental methods, rating scales, and interviews were used to assess behavioral and emotional self-regulation. Consistency among methods was indicated by the positive correlations between measures. Using multiple methods and multiple sources of information allows the examination of the generality and consistency of the children's behavior. The present research would have been complemented by naturalistic observations. Observing children's compliance and coping strategies in children's natural environment would have significantly increased the ecological validity of the study (Bronfenbrenner, 1979).
The present research also highlights the need to develop new methods to study emotional self-regulation. In this study, emotional self-regulation during the task was measured by rating the children’s emotional comfort. Although the rating was validated by the children’s responses to the interview, its subjective nature limits its generality. The evaluation of facial expressions and physiological responses are commonly used in research on children’s emotional regulation. These methods were not applicable to this research. Therefore, new methodologies are needed to allow measuring both behavioral and emotional self-regulation in the same task.

In sum, the present study points to the need to examine statistically the effectiveness of counterbalancing, draws attention to the use of multiple measures, and highlights the need to develop new methodologies to measure behavioral and emotional self-regulation in the same task.

CONCLUSIONS AND FUTURE DIRECTIONS

The main hypotheses of the study were supported. A clear age-related increase in self-regulated compliance was found, thus, supporting the expected age-related increase in behavioral self-regulation. The findings from the sorting task highlight the value of examining the development of compliance in a setting that provides minimal external support.

An age-related increase in the ability to maintain a positive state during the emotionally-demanding situation of the experimental task supported the expected increase in emotional self-regulation. Preschool children seem to make at least some progress in acquiring more independent, problem-focused coping strategies. However,
the literature on age-related changes on coping strategies is still limited and future research needs to address this gap.

Gender differences in coping strategies demonstrate that boys are more likely to cope with their frustration in an aggressive manner whereas girls are more likely to ask for emotional support, seek help, or take their own action to solve the problem. Future research should examine how personal goals affect the coping strategies that girls and boys choose to adopt. In addition, girls were rated by mothers and teachers as more compliant than boys.

The present study is the first to provide evidence for the association between behavioral and emotional self-regulation during the preschool period. The findings indicate that higher levels of self-regulated compliance are associated with independent and problem-focused coping strategies. On the other hand, emotion-focused strategies, such as aggression and venting, are negatively correlated with self-regulated compliance. The study also supported the hypothesis that the association becomes stronger with age. Emotional self-regulation contributes to the internalization of standards of behavior and the contribution increases with age. Behavioral self-regulation shows greater consistency across contexts than emotional self-regulation during the preschool period, perhaps because behavioral self-regulation develops faster. These findings significantly extend Kopp’s model of self-regulation by demonstrating the relationship between behavioral and emotional self-regulation as well as age-related changes in the relationship.
Behavioral outcome depends on the resources available to the child and the
demands for behavioral and emotional self-regulation of a particular situation. A new
integrative model was proposed to explain the dynamics of the relationship between
behavioral and emotional self-regulation. Future research is needed to examine the
generality of this model.

The present research could be expanded in several ways. One important factor
that significantly contributes to the development of self-regulation is temperament. The
investigation of the association between temperament and behavioral self-regulation has
received sparse attention, although self-regulation theorists have speculated that such a
relationship exists. Kopp (1982) claimed that “children are not inherently motivated to
comply with everyday rules”, but compliance is energized by the relationship with
parents and other socializing agents. It is well-known that temperamental characteristics
influence parental behavior (Bell & Chapman, 1986; Thomas & Chess, 1977) and
discipline techniques (Patterson, 1982) which in turn influence compliance in children
(Kochanska, 1997a; Kopp, 1991). Based on temperament and parenting literature,
temperament would be expected to influence the development of behavioral self-
regulation.

Research on the role of temperament in the development of behavioral self-
regulation can be advanced by examining a broader range of temperamental dimensions,
using a broader index of behavioral self-regulation and investigating the developmental
course of the association between temperament and behavioral self-regulation.
Moreover, there is a tendency of viewing temperament as a source of variability in the ability to emotionally regulate the self (Calkins, 1994). It has been proposed that temperamental traits influence the coping strategies that children eventually develop and in essence, explain individual variation in controlling emotions (Kagan, 1994). The studies that have examined the role of temperament in emotional self-regulation usually focus on one temperamental dimension (e.g., Eisenberg et al., 1994; Mangelsdorf et al., 1995). Future research should provide a detailed account of temperamental contributions to emotional self-regulation by examining a wider range of temperamental dimensions and their role in the development of coping skills in the preschool period.

Investigating the role of parents in the development of emotional self-regulation is another topic for future research. Researchers have mainly focused on how parents assist in the internalization of standards of behavior and the discipline techniques they use to elicit compliance (Hardy et al., 1993; Kochanska, 1997b; Power & Manire, 1992). Little, however, has been done on how the parents’ own coping strategies affect the coping strategies of their own children. It is possible, for example, that parents who use more emotion-focused strategies have children who develop similar coping skills. In addition, the parents’ own emotionality and feelings about themselves may influence their children’s coping (e.g., parents with low self-esteem may have children who use more emotion-focused strategies which are less effective).

Examining the role of the caregiver in non-typical families would be of enormous importance. For example, in single parent families, the level of life stress usually tends to be higher (Hetherington, 1989). The way parents handle stress may
affect not only children’s emotional self-regulation but also their psychological adjustment.

This further brings up another interesting issue: how the development of behavioral and emotional self-regulation affects psychological adaptation and particularly school adjustment. Future research should examine these relationships during school transitional periods such as from kindergarten to grade school. Identifying techniques that help children cope with their new environments would be of great applied interest.

Finally, investigating the cognitive mechanisms involved in coping with stress and behavior regulation (e.g., problem solving, representational thinking and execution of verbal rules, comprehension and internalization of standards of behavior) would be a great area of future research.

In summary, the results of this study demonstrate an age-related increase in behavioral self-regulation during the preschool period as indicated by self-monitored compliance during a delay-sorting task, and by mothers’ and teacher’s ratings. Emotional self-regulation also increases during the preschool period, demonstrating that preschoolers slowly acquire independent and problem-focused strategies. A strong association between behavioral and emotional self-regulation was supported. The interactive model of behavioral and emotional self-regulation is proposed to explain the dynamic and reciprocal interaction between the two. Future research to explore the generality of these findings seems warranted.
REFERENCES


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APPENDIX A: CONSENT FORM

LOUISIANA STATE UNIVERSITY-BATON ROUGE CAMPUS

Consent form

1. **Study title:** “The development of children’s reactions and behavior during the preschool years”

2. **Performance Sites:**

3. **Investigators:**
   
   **Name:** Maria Kalpidou, Ph.D. candidate  
   **Department:** Psychology Department, LSU  
   **Address:** 236 Audubon Hall  
   **City:** Baton Rouge, LA 80803  
   **Telephone number:** (504) 388-8745 (O) (504) 767-8706 (H)  
   
   **Name:** Nathan Gottfried, Ph.D.  
   **Department:** Psychology Department, LSU  
   **Address:** 236 Audubon Hall  
   **City:** Baton Rouge, LA 70803  
   **Telephone number:** (504) 388-0426 (O)

4. **Purpose of the Study:** To study the development of children’s behavioral and emotional reactions to various situations during the preschool period. Of particular interest is how the children’s characteristics influence the way they deal with tasks.

5. **People included in the study:** The study includes children aged 3-5 years old, their mothers, and their teachers.

6. **Description of the Study:** Data collection will involve teachers, mothers and children. Mothers and teachers will receive a questionnaire to fill about children’s characteristics. The children will participate in two brief tasks that involve a sorting task in the presence of attractive toys.

   The children will be called by the experimenter who will take them to a room in the same school building. The experimenter will spend some time with the children before the data collection begins to get acquainted.

   The children will be asked to stay in the room and sort plastic spoons and forks. After 10 minutes the experimenter will return to the room and let the children play with the attractive toys. All procedures will be videotaped by a hidden
camcorder and the children will not be told about it. The children will also be asked questions about how they felt and what they thought during the task.

7. **Benefits:** Mothers and children participating in this study will significantly contribute to our understanding of child development. Parents participating in the study will receive a report of the results upon completion.

8. **Risks:** None.

9. **Alternatives:** Not applicable.

10. **Removal:** Not applicable.

11. **Right to Refuse:** All subjects participating in the research have the right to withdraw at any time by simply informing the experimenter in person, by letter, or by phone. There are no consequences or penalty related to withdrawal.

12. **Privacy:** The results of the study may be published. However, the privacy of the participating subjects will be protected and their identity will be kept secret.

13. **Release of information:** All data will be kept in a locked office accessible only to the investigators. Subjects will be assigned numbers during the analysis of the data. Any presentation of the data will refer to as anonymous group data.

14. **Financial Information:** There are no costs for participation.

15. **Signatures:**

The study has been discussed with me and all my questions have been answered. I understand that additional questions regarding the study should be directed to the investigators listed above. I understand that if I have questions about subject rights, or other concerns, I can contact the Vice Chancellor of the LSU Office of Research and Economic Development at 388-5833. I agree with the terms above and acknowledge I have been given a copy of the consent form.

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<th>Signature of the Mother/Guardian</th>
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<tr>
<th>Investigators</th>
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We would like to keep the videotapes for possible additional analyses in future projects. If you agree, we will keep the segments of the tape referring to your child. If you do not agree, we will erase them after the end of this project. In case you allow us to keep the

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video-taped segments, the anonymity of your child will be protected and confidentiality
will be ensured. Please sign the option that fits better to you.

I give permission to the experimenter to maintain the video-taped segments involving
my child.

________________________
Signature of the Mother/Guardian

Please destroy the video-taped segments involving my child.

________________________
Signature of the Mother/Guardian
APPENDIX B: DEMOGRAPHIC DATA SHEET

GENERAL INFORMATION

CHILD:

Name: ________________________________________________________________

Sex: M  F  (circle one)

Race: ________________________________________________________________

Date of birth: _______________________________________________________

Siblings: Males/ages: ________________________________________________

Females/ages: _______________________________________________

Approximate time being at Day Care so far: _____________________________

FAMILY:

Marital status: Married  Divorced  Separated  Unmarried single mother (circle one)

Mother's age: ______

Father's age: ______

Mother's occupational status (circle one):

unskilled  semiskilled  skilled  semiprofessional  professional

Father's occupational status (circle one):

unskilled  semiskilled  skilled  semiprofessional  professional

Mother's degree (circle one):

High School  College  Some or Technical College training  Degree

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Father's degree (circle one):

| High School | Some or Technical College training | College Degree | Graduate Degree |
APPENDIX C: CODING SYSTEM OF BEHAVIORAL REACTIONS DURING THE COMPLIANCE-DELAY TASK

The following instructions for coding the observational categories are used in conjunction with the software PSCODE (Karadimitriou, 1997) that was developed to facilitate the coding process. The program is synchronized in time with the VCR while the coder observes the video-taped segments. The coder chooses the codes by clicking the appropriate box on the screen. The program provides summaries of the duration and frequency of each code. Detailed descriptions of the codes are provided next.

Serious sorting: The children sort the spoons and forks in a serious plain manner. There is no indication that children attempt to turn the activity into a playful one. Sorting may take place in slow or fast motion. The children may verbalize, move, or sing during serious sorting. If they look at the toys while sorting, code only look at toys. If the children stop sorting, but they still keep cutlery in their hands, while they divert their attention to something else, wait for 3 seconds and then code table do nothing. It should be apparent that the children discontinue the activity to attend to something else (e.g., a sound). Sometimes, they stop sorting but they are still involved in the task; for example, they look for mistakes in the boxes. In these cases, continue coding serious sorting. When children drop something while in the middle of sorting, continue coding serious sorting if their attention is not distracted by something else. If they look at the toys on their way to pick up the cutlery, you have to code look at toys. If it takes them more than 3 seconds to get off their chair (for example, they slide down the chair slowly) you must code table do nothing. Go back to serious sorting as soon as they pick up what they dropped.
**Material play:** The children keep the spoons and forks in their hands for more than 3 seconds without sorting. There is no need to stop the VCR or the computer. The program will automatically assign 3 sec to this category when it is selected. Give credit for putting the spoons and forks in the boxes (even 1 second). Putting the spoons and forks in the box may be done in a playful or serious way. Choose the appropriate code for that. If the children are involved in material play, then in look at toys, and then go back to work do not code material play right away because the computer will go back 3 seconds and that means it will erase the time assigned for looking at toys. Click instead on serious sorting and if they still hold the spoons and forks for 3 seconds, click on material play.

**Playful sorting:** The children work with the spoons and forks in a playful way. The sorting becomes a continuous entertaining activity (e.g., the spoons and forks fly like airplanes before they are put in the boxes; the spoons and forks are dropped from height; fingers are extended in a playful way; spoons and forks are let to roll off the fingers; children use one hand for the spoons and the other for the forks at the same time).

**Gentle touch:** the children touch the toys for at least 2 s and do so tentatively and in a restrained fashion. The computer will automatically assign 2 seconds, therefore, you do not have to stop the VCR or the computer.

**Play with toys:** The children play with the toys in an unrestrained and manipulative way (turning the toys, lifting them, pushing their buttons).
 Look at toys: The children look at the toys without touching. When children touch or play with the toys, look at toys is not scored. In the low condition, do not code look at toys unless the children go around the bookcase to see the toys.

Table do nothing: The children sit on chair or stand by the chair but do not work. The children do something else other than look at toys. If the children hold spoons and forks but they do not play with them neither do they put them in the box, wait for 3 s, and then assign the code of table do nothing.

Room do nothing: The children are away from the table and do not work. The children do something else other than look at toys.

Off camera: The child is off camera and the coder cannot make inferences about the child’s behavior.
APPENDIX D: QUESTIONNAIRES OF BEHAVIORAL SELF-REGULATION.

COMPLIANCE SCALE FOR MOTHERS

Child’s name: ____________________________

We would like to ask you to check how your child responds to the following prohibitions and requests. You are given four choices:
1 = never conforms  
2 = conforms only with intervention  
3 = conforms sometimes without intervention  
4 = conforms mostly without being reminded

PLEASE CHECK THE APPROPRIATE BOX

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<td>2. Not climbing on furniture</td>
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<td>5. Not tearing up books</td>
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<td>6. Not getting into prohibited drawers or rooms</td>
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<td>7. Not coloring on walls or furniture</td>
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<td>8. Not taking toys away from other children</td>
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<td>10. Not playing with food</td>
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<td>11. Not leaving table in the middle of meal</td>
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<td>12. Not spilling drinks, juice</td>
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<td>13. Waiting when Mom is on the telephone</td>
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14. Not interrupting other's conversations .............. □ □ □ □
15. Waiting for a meal ........................................... □ □ □ □
16. Saying "please" ................................................ □ □ □ □
17. Saying "thank you" .......................................... □ □ □ □
18. Dressing self .................................................. □ □ □ □
19. Asking to use the toilet ..................................... □ □ □ □
20. Washing up when requested .............................. □ □ □ □
21. Brushing teeth when requested .......................... □ □ □ □
22. Going to bed when requested ............................. □ □ □ □
23. Helping with chores when requested .................. □ □ □ □
24. Putting toys away ............................................. □ □ □ □
25. Keeping room neat .......................................... □ □ □ □

COMPLIANCE SCALE FOR TEACHERS

Child's name: ________________________________

We would like to ask you how this child responds to the following prohibitions and requests. You are given four choices:
1 = never conforms
2 = conforms only with intervention
3 = conforms sometimes without intervention
4 = conforms mostly without being reminded

PLEASE CHECK THE APPROPRIATE BOX

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<td>5. Not tearing up books</td>
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<tr>
<td>6. Not getting into prohibited drawers or rooms</td>
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<tr>
<td>7. Not coloring on walls or furniture</td>
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<td>8. Not taking toys away from other children</td>
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<td>9. Not being too rough with other children</td>
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<tr>
<td>10. Not playing with food</td>
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<tr>
<td>11. Not leaving table in the middle of meal</td>
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<tr>
<td>12. Not spilling drinks, juice</td>
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<tr>
<td>13. Waiting when teacher is busy</td>
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<tr>
<td>14. Not interrupting other's conversations</td>
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<tr>
<td>15. Waiting for a turn</td>
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<tr>
<td>16. Saying &quot;please&quot;</td>
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<td>17. Saying &quot;thank you&quot;</td>
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<tr>
<td>18. Dressing self</td>
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<tr>
<td>19. Asking to use the toilet</td>
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<tr>
<td>20. Washing up when requested</td>
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<tr>
<td>21. Going down to nap when requested</td>
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<tr>
<td>22. Helping with chores when requested</td>
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<tr>
<td>23. Putting toys away</td>
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<tr>
<td>24. Keeping class clean</td>
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</table>
APPENDIX E: QUESTIONNAIRES OF EMOTIONAL SELF-REGULATION

MOTHERS’ REPORTS OF COPING SKILLS

Child’s name ________________________________

For each of the following situations that children are likely to encounter, please rate on a 7-point scale how likely your child would be to do each of the following things. Be sure to rate each question. Put the number that best describes your rating.

1. When your child is upset because other children made fun of him/her, how likely is your child to do the following:

1  2  3  4  5  6  7
not at somewhat extremely
all likely likely likely

_____ Actively tells himself/herself that it isn’t really something to get upset about or it isn’t really that serious (cognitive restructuring).

_____ Does something else to forget about the problem like playing a new game or playing with other children (distraction).

_____ Physically or verbally tries to hurt someone or something else because that’s how he/she releases pent-up or frustrated feelings (emotional aggression).

_____ Cries to release his/her own pent-up or frustrated feelings (venting).

_____ Seeks the emotional support of an adult, but does not cry (emotional support).

_____ Stays away from the children or leaves the scene (avoidance).

_____ Cries so that an adult intervenes so that he/she won’t be made fun of (emotional intervention).

_____ Does something constructive to make them stop making fun of him/her (e.g., asks them why they won’t play) (instrumental coping).

_____ Hits or yells at the children who are making fun of him/her so they will stop (instrumental aggression).

181
1. **Does nothing (doing nothing).**

2. **When your child is upset because other children have started a game and will not let him/her play, how likely is your child to do the following:**

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</table>

- **Actively tells himself/herself that it isn't really something to get upset about or it isn't really that serious (cognitive restructuring).**
- **Does something else to forget about the problem like playing a new game or finding other children to play with (distraction).**
- **Physically or verbally tries to hurt someone or something else because that's how he/she releases pent-up or frustrated feelings (emotional aggression).**
- **Cries to release his/her own pent-up or frustrated feelings (venting).**
- **Seeks the emotional support of an adult, but does not cry (emotional support).**
- **Stays away from the other children or leaves the scene (avoidance).**
- **Cries to get an adult to intervene so that the other children will let him/her play (emotional intervention).**
- **Asks the other children why they won't let him/her play (instrumental coping).**
- **Disrupts the game so that the other children can't play (instrumental aggression).**
- **Does nothing (doing nothing).**

3. **When your child is upset because a peer purposely destroys something your child is making or disrupts your child during a pleasurable activity, how likely is your child to do the following:**

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<td>extremely likely</td>
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</table>

- **Does nothing (doing nothing).**
Actively tells himself/herself that it isn’t really something to get upset about (cognitive restructuring).

Tries to forget about it by talking to other children or doing something interesting (distraction).

Physically or verbally tries to hurt someone or something else because that’s how he/she releases pent-up or frustrated feelings (emotional aggression).

Cries to release his/her own pent-up or frustrated feelings (venting).

Seeks the emotional support of an adult, but does not cry (emotional support).

Stays away from the other child (avoidance).

Cries so that an adult intervenes to makes the peer apologize (emotional intervention).

Tries to find out why the other child did it (instrumental coping).

Hits or yells at other child so that he/she won’t do it again (instrumental aggression).

Does nothing (doing nothing).

4. When your child is upset because he/she accidentally broke his/her favorite toy, how likely is your child to do the following:

1  2  3  4  5  6  7
not at all likely somewhat likely extremely likely

Actively tells himself/herself that it isn’t really something to get upset about or it isn’t really that serious (cognitive restructuring).

Does something else to forget about the broken toy (distraction).

Physically or verbally tries to hurt someone or something else because that’s how he/she releases pent-up or frustrated feelings (emotional aggression).

Cries to release his/her own pent-up or frustrated feelings (venting).
Seeks the emotional support of an adult, but does not cry (emotional support).

Stays away from the upsetting situation (avoidance).

Cries until an adult intervenes so that the toy is repaired (emotional intervention).

Does something constructive to repair the toy (e.g., looks for glue) (instrumental coping).

Hits or yells at others to fix the toy (instrumental aggression).

Does nothing (doing nothing).

5. When your child is upset because she/he fails to put a puzzle together, how likely is your child to do the following:

1  2  3  4  5  6  7
not at all likely somewhat likely extremely likely

Actively tells himself/herself that it isn’t really something to get upset about or it isn’t really that serious (cognitive restructuring).

Does something else to forget about the problem like playing a new game or playing with other children (distraction).

Physically or verbally tries to hurt someone or something else because that’s how he/she releases pent-up or frustrated feelings (emotional aggression).

Cries to release his/her own pent-up or frustrated feelings (venting).

Seeks the emotional support of an adult, but does not cry (emotional support).

Stays away from the upsetting situation (avoidance).

Cries until an adult intervenes so that the puzzle is completed (emotional intervention).

Does something constructive to fix the puzzle (e.g., makes sure that all the pieces belong to the same puzzle) (instrumental coping).
6. When your child is upset because she/he wants a toy that you decided they cannot have, how likely is your child to do the following:

1 2 3 4 5 6 7

not at somewhat extremely likely likely

____ Acts actively tells himself/herself that it isn’t really something to get upset about or it isn’t really that serious (cognitive restructuring).

____ Does something else to forget about the attractive toy (distraction).

____ Physically or verbally tries to hurt someone or something else because that’s how he/she releases pent-up or frustrated feelings (emotional aggression).

____ Cries to release his/her own pent-up or frustrated feelings (venting).

____ Seeks the emotional support of an adult, but does not cry (emotional support).

____ Stays away from the upsetting situation (e.g., distances him/herself from the toy) (avoidance).

____ Cries until an adult intervenes so that the toy is attained (emotional intervention).

____ Does something constructive to get the toy (e.g., saves money, waits for birthday) (instrumental coping).

____ Hits or yells at others to get the toy (instrumental aggression).

____ Does nothing (doing nothing).

7. When your child is upset because a favorite toy was lost (examples: left it in the park, bus, mall, playground), how likely is your child to do the following:

1 2 3 4 5 6 7

not at somewhat extremely likely likely

____ Hits or yells at others to fix the puzzle (instrumental aggression).

____ Does nothing (doing nothing).
Actively tells himself/herself that it isn’t really something to get upset about or it isn’t really that serious (cognitive restructuring).

Does something else to forget about the missing toy (distraction).

Physically or verbally tries to hurt someone or something else because that’s how he/she releases pent-up or frustrated feelings (emotional aggression).

Cries to release his/her own pent-up or frustrated feelings (venting).

Seeks the emotional support of an adult, but does not cry (emotional support).

Stays away from the upsetting situation (e.g., distances him/herself from anything that remind him/her of the toy) (avoidance).

Cries until an adult intervenes so that the toy is found (emotional intervention).

Does something constructive such as promising to be more careful (instrumental coping).

Hits or yells at others to find the toy (instrumental aggression).

Does nothing (doing nothing).

8. When your child is upset because she/he must interrupt a favorite activity (examples: leave the playground and go home; stop playing and prepare for school), how likely is your child to do the following:

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<th>4</th>
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<th>7</th>
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<tbody>
<tr>
<td>not at all likely</td>
<td>somewhat likely</td>
<td>extremely likely</td>
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</table>

Actively tells himself/herself that it isn’t really something to get upset about or it isn’t really that serious (cognitive restructuring).

Does something else to forget about the problem like talking to others (distraction).

Physically or verbally tries to hurt someone or something else because that’s how he/she releases pent-up or frustrated feelings (emotional aggression).

Cries to release his/her own pent-up or frustrated feelings (venting).
____ Seeks the emotional support of an adult, but does not cry (emotional support).

____ Distances him/herself (e.g., hiding) (avoidance).

____ Cries until an adult intervenes so that the favorite activity is prolonged (emotional intervention).

____ Does something constructive (e.g., decides to continue the favorite activity at some other time) (instrumental coping).

____ Hits or yells others to prolong the favorite activity (instrumental aggression)

____ Does nothing (e.g., ignores) (does nothing)

GLOBAL SCALE

Now we would like to get your impressions about how your child generally deals with problems. Please read each item below and indicate, by using this 7-point scale, how likely it is your child generally to do the behavior when confronted with a problem situation.

1 2 3 4 5 6 7
not at all likely somewhat likely extremely likely

1. ____ Takes some constructive action to improve a problem situation (e.g., tell others to stop teasing) (instrumental coping).

2. ____ Cries to elicit assistance from others to help solve the problem (e.g., cry so that a teacher intervenes on the child's behalf when he or she is being bullied) (emotional intervention).

3. ____ Resolves problems through physical or verbal aggression (e.g., pushes or kicks a child who has been teasing him/her) (instrumental aggression).

4. ____ Avoids thinking about a problem or attempts to ignore it (e.g., fantasizes that things were different or wishes things were different) (avoidance).

5. ____ Leaves or avoids a problem situation (e.g., stays away from people who make him/her feel bad) (distraction).
6. _____ Avoids thinking about the problem by distracting himself/herself with other activities (e.g., stays away from people who make him/her feel bad) (cognitive avoidance).

7. _____ Tells problems to friends or family in hope of getting support (emotional support).

8. _____ Cries to release pent-up feelings or to elicit comfort from others (venting).

9. _____ Uses physical or verbal aggression to release pent-up feelings (e.g., kicking a wall after being embarrassed) (emotional aggression).

10. _____ Tries to think about the situation in a positive way (e.g., tells himself/herself everything will be OK, tries to put the problem in perspective) (cognitive restructuring).

11. _____ Asks an adult or another child to help solve the problem (instrumental intervention).

12. _____ Talks with a friend or family member about the problem to help find a solution (instrumental support).

13. _____ Denies that there really is a problem (denial).

14. _____ Does nothing (doing nothing).

TEACHERS' REPORTS OF COPING SKILLS

Child’s name ________________________________

For each of the following situations that children are likely to encounter, please rate on a 7-point scale how likely this child would be to do each of the following things. Be sure to rate each question. Put the number that best describes your rating.

1. When this child is upset because other children made fun of him/her, how likely is this child to do the following:

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<td>not at all likely</td>
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</table>

_____ Actively tells himself/herself that it isn’t really something to get upset about or it isn’t really that serious (cognitive restructuring).
1. What is the most likely way this child will respond when upset because other children have started a game and will not let him/her play?

____ Does something else to forget about the problem like playing a new game or playing with other children (distraction).

____ Physically or verbally tries to hurt someone or something else because that's how he/she releases pent-up or frustrated feelings (emotional aggression).

____ Cries to release his/her own pent-up or frustrated feelings (venting).

____ Seeks the emotional support of an adult, but does not cry (emotional support).

____ Stays away from the children or leaves the scene (avoidance).

____ Cries so that an adult intervenes so that he/she won't be made fun of (emotional intervention).

____ Does something constructive to make them stop making fun of him/her (e.g., asks them why they won't play) (instrumental coping).

____ Hits or yells at the children who are making fun of him/her so they will stop (instrumental aggression).

____ Does nothing (doing nothing).

2. When this child is upset because other children have started a game and will not let him/her play, how likely is this child to do the following:

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<td>extremely likely</td>
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____ Actively tells himself/herself that it isn’t really something to get upset about or it isn’t really that serious (cognitive restructuring).

____ Does something else to forget about the problem like playing a new game or finding other children to play with (distraction).

____ Physically or verbally tries to hurt someone or something else because that’s how he/she releases pent-up or frustrated feelings (emotional aggression).

____ Cries to release his/her own pent-up or frustrated feelings (venting).

____ Seeks the emotional support of an adult, but does not cry (emotional support).
Stays away from the other children or leaves the scene (avoidance).

Cries to get an adult to intervene so that the other children will let him/her play (emotional intervention).

Asks the other children why they won’t let him/her play (instrumental coping).

Disrupts the game so that the other children can’t play (instrumental aggression).

Does nothing (doing nothing)

3. **When this child is upset because a peer purposely destroys something this child is making or disrupts this child during a pleasurable activity, how likely is this child to do the following:**

1  2  3  4  5  6  7

not at all likely  somewhat likely  extremely likely

Actively tells himself/herself that it isn’t really something to get upset about (cognitive restructuring).

Tries to forget about it by talking to other children or doing something interesting (distraction).

Physically or verbally tries to hurt someone or something else because that’s how he/she releases pent-up or frustrated feelings (emotional aggression).

Cries to release his/her own pent-up or frustrated feelings (venting).

Seeks the emotional support of an adult, but does not cry (emotional support).

Stays away from the other child (avoidance).

Cries so that an adult intervenes to makes the peer apologize (emotional intervention).

Tries to find out why the other child did it (instrumental coping).

Hits or yells at other child so that he/she won’t do it again (instrumental aggression).
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____ Does nothing (doing nothing).

4. When this child is upset because he/she accidentally broke his/her favorite toy, how likely is this child to do the following:

1  2  3  4  5  6  7
not at  somewhat  extremely
all likely  likely  likely

____ Actively tells him/herself that it isn’t really something to get upset about or it isn’t really that serious (cognitive restructuring).

____ Does something else to forget about the broken toy (distraction).

____ Physically or verbally tries to hurt someone or something else because that’s how he/she releases pent-up or frustrated feelings (emotional aggression).

____ Cries to release his/her own pent-up or frustrated feelings (venting).

____ Seeks the emotional support of an adult, but does not cry (emotional support).

____ Stays away from the upsetting situation (avoidance).

____ Cries until an adult intervenes so that the toy is repaired (emotional intervention).

____ Does something constructive to repair the toy (e.g., looks for glue) (instrumental coping).

____ Hits or yells at others to fix the toy (instrumental aggression).

____ Does nothing (doing nothing)

5. When this child is upset because she/he fails to put a puzzle together, how likely is this child to do the following:

1  2  3  4  5  6  7
not at  somewhat  extremely
all likely  likely  likely

____ Actively tells him/herself that it isn’t really something to get upset about or it isn’t really that serious (cognitive restructuring).

____ Does something else to forget about the problem like playing a new game or
playing with other children (distraction).

_____ Physically or verbally tries to hurt someone or something else because that's how he/she releases pent-up or frustrated feelings (emotional aggression).

_____ Cries to release his/her own pent-up or frustrated feelings (venting).

_____ Seeks the emotional support of an adult, but does not cry (emotional support).

_____ Stays away from the upsetting situation (avoidance).

_____ Cries until an adult intervenes so that the puzzle is completed (emotional intervention).

_____ Does something constructive to fix the puzzle (e.g., makes sure that that all the pieces belong to the same puzzle) (instrumental coping).

_____ Hits or yells at others to fix the puzzle (instrumental aggression).

_____ Does nothing (doing nothing).

6. When this child is upset because she/he wants a toy that you decided they cannot have, how likely is this child to do the following:

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</table>

_____ Actively tells himself/herself that it isn’t really something to get upset about or it isn’t really that serious (cognitive restructuring).

_____ Does something else to forget about the attractive toy (distraction).

_____ Physically or verbally tries to hurt someone or something else because that’s how he/she releases pent-up or frustrated feelings (emotional aggression).

_____ Cries to release his/her own pent-up or frustrated feelings (venting).

_____ Seeks the emotional support of an adult, but does not cry (emotional support).

_____ Stays away from the upsetting situation (e.g., distances him/herself from the toy) (avoidance).
____ Cries until an adult intervenes so that the toy is attained (emotional intervention).

____ Does something constructive to get the toy (e.g., negotiates) (instrumental coping).

____ Hits or yells at others to get the toy (instrumental aggression).

____ Does nothing (doing nothing)

7. **When this child is upset because a favorite toy was lost (examples: left it in playground), how likely is this child to do the following:**

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<td>extremely likely</td>
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</tbody>
</table>

____ Actively tells himself/herself that it isn’t really something to get upset about or it isn’t really that serious (cognitive restructuring).

____ Does something else to forget about the missing toy (distraction).

____ Physically or verbally tries to hurt someone or something else because that’s how he/she releases pent-up or frustrated feelings (emotional aggression).

____ Cries to release his/her own pent-up or frustrated feelings (venting).

____ Seeks the emotional support of an adult, but does not cry (emotional support).

____ Stays away from the upsetting situation (e.g., distances him/herself from anything that remind him/her of the toy) (avoidance).

____ Cries until an adult intervenes so that the toy is found (emotional intervention).

____ Does something constructive such as promising to be more careful (instrumental coping).

____ Hits or yells at others to find the toy (instrumental aggression).

____ Does nothing (doing nothing).
8. When this child is upset because she/he must interrupt a favorite activity (examples: leave the playground and go home; stop playing and prepare for school), how likely is this child to do the following:

<table>
<thead>
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</table>

____ Actively tells himself/herself that it isn’t really something to get upset about or it isn’t really that serious (cognitive restructuring).

____ Does something else to forget about the problem like talking to others (distraction).

____ Physically or verbally tries to hurt someone or something else because that’s how he/she releases pent-up or frustrated feelings (emotional aggression).

____ Cries to release his/her own pent-up or frustrated feelings (venting).

____ Seeks the emotional support of an adult, but does not cry (emotional support).

____ Distances him/herself (e.g., hiding) (avoidance).

____ Cries until an adult intervenes so that the favorite activity is prolonged (emotional intervention).

____ Does something constructive (e.g., decides to continue the favorite activity at some other time) (instrumental coping).

____ Hit or yell others to prolong the favorite activity (instrumental aggression).

____ Does nothing (e.g., ignores) (does nothing).

GLOBAL SCALE

Now we would like to get your impressions about how this child generally deals with problems. Please read each item below and indicate, by using this 7-point scale, how likely it is this child generally to do the behavior when confronted with a problem situation. Be sure to rate each item.
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>not at all likely</td>
<td>somewhat likely</td>
<td>extremely likely</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>_____ Takes some constructive action to improve a problem situation (e.g., tell others to stop teasing) (instrumental coping).</td>
<td></td>
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<tr>
<td>2.</td>
<td>_____ Cries to elicit assistance from others to help solve the problem (e.g., cry so that a teacher intervenes on the child’s behalf when he or she is being bullied) (emotional intervention).</td>
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<tr>
<td>3.</td>
<td>_____ Resolves problems through physical or verbal aggression (e.g., pushes or kicks a child who has been teasing him/her) (instrumental aggression).</td>
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<tr>
<td>4.</td>
<td>_____ Avoids thinking about a problem or attempts to ignore it (e.g., fantasizes that things were different or wishes things were different) (avoidance).</td>
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<tr>
<td>5.</td>
<td>_____ Leaves or avoids a problem situation (e.g., stays away from people who make him/her feel bad) (distraction).</td>
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</tr>
<tr>
<td>6.</td>
<td>_____ Avoids thinking about the problem by distracting himself/herself with other activities (e.g., stays away from people who make him/her feel bad) (cognitive avoidance).</td>
<td></td>
<td></td>
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<tr>
<td>7.</td>
<td>_____ Tells problems to friends or family in hope of getting support (emotional support).</td>
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<td></td>
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<tr>
<td>8.</td>
<td>_____ Cries to release pent-up feelings or to elicit comfort from others (venting).</td>
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</tr>
<tr>
<td>9.</td>
<td>_____ Uses physical or verbal aggression to release pent-up feelings (e.g., kicking a wall after being embarrassed) (emotional aggression).</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>10.</td>
<td>_____ Tries to think about the situation in a positive way (e.g., tells himself/herself everything will be OK, tries to put the problem in perspective) (cognitive restructuring).</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>11.</td>
<td>_____ Asks an adult or another child to help solve the problem (instrumental intervention).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>12.</td>
<td>_____ Talks with a friend or family member about the problem to help find a solution (instrumental support).</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>13.</td>
<td>_____ Denies that there really is a problem (denial).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>_____ Does nothing (doing nothing).</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
APPENDIX F: CHILD INTERVIEW SCHEDULE

CHILD'S NAME: ........................................................................................................

Instructions:
Before you can play with the toys, I would like to ask you a few questions. Would you, please, sit on your chair?

1. DID YOU LIKE WORKING WITH THE SPOONS AND FORKS?

YES
Did you like to work with the spoons and forks a lot?.................................4
OR did you like it a little?..................................................................................3

NO
How much did you not like it? a lot?...............................................................2
OR a little?.........................................................................................................1

2. DID YOU WANT TO PLAY WITH THE TOYS?

YES
Did you want to play with the toys a lot? ......................................................1
Or a little?..........................................................................................................2

NO
Did you really really not want to play ?.......................................................4
OR you just did not want to play?.................................................................3

3. WAS IT HARD WAITING TO PLAY WITH THE TOYS?

YES
Was it very hard?.............................................................................................1
Or was it a little hard? ......................................................................................2

NO
Was it very easy to wait ? ..............................................................................4
OR was it a little easy? ....................................................................................3
4. IS THERE ANYTHING YOU THOUGHT ABOUT TO HELP YOU WAIT?

5. IS THERE ANYTHING YOU DID TO HELP YOU WAIT?

6. DID YOU TOUCH THE TOYS?
    YES    NO
APPENDIX G: TABLES OF INTERNAL CONSISTENCY AND RELIABILITY

Table 23. Cronbach’s alphas for coping items across the eight scenarios

<table>
<thead>
<tr>
<th>Item</th>
<th>MOTHERS’ RATINGS</th>
<th>TEACHERS’ RATINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive restructuring</td>
<td>.88</td>
<td>.91</td>
</tr>
<tr>
<td>Distraction</td>
<td>.76</td>
<td>.85</td>
</tr>
<tr>
<td>Emotional aggression</td>
<td>.88</td>
<td>.91</td>
</tr>
<tr>
<td>Venting</td>
<td>.84</td>
<td>.90</td>
</tr>
<tr>
<td>Emotional support</td>
<td>.77</td>
<td>.91</td>
</tr>
<tr>
<td>Avoidance</td>
<td>.59</td>
<td>.74</td>
</tr>
<tr>
<td>Emotional intervention</td>
<td>.82</td>
<td>.92</td>
</tr>
<tr>
<td>Instrumental coping</td>
<td>.78</td>
<td>.83</td>
</tr>
<tr>
<td>Instrumental aggression</td>
<td>.86</td>
<td>.83</td>
</tr>
<tr>
<td>Does nothing</td>
<td>.82</td>
<td>.92</td>
</tr>
</tbody>
</table>

Note. The items appear in the same order in each scenario.

Table 24. Cronbach’s alphas for scenarios, global scale, and compliance scales

<table>
<thead>
<tr>
<th>Scenario</th>
<th>MOTHERS’ RATINGS</th>
<th>TEACHERS’ RATINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.70</td>
<td>.70</td>
</tr>
<tr>
<td>2</td>
<td>.67</td>
<td>.67</td>
</tr>
<tr>
<td>3</td>
<td>.65</td>
<td>.68</td>
</tr>
<tr>
<td>4</td>
<td>.61</td>
<td>.68</td>
</tr>
<tr>
<td>5</td>
<td>.70</td>
<td>.60</td>
</tr>
<tr>
<td>6</td>
<td>.82</td>
<td>.70</td>
</tr>
<tr>
<td>7</td>
<td>.76</td>
<td>.73</td>
</tr>
<tr>
<td>8</td>
<td>.43</td>
<td>.65</td>
</tr>
<tr>
<td>Global</td>
<td>.61</td>
<td>.64</td>
</tr>
<tr>
<td>Compliance</td>
<td>.83</td>
<td>.92</td>
</tr>
</tbody>
</table>
Table 25. Inter-observer agreement on observational codes

<table>
<thead>
<tr>
<th>Code:</th>
<th>Rater A</th>
<th>Rater B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of comfort</td>
<td>.74</td>
<td>.80</td>
</tr>
<tr>
<td>Work on task</td>
<td>.87</td>
<td>.85</td>
</tr>
<tr>
<td>Material play</td>
<td>.79</td>
<td>.69</td>
</tr>
<tr>
<td>Look at toys</td>
<td>.85</td>
<td>.82</td>
</tr>
<tr>
<td>Do nothing</td>
<td>.88</td>
<td>.85</td>
</tr>
<tr>
<td>Play with toys</td>
<td>.92</td>
<td>.97</td>
</tr>
<tr>
<td>Time until first toy contact</td>
<td>1.00</td>
<td>.97</td>
</tr>
</tbody>
</table>

Note. Agreement is reported between the experimenter and each one of raters A and B.
**VITA**

Maria D. Kalpidou was born in Komotini, Greece, in 1967. She received a bachelor of arts degree in Early Childhood Education from Aristotle University of Thessaloniki, Greece, in 1990. The following year, she accepted a scholarship from Tufts University, Medford, Massachusetts, where she attended the graduate program at the Eliot-Pearson Department of Child Study. In 1993, she received a master of arts degree in Child Study. Her thesis research was a longitudinal study of the aversive interactions between mothers and their 21 to 48 month old children. She pursued doctoral studies in developmental psychology at the Department of Psychology, Louisiana State University, Baton Rouge, Louisiana. She anticipates receiving her doctor of philosophy degree in December, 1997. Her research interests include the development of self-regulation in young children, parent-child interactions, temperament, and social cognition.
DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Maria D. Kalpidou

Major Field: Psychology

Title of Dissertation: The Development of Behavioral and Emotional Self-regulation during the Preschool Period

Approved:

[Signatures]

DEAN OF THE GRADUATE SCHOOL

EXAMINING COMMITTEE:

[Signatures]

Date of Examination: October 15, 1997