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Emotional competence in children with ADHD:

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EMOTIONAL COMPETENCE IN CHILDREN WITH ADHD: THE CONTRIBUTION OF SYMPTOM SEVERITY

by

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Chapter One

Overview and Rationale of the Current Study

A growing number of psychopathologists believe that emotions have a central role in the etiology, presentation, and maintenance of psychological disorders. For example, the intensity and type of affect displayed characterizes many syndromes such as affective disorders, autism, and schizophrenia (Cicchetti & White, 1990). Emotions are clinically relevant to many other psychological disorders as well, although the influence of emotion may be less obvious.

In light of the apparent importance of emotion in psychopathology, it is striking that there has been little systematic research on the topic. Furthermore, most of the existing clinical literature on emotion concerns adults. Clinicians who work with children, therefore, typically have little understanding of the role of emotion in childhood psychological disorders. Even though one of the most active areas of research addresses the emotional development of infants and children, most developmentalists who study emotions of children do not focus on clinical populations. A more thorough understanding of the role of emotion in childhood psychopathology may help us learn how to better prevent, diagnose, and treat behavior problems in children. This study examined aspects of emotion in children with and without a common type of childhood behavior problem, Attention-Deficit Hyperactivity Disorder (ADHD).

The current study combined both clinical and develop-

mental approaches. It was guided by the understanding that as children develop from birth through the elementary school years, many physical, personality, social, and cognitive changes occur. It attempted to incorporate the knowledge that as children develop and participate in social activities, they begin to not only understand and construct their world, but also learn more subtle aspects of interactions such as social categories, regulations, and the types of responses expected.

As a result of applying such approaches, an assumption was formulated that an important contributor to these changes was the development of emotion expression, understanding, and regulation. Furthermore, the idea was proposed that the way children use, understand, and regulate emotions can have wide-ranging effects on many aspects of their development, especially their social functioning.

As a starting point to discussing the current study, a definition of emotion will be stated. It has already been set forth that emotions are the "basis for enduring personality dispositions" and that they "provide the core of continuity in the development of the self throughout the life span" (Campos, Campos, & Barrett, 1989, pp. 399-400). Dodge (1989) describes emotions as a coordination of responses within and between neurophysiological-biochemical, motor-expressive, and experiential-cognitive systems. Physiologically, the autonomic and somatic nervous system, which controls heart and breathing rates, changes as emotions change. Although the internal experience of emotion is not available for direct observation, signs of emotion can be inferred from nonverbal

behaviors, such as facial expressions. Individual emotion experience, understanding, and regulation can be studied through verbal reports of feelings, interpretation of emotionally charged situations, and measurement of behavioral reaction to affectively charged situations.

More important for the purposes of this study is an understanding of how emotions influence our social interactions. Emotional competence refers to the ability to successfully use, understand, interpret, and regulate emotions (Saarni, 1990). The many aspects of emotional competence can be grouped in terms of emotion expression, emotion appraisal, and emotion regulation. These components interact to influence social competence in general. Also, there are many factors contributing to emotional competence. For example, it is likely that the child's temperament, social context, history, and relationship with their parents influences emotional experience (Casey, 1993).

Children with psychological disorders are rarely included in systematic study of emotional competence. New conceptualizations of childhood psychopathology, however, have begun to include emotion as a central feature. For example, recent definitions of ADHD include problems with self-regulation as one of the disorder's primary deficits (Barkley, 1991; Westby & Cutler, 1994). Because self-regulation involves the control of emotion, especially negative emotions (Thompson, 1991), this newer view of ADHD highlights the possible importance of emotion in the presentation of the disorder.

The current study will evaluate the emotional competence of ADHD children. Two preliminary studies have found a particular pattern of emotional competence deficits in ADHD children. Compared to normal children and children diagnosed with other psychological disorders, ADHD children were the least able to assess their own and other's emotion and expression, were less able to explain how they knew they were experiencing an emotion, were less likely to use contingent emotion expression, and were expressively more positive (Casey, 1991; 1996). This study will attempt to replicate some of these findings, comparing ADHD children to normal children. It will also extend the research, examining the possible nature of emotion regulation deficits in ADHD children, exploring the possibility of differences between the behavior of parents of children with and without ADHD, and considering the relevance of classifying children into groups of normal, mild/moderate ADHD, and severe ADHD.

Eighty children age 6 to 14 and at least one of their parents participated in the study. Forty-four of these children met diagnostic criteria for ADHD and the remaining 36 children did not. Parents completed three measures of their child's psychopathology to identify and measure the severity of the ADHD. Parent and child also participated in a puzzle box assembly game together in order to obtain measures of emotion appraisal and regulation. The emotion measures included in this study provided information on emotion appraisal out of a social context, appraisal of their own and their parent's emotion within a social context, child's

emotional regulation, and parent regulation of the child.

I expected that ADHD children would demonstrate weaknesses in emotion appraisal and emotion regulation. It was hypothesized that they would be less accurate in knowing their own and their parent's feelings and facial expression. It was proposed that children would demonstrate more pronounced emotion appraisal deficits during the experimental social interaction than during appraisal of facial expressions out of the social context. They were also expected to score lower on positivity and joint participation with their mother, and higher on negativity and frequency of rule infractions. The impact of parental regulation during the parent-child interaction was also investigated. ADHD children were expected to have parents who scored lower on frustration management, instruction, positive parenting, and joint participation, and higher on negative parenting and task-interfering behaviors, compared to parents of non-ADHD children.

A second purpose of the current study was to investigate whether emotional competence deficits in children with ADHD would be related to symptom severity. It has yet to be demonstrated that children with a range of severity of ADHD demonstrate similar deficits. This study examined individual differences in emotional competence as a function of the severity of ADHD. There is scant research on the qualitative differences among groups of children diagnosed with ADHD. For example, it is not known whether children who have fewer ADHD symptoms demonstrate similar patterns of emotional competence deficits as those with more ADHD symptoms. Therefore, this

study will explore emotional competence of children with symptoms of ADHD ranging from mild/moderate levels to very severe manifestations of ADHD, as well as a comparison sample of normal children. It is of interest whether an increase in ADHD symptoms corresponds to an increase in emotional competence deficits. It is expected that children with mild/moderate ADHD will show more emotional competence deficits than normal children, but not as severe as in the case of those actually diagnosed with ADHD.

In summary, this study addresses a number of questions: (a) Will there be a significant difference between the ADHD children and nondiagnosed children's emotional skills? (b) Will there be significant differences in behavior between parents of ADHD and non-ADHD children? (c) Will the child's performance on emotional competence tasks, such as emotion appraisal and emotion regulation, be related to the number of ADHD symptoms they manifest?

Chapter Two

Review of Literature

Emotional Competence

A review of the current literature follows, describing emotional competence and its components. Findings regarding emotional competence in both normal and diagnosed children are reviewed. This is followed by specific information regarding ADHD and the dimensional approach to its assessment. The chapter concludes with further elaboration of the current study in light of the current research.

As initially stated in the first chapter, emotional competence is defined as the ability to successfully use, understand, display, and manage emotions (Saarni, 1990). It includes learning the cultural meaning of emotions and is acquired through social relationships. Saarni concludes that "children learn the emotional behaviors, norms, and symbols of their culture as unintended consequences of social interaction" (1990, p. 115).

Emotional competence also includes applying knowledge about emotions purposively. Once children understand the various aspects of emotion, they may actively create their own emotional world by strategically influencing social interactions to attain a desired end. For example, once the skill of expression is attained, a person can use that knowledge to exaggerate or suppress their emotional displays to influence others and to regulate their emotional experience. In this way, emotion is biologically adaptive (Thompson, 1991). Thus, emotional competence is closely

related to the more general concept of social competence and greatly effects the way individuals interact with their environment.

Overall, the many components of emotional competence can be summarized into three general facets: expression, appraisal, and regulation of emotion. Developmentally, these skills evolve gradually. For example, children understand how the factors relate to simpler emotions such as sadness and anger before they understand how they apply to more complex emotions such as jealousy or guilt (Casey, 1991). Usually, an understanding of the principles underlying emotional competence are normally well established by middle childhood (Saarni, 1990).

I will first discuss the three components as they relate to one another and emotional competence in general, then describe the research on each individually.

The three facets of expression, appraisal, and regulation are intertwined. For example, the regulation of an emotion will be effected by its appraisal. Fisher (1980) notes that attaining the skills of emotion expression and appraisal are prerequisites to attaining emotion regulation.

An emotionally competent child is aware of their own and other's emotions, can express emotions appropriately, and can regulate their emotions effectively according to task demands (Casey, 1991). They are able to expressively and receptively understand emotions and demonstrate skill in social situations that evoke emotions. Emotional competence in everyday life is most important in situations that demand good social relations

and adequate management of emotion.

In addition, emotionally competent children are less aggressive and are perceived as being friendlier than children with weaker emotion skills (Denham & Grout, 1993). In general, children who display a variety of emotional expressiveness skills in the middle range of intensity appear better able to relate to feelings and manage their relationships more effectively. Positive affect is important in the origination of social transactions and helps to maintain friendships. On the other hand, negative affect, especially anger, hinders relationships, and both teachers and peers rate preschoolers who display high levels of negative affect as "difficult" (Denham, McKinley, Couchoud, & Holt, 1990). Such children would be considered less emotionally competent.

Thus, deficits in emotional competence are seen most clearly in social interactions. The manner by which a child understands emotions effects their interpretation and response to social transactions (Casey, 1996). For example, consistently misjudging another person's facial expressions may lead to confusion on both the part of the child and their partner. Even subtle initial misinterpretations interrupts the social process and may have large effects in the satisfaction of the interaction.

Children with weaknesses in emotional competence often have strained relationships with peers, parents, and teachers. They cannot modulate their emotions to successfully complete tasks, such as school work. Self-regulation strategies are needed for attention and concentration, especially with tasks

that are not intrinsically interesting or rewarding.

Socialization and culture are primary in the development of emotional competence. The way we are directly and indirectly socialized impacts what constitutes an elicitor of emotion. Also, the direct statements that parents tell their child about emotions, such as "big girls don't cry", and child-rearing practices are also influential. In many respects, emotional competence measures the socialization of emotion.

In addition, as children come to understand emotion expression, they also learn their culture's display rules regarding the appropriateness of displaying an emotion in a certain situation (Saarni, 1990). Culture will also influence the types of regulation desired. For example, in some cultures and subcultures, mothers encourage the development of anger in order to toughen the child so they can handle themselves in rough or violent situations. Although some researchers contend that middle-class parents value and therefore encourage more self-regulation in their children compared to lower-class parents (e.g., Buss & Plomin, 1975), research data does not always support this idea (e.g., Silverman & Ragusa, 1992).

Having discussed emotional competence in general, I will now discuss the three major components separately.

Expression of Emotion

We communicate and express our emotions through facial expressions, posture, gestures, and tone of voice. Some initial expressions are automatic, such as matching another

person's expression (Casey & Schlosser, 1994). Others are more voluntary and manipulated for a particular purpose. Children first learn to coordinate their inner emotional states with their outward expression. They also quickly learn to accept incongruity between inner and outer states. They realize that the outward appearance does not necessarily have to match inner feeling, and that internal feelings do not necessarily have to be expressed outwardly. By the preschool years, children can exaggerate their expressions in order to get attention, as well as minimize them in other situations by substituting another expression for their true expression (Saarni, 1990).

With socialization, children learn display rules and their culture's specific expectations regarding emotional display and expression. Children discover how to assess the social situation, monitoring and modifying their expressions to create the desired impression. However, expressing appropriate behavior involves not only being aware of display rules, but also having the motivation to apply them (Saarni, 1984). It is also important that the child learns that display rules are usually more important in negative situations.

The understanding of display rules increases throughout middle childhood. Ten-year-old's can spontaneously report display rules and give a higher level of reasoning for the use of a display rule, as compared to 6- and 8-year-olds (Saarni, 1979). For example, younger children are more likely to display negative expressive behavior when receiving a

disappointing gift, as compared to older children.

The social context is also important to children's understanding of emotions and emotional expression. Casey (1993) found that in normal children, the positive or negative nature of the social context influenced the expression, self-report, and understanding of emotion. For example, child's accuracy of reported facial expression decreased as their expression became more negative.

Although not a consistent finding, gender differences in the use of display rules have also been found. When receiving mild negative feedback from another child, girls were better able to report their initial facial expression and displayed more emotion than boys (Saarni, 1984). However, the same study did not find gender differences in the understanding of emotion. It was hypothesized that perhaps girls are more aware of social display rules in negative situations or that they feel pressure to appear pleasant even though they are disappointed. It is also possible that boys may have more control over their emotions, be better able to suppress negative emotion, or may not feel the social pressure to display emotions otherwise. This finding of gender differences in the use of display rules is interesting, given the much higher prevalence of externalizing disorders, including ADHD, in males. Since such disorders often involve violation of display rules and inappropriate behavior, this suggests there may be further links between gender and display rules to be explored.

Appraisal of Emotion

Emotion appraisal refers to the ability to assess, correctly identify, and understand facial expressions and the internal states of oneself and one another. It includes recognizing that more than one emotion may be experienced at any particular time and that the causes of emotions vary with the individual.

A prerequisite to assessing one's own emotion is having a sense of self. Although a child may experience emotional reactions beforehand, it is not until children are about one-year-old that they become aware of emotions as their own (Saarni, 1990). By age two, children can usually verbalize basic feelings. Bretherton, Fritz, Zahn-Waxler, and Ridgeway (1986) report that by age three, children often refer to their internal states as they relate to emotion. Three-and four-year-olds usually have a wide range of vocabulary of emotion words. It has also been reported that children as young as three-and-a-half can identify the emotion commonly elicited by a situation (Thompson, 1986).

By middle childhood, children learn to discern other people's emotions. Once this skill is mastered, they can use other's expressive behavior as a model to evaluate their own reactions. By age 6, they can usually accurately identify the facial expressions of the basic emotions (reviewed in Saarni, 1990). Another study documented that during this stage, children can also provide situational determinants for emotions experienced by themselves and others. Strayer (1986) found no differences in the explanations given for the

experience of emotion by oneself and someone else. However, the types of explanations given varied according to the age of the children. Specifically, seven-to eight-year-olds were more likely to use interpersonal and achievement explanations as compared to explanations given by five- to six-year-olds.

Another study found that by age six, children can apply unique personal information to understand another person's emotional experience. Gnepp and Gould (1985) tested five- to ten-year-olds and concluded that the older children realized that a story character's personality traits and past experiences could influence the way the character felt. In this way, children did not simply use the most immediate situation in determining affective response. Harris, Olthoy, and Terwogt (1981) found that younger children are more likely to attribute emotions to behavioral and bodily reactions as they relate to external events. Older children were more likely to include internal mental states in explaining their emotional reactions.

Many studies explore emotional competence by studying children in vicarious situations. However, different results are sometimes found when real social situations were employed. For example, in a study of children in actual social situations, no age differences in the understanding of emotions or in the report of own facial expression were found between younger (middle childhood age) and older (late childhood and preadolescence) children (Casey, 1993). This can be contrasted with other studies that use vicarious situations that have found differences in such skills.

Nonetheless, in both types of studies, older children are still able to explain their emotional reactions on a higher level than younger children.

Emotion Regulation

Emotion regulation refers to the ability to effectively manage and modulate emotion expression and internal emotional experience. It includes "monitoring, evaluating, and modifying emotional reactions" and emotional displays (Thompson, 1991, p. 269). Compliance, response inhibition, delaying gratification, and modulating behaviors without supervision are also involved (Dodge, 1989; Silverman & Ragusa, 1992). Emotion regulation is used most often in times of stress and heightened emotional arousal, such as coping during a separation from the caregiver. It also allows a person to respond flexibly and accommodate to change.

Self-regulation is a major goal of childhood. As an infant, a child regulates themselves by using techniques such as rocking, sucking, and self-distraction (Dodge, 1989). They also influence the amount of emotional regulation they receive from adults by crying. Differences observed in self-control may be attributed to biological predispositions, which influence both temperament and personality style. However, numerous studies have documented that parents/caregivers are also a large contributor to emotion regulation. During the early years of life, caregivers control the amount emotional arousal the child experiences through direct intervention, selective reinforcement, and modeling (Thompson, 1991). In many respects, parental regulation precedes and contributes to

a child's development of self-regulation.

Researchers have also studied how the caregiver's emotional expression regulates the infant. Campos, Campos, and Barrett (1982) argue that a caregiver's facial and vocal expressions convey values to children, which can later develop into emotions such as shame and guilt.

Even so, children intentionally look to their care-givers for regulation. Social referencing, in which children refer to and imitate their caregiver's responses in ambiguous situations, can be seen in 7-month-old children (Feinman, 1982). There are many studies documenting correspondence between maternal and child emotion. For example, Termine & Izard (1988) found that when mothers displayed joy, their infants looked at their mother more and showed more positive emotion. In the same way, when their mothers were sad, the infants looked at their mothers less and displayed more sadness and anger. Similar findings of contingent emotional responding have also been found with preschoolers and children of middle childhood age (Denham & Grout, 1993).

Researchers conclude that if a child is repeatedly exposed to an emotion, they are more likely to display and experience that emotion. It was found that toddlers are more likely to respond with anger and distress when a parent displays anger, such as arguing with another person nearby (Campos, Campos, & Barrett, 1989). Thus, the emotional climate of the family will have far-reaching effects, through emotional contagion even if the child is merely observing and is not the target of the emotion.

Thus, overall, parental temperament is an important contributor to a child's emotional competence. Children of mothers reporting a greater proportion of externalizing emotions interacted less positively with peers, but reacted more appropriately to the peer's display of emotion (Denham & Grout, 1993). It was hypothesized that frequent coping with maternal anger and its resulting guilt may create more understanding and sympathy when others are upset. It is also possible that the child's needs for self-preservation are heightened, and the child becomes aware of cues needed to protect themselves. The same study found that mother's report of a high level of internalizing emotions did not correlate with child behavior, leading the authors to suggest that emotion displays with internalizing disorders may be less pronounced and therefore less influential.

According to attachment theory, the quality of the mother-child relationship and their interactions also contributes to the child's social competence (Ainsworth, Blehar, Waters, & Wall, 1978). Denham, Renwick, and Holt (1992) found support for that theory when they discovered that maternal inability to positively engage with their child was associated with the child having strained and problematic (e.g., nonassertiveness) interactions with peers. In addition, such effects appear to be long-standing and stable. A longitudinal eight-year study examined the relationship between a child's development of empathy and maternal behavior. It was found that a mother's positive communication (e.g., positive expression) was associated with an adolescent's ability to

empathize and take other person's perspective cognitively (Eisenberg & McNally, 1993).

Denham, Renwick, and Holt (1992) studied the interactions between children and mothers performing a task together. They conclude that normal children with deficits in emotional regulation are more likely to have mothers who do not support the child's autonomy, do not set limits to help the child focus on the task at hand, and are more likely to become negative and angry during tasks they do together. For example, maternal task orientation appeared to uniquely prevent children from experiencing sadness later with peers. This suggests that maternal positivity, task orientation, and encouragement of autonomy helps strengthen children's own emotional regulation.

Management of negative emotions, such as anger, frustration, and disappointment is a major target of emotional regulation. In general, parents are more likely to reward self-controlled behaviors than those that are not controlled (Thompson, 1991).

There are a number of strategies that mothers use to regulate their child's emotions, such as ignoring, comforting, distracting, correcting, and matching emotion (Casey & Fuller, 1994). By interviewing both mothers and normal children and assessing their typical responses to hypothetical emotion-eliciting situations, they found that the strategy employed varied with the type of emotion being regulated. For example, mothers reported they would be more likely to match their child's emotion in happy situations, and to use instruction in

a fear situation.

Silverman and Ragusa (1992) found evidence for the stability of emotional regulation throughout a child's early years. A mother's ratings of child impulsivity, attention span, and delayed ability at two-years of age predicted emotional regulation abilities at four years. Campos, Campos, and Barrett (1989) similarly concluded that emotional reactivity is stable throughout infancy and early childhood. Although one would expect that mothers of middle-childhood-age children would use fewer or less directive strategies than the strategies used with preschoolers, this expectation is not supported by empirical research (e.g., Casey & Fuller, 1994). Results from the same study suggest the surprising finding that anger is less likely to elicit emotion-regulating strategies overall at any age.

Problems with Research on Emotions and Emotional Competence

Most of the research done on emotional development and emotional competence has used only normal children. Despite the importance of emotional competence to theories of normal and abnormal child development, little research has been conducted examining the link between emotional competence and childhood psychopathology.

The lack of interest in such issues may be due to the way emotions were conceptualized before the 1980's. In the past, emotions had been thought of as purely internal processes, produced solely by unmeasurable cognitions (Campos, Campos, & Barrett, 1989). More recently, emotions are being defined as "not mere feelings, but rather, processes of establishing,

maintaining, or disrupting the relations between the person and the internal or external environment, when such relations are significant to the individual" (p. 395). In addition, the more recent research includes the adaptive aspects of emotion, their influence on behavior, and their role in attaining goals. Thus, this new definition of emotion captures both its intrapersonal as well as interpersonal aspects.

Research on the social aspects of emotion most often focuses on children's experience of their own emotion. Very little research has explored how well they understand other people's emotions or facial expressions. In addition, most studies use children's report of how they would respond if in a hypothetical situation or involves instructing them to display an expression. Little research has been done with children in real situations or examining spontaneous expression (Saarni, 1984). The current study will attempt to rectify some of these limitations and potential problems.

Preliminary Studies of Emotional Competence in Children with Psychological Disorders

One recently developed theory hypothesizes that children with psychological disorders have unique and specific ways of understanding emotions and behaving emotionally (Casey, 1991; 1996). Specific deficits in emotional competence have been found in children with Attention Deficit Hyperactivity Disorder (ADHD) that differentiates them from normal children, as well as children diagnosed with other forms of psychopathology, including Oppositional-Defiant Disorder (ODD) and Major Depression (MDD). In general, children with

externalizing disorders (ADHD and ODD) perform more similarly on emotional competence tasks than children with internalizing disorders (MDD). Casey (1991; 1996) suggests that the presence of psychopathology may "delay or disrupt" normal, successful emotional development.

Casey (1991; 1996) found that ADHD children demonstrated particular patterns of deficits in all three areas of emotional competence (i.e., expression, appraisal, and regulation) when compared to normal children and children with other forms of psychopathology. In terms of emotional expression, ADHD children showed the most facial expression, in contrast to MDD children who showed little facial display. ADHD children also demonstrated the highest number of changes in facial expression.

ADHD children were also the least able to remember an unfamiliar peer's facial expression and least able to assess their own emotion and expression. Specifically, they tended to rate the other person's facial expression more positively than it actually was. Only 11% were able to correctly identify another person's expression, compared to 73% of MDD children and 55% of normal children (Casey, 1996). In addition, ADHD children were less able to explain how they knew they were experiencing a certain feeling (e.g., knowing they felt happy because they were smiling). Only 11% were able to accurately assess their own emotion, in comparison to 50% of the normal children who were able to appraise their own emotion. Thus, ADHD children did not understand their emotions as well as normal children.

Also, in terms of emotion regulation, during a task completed with an unfamiliar peer that included both a success and a failure, ADHD children showed intense positive emotion, usually in the form of excitement. By comparison, ODD children were more negative in their presentation. ADHD children were also less likely to use contingent expression of emotion and displayed much noncontingent smiling. Overall, in response to emotion contagion, their expressive behavior was more positive, as compared to normal, ODD, and MDD children. In addition, in contrast to children with ODD, ADHD children were more likely to report not having control over their emotional expression.

Thus, overall, ADHD children appear to show a positive bias in their expression and interpretation of emotion. This patten was observed across all three areas of emotional competence.

Given that distinct patterns of emotional competence have been found not only for ADHD children, but also for ODD and MDD children, it is possible that disturbances in emotion may be linked to the presentation of childhood psychopathology.

A chicken-or-the-egg problem exists and the process by which these deficits occur is unclear. We do not know which develops first, the emotional competence deficits or the psychopathology. In other words, does the psychopathology lead to problems with expression and reception of emotion or do the emotional development problems lead to psychopathology? It is likely that an interaction between the two occurs. They may be correlated without one "causing" the other (Casey,

1996).

These data examining the link between emotional competence and ADHD have yet to be replicated. It is an important research question since the characteristic impulsivity of the ADHD child makes initial appraisals and interpretation of social situations even more important. In addition, the original studies from which these ideas were derived were not designed to specifically test the particular hypothesis examining emotional competence in children with psychological disorders. Furthermore, the studies described involved having children interact with unknown children. It is of interest to know if having children interact with a familiar adult may increase emotional competence. For example, a child may be better able to appraise the emotion of another person if they know the person well, such as their mother. The present study undertakes such tasks. However, before describing the current study, I will review the defining features of ADHD and the current research on ADHD and emotion.

ADHD

The next section will provide a description of ADHD, concluding with a discussion of the two major ways of assessing child psychopathology, the categorical and dimensional approaches.

As its name suggests, ADHD is a disorder characterized by inattention, hyperactivity, and impulsivity. According to the most recent diagnostic criteria presented in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American

Psychiatric Association, 1994), the diagnosis is given to children who exhibit six or more symptoms of inattention, such as being easily distracted and having difficulty organizing tasks, or children who display six or more symptoms of hyperactivity and impulsivity, such as often fidgeting, talking excessively, and having difficulty awaiting turns. The diagnostic criteria take into consideration the variability of the child's behavior and how their behavior often changes depending on the situation. For example, even with ADHD children, symptoms usually decrease in new settings, one-on-one interactions, and during activities the child truly enjoys (APA, 1994). Therefore, an overall clinical impression of the inattention and hyperactivity is used. The symptoms also must have been present for at least six months and be impairing the child's functioning. It is only diagnosed if symptoms were present before age seven, are observed in two or more settings, and cannot be better accounted for by another disorder (APA, 1994).

Although estimates vary greatly, approximately 3 to 5 % of school-age children have ADHD (APA, 1994). It is more prevalent in males, with male to female ratios estimated at 4:1 in the general population and 9:1 for clinic populations. There also appears to be a hereditary component to its presentation, with psychopathology, including ADHD, being more common in first-degree relatives of ADHD children, and hereditary estimates for twin studies approximating 50% (reported in Barkley, 1991). Even though it is possible that the individual can make effective adjustment and adaptations,

it is typically a chronic condition (Barkley, 1987).

Newer theories hypothesize that the primary deficit of ADHD is a self-regulating problem (Barkley, 1991; Westby & Cutler, 1994). This is supported by the observation that ADHD children demonstrate problems adhering to rules, complying with parent and teacher requests, and delaying gratification. This new definition helps to more meaningfully capture the social and emotional problems exhibited by ADHD children and corresponds with the focus of the current study.

ADHD is manifested socially with frequent interruptions, not listening to others, initiating conversations at inappropriate times, and inappropriate grabbing of objects. Social problems such as peer rejection and family interaction conflicts are typical in the lives of such children. Even into young adulthood, over 75% of individuals with childhood hyperactivity report interpersonal problems (Thorley, 1984). Impaired social relations are also included as a part of the defining features of the disorder. However, this is usually attributed to impulsivity. Until recently, little research had been undertaken exploring other possible explanations of why the social problems might occur, such as emotional competence. The personality traits and interpersonal problems associated with ADHD suggest that emotion plays a role in the disorder.

Research on Family Interactions of ADHD Children

Research suggests that interactions between children with ADHD and their parents are significantly different than those between normal children and their parents. Silverman and

Ragusa (1992) review that mothers of ADHD children are "more directive and negative, as well as less rewarding and responsive to their children" and that ADHD children are "less compliant and more negative" (p. 417) as compared to normal controls.

As already reviewed, the development of self-regulation in normal children is affected by maternal behavior (Silverman & Ragusa, 1992; Denham, Renwick, Holt, 1991). These researchers also found evidence that children who had more ADHD symptoms and demonstrated low self-regulation were also more likely to have mothers who scored low on warmth, high in negativity, and responded that they felt child-rearing was aggravating. Conversely, children whose mothers encouraged independence were higher in self-regulation and lower for ADHD symptoms. However, this was found only for children at 24 months and did not apply to the same children at 4 years.

Even though mother-child interactions are bi-directional (Bell, 1979), some evidence suggests that at least some of the mother's behavior is a reaction to the child's misbehavior. It has been found that mother-child interactions improve and are less conflicted when children take stimulant medication (Barkley, Karlsson, Pollard, & Murphy, 1985). Convergent evidence that the child's behavior influences mother-child interactions was also found for conduct-disordered children (Anderson, Lytton, & Romney, 1986). However, Silverman and Ragusa (1992) caution that "no conclusions can be drawn from this research about the cause of ADHD. Mothers can cause ADHD behavior and also be reactive to it. Or they can just be

reactive to it" (p. 431). Barkley (1988) contends that the negative behavior displayed by mothers of children with ADHD is a responses to their child's behavior and does not produce the ADHD symptoms. He attributes the severity of the ADHD symptoms as the cause of the negative behavior. Thus, it could be reasoned that the more severe the ADHD, the higher the level of negativity the mothers will exhibit. However, this has yet to be demonstrated empirically.

The Dimensional Approach to ADHD

There are two major approaches to assessing childhood psychopathology, categorical diagnoses and dimensional measurements. As Biederman, et al (1993) described, the categorical approach is medically-based and views pathology as a syndrome with a particular number of symptoms. Individuals are categorized as disordered or non-disordered based on the diagnostic criteria of the DSM-IV (APA, 1994). This approach assumes that people who have and do not have a diagnosis come from relatively homogeneous groups (Fergusson & Horwood, 1995). Structured interviews are often used to obtain the necessary information to complete an assessment using the categorical approach.

Conversely, the dimensional approach (sometimes called the factorial approach) is psychometrically-based and "views psychopathology as a quantitative deviation from normal, rather than a discrete clinical entity" (Biederman, et al, 1993, p. 1242). Rapid screening devices such as checklists (e.g., the Child Behavior Checklist [CBCL]) are examples of ways to complete an assessment applying the dimensional view.

According to the dimensional approach, disorders including ADHD are conceptualized as existing on a continuum with normal child behavior. For a diagnosis to be rendered, the number of symptoms must place the individual at the extreme end of that continuum (Barkley, 1987). This approach assumes that problems range from none to severe. Varying levels of severity are recognized, including cases which come close to, but do not reach, the point of diagnosis. A particular cut-off score is usually recommended, with children scoring above the cut-off point being diagnosed with the disorder and children scoring below the cut-off point not being diagnosed. Barkley (1987) acknowledges that the point that normal is distinguished from abnormal is often arbitrary. When normative data is available, cut-off scores indicate when the presence of the syndrome is statistically deviant (Shekim, et al, 1986). Applying this perspective to ADHD, it assumes that most children display at least some of the ADHD symptoms sometimes, but that for the diagnosis to be given, the behaviors must be significantly above the norm.

Although the dimensional approach is not used as much as the categorical approach, research has supported its utility. Fergusson and Horwood (1995) found that externalizing disorders, such as ADHD and conduct disorder (CD), have dimensional properties with the severity of problems ranging from none to severe. These researchers concluded that a continuous linear relationship exists between symptom severity ("the extent of ADHD symptoms") and outcome risk. Dimensionally scored variables also had better predictive

validity for ADHD, CD, and oppositional-defiant disorder (ODD) compared to measures based on DSM criteria. These investigators report further that those not diagnosed have varying levels of symptom severity and are not a homogeneous group. This suggests that using only DSM criteria may not adequately describe the range of symptoms of those not diagnosed.

The imperfection with the diagnostic criteria provides additional support for the dimensional approach. In describing the DSM-III-R field trials for ADHD, Spitzer, Davies, and Barkley (1990) report that there was a lack of consensus on the Advisory Committee of experts responsible for deciding upon the number of symptoms required for the ADHD diagnosis. They resolved the question empirically, and choose a cut-off score that maximized sensitivity (subjects diagnosed with ADHD who actually have it) and specificity (subjects not diagnosed with ADHD who do not actually have it). Even still, as Spitzer, Davies and Barkley (1990) emphasize, "no completely objective and validated laboratory measure exists for establishing the presence of any of (the) behavioral disorders" (p. 696). Thus, there is no "magic" number that will completely discriminate ADHD from non-ADHD children. Although the cut-off score decided upon is within acceptable statistical standards (.85 sensitivity and .80 specificity), there will still be a certain number of children missed according to such a system. The present study will attempt to incorporate the strengths of each approach in evaluating emotional competence in less severe ADHD and more severe ADHD

children.

One last consideration is that it could be argued that the number of symptoms needed to make a diagnosis should vary with the developmental level of the child. Preschoolers may need a higher number of symptoms to qualify for a diagnosis, while adolescents might require a lower number (Spitzer, Davies, & Barkley, 1990). Given the ages that the field trials used, the cut-off score appears most appropriate for children ages 6 to 12. When researched, it was concluded that only "very weak support for guidelines suggesting that mental age should somehow be considered in assessing behavioral ratings when a judgment is made about severity of hyperactivity in children" (Pearson & Aman, 1994, p. 395). Therefore, the developmental level of the children will not investigated in this study.

Research Regarding the Levels of Severity of ADHD

The issue of level of severity is clinically relevant. When elementary school teachers were asked about "barriers to instruction of ADHD children", severity of problems was one of the four most consistently rated aspects (Reid, Vasa, Maag, & Wright, 1994). Similarly, Anastopoulos, Guevremont, Shelton, and DuPaul (1992) found that severity of ADHD symptoms was a significant factor in predicting parenting stress.

Although not routinely researched, there is some data regarding the variables often associated with more-severe ADHD. For example, early onset of ADHD symptoms is associated with more severe outcomes (as reported in Cole, Zahn-Waxler, & Smith, 1994). In addition, Barkley (1991) states that

environmental factors appear to play a role in determining the severity of the ADHD symptoms.

There has only been minimal research exploring the relationship between the severity of ADHD and emotional competence. Nonetheless, one study found that the use of display rules varied depending on the level of risk children had for developing disruptive behavior disorders (Cole, Zahn-Waxler, & Smith, 1994). When in a disappointing situation, at-risk boys displayed less spontaneous emotional control for longer amounts of time when a stranger who disappointed them was present, compared to low risk boys. At-risk boys also displayed more anger than low-risk boys. Thus, the at-risk boys demonstrated less emotional competence. The same study discovered that low-risk girls showed more negative emotion than high-risk girls when alone compared to when the experimenter was present. Such studies illustrate the need for further research into the possible link between severity of ADHD and emotional competence.

In terms of outcome, follow-up studies indicate that subclinical cases of ADHD more closely match normal controls than those previously diagnosed with ADHD. For example, Mannuzza, et al (1988) found that subclinical ADHD individuals did not differ from normals in terms of occupational adjustment, temperament, and alcohol use. This lends support for the categorical model of diagnosis because the diagnosis accounted for much of the variance between the groups. However, this study did not specifically tap the quality of social relationships and the empirical question exists whether

subclinical ADHD children more closely match ADHD children in terms of emotional competence.

The Current Study

After reviewing the scientific literature, numerous questions remained regarding the emotional competence in children with psychological disorders and whether aspects such as symptom severity and parental contribution may be important in the presentation in disorders such as ADHD. The theoretical emphases drawn from the literature influenced the kinds of situations and methods employed in this study. As this review has already stated, emotional competence is embedded in social relationships; therefore, this study used the parent-child relationship to examine emotion use and understanding.

Even though expression is often suppressed when another person is present (Yarczower & Daruns, 1982), previous preliminary studies have found emotional competence deficits for ADHD children when they interacted with an unfamiliar peer. However, one component of emotional competence is considering unique personal information about a person to understand their emotional state (Saarni, 1990). Therefore, the current study examined emotional competence in children interacting with a familiar adult. The empirical question remains as to whether children will demonstrate more emotional competence when interacting with their parent, as opposed to an unfamiliar peer.

In addition, the current study also included the additional task of having the children choose which facial

expression most closely matched their verbal response from pictures of the five basic emotions. It was of interest whether this specific emotion skill differed between ADHD and non-ADHD children, as well as between children with differing levels of ADHD.

Differences between parents of ADHD and non-ADHD children were also investigated. Although there is less support that these variables would uniquely predict emotional regulation (Denham, Renwick, & Holt, 1992), both the child's and parent's compliance with directions, amount of negativity and positivity, and joint participation were explored.

The actual social experience used in the experiment was designed to elicit emotion and was similar to situations commonly encountered by children. Children's understanding of emotion was studied in a context of "hot cognition" rather than a less emotion-arousing vicarious situation (Casey, 1993). The task they completed entailed having the child and parent complete a puzzle game together, during which the parent coached his or her child to complete a puzzle that only the parent could see and the child could only feel the puzzle pieces (see Method section for a more detailed description of the puzzle). The puzzle also required the parent and child to balance task-oriented demands, the child's autonomy, the child's dependency, and the affect inherent in the task (Denham, Renwick, & Holt, 1991). In addition, Dodge (1989) identifies the study of the regulation of positive emotions as a needed area of research. Therefore, this study included both positive (a success) and negative (a failure) elicitors

of emotion.

To determine if differences in emotional competence existed between children with varying levels of severity of ADHD, each of the factors in the study was evaluated two different ways. First, data were analyzed to determine if there were differences between ADHD versus non-ADHD children. Then, the data were analyzed a second time to determine if there were differences between children with a normal/nonpathological number of ADHD symptoms, mild/moderate levels of ADHD, or severe/highest levels of ADHD.

Chapter 3

Method

Subjects

The sample consisted of eighty children (54 males and 26 females) and at least one parent of each child. The children ranged in age from 6.5 to 14.83 years (M = 10.25, SD = 2.37). Forty-four of these children were given the diagnosis for ADHD based on the criteria set forth in the DSM-IV (APA, 1994). The remaining 36 children did not meet diagnostic criteria for ADHD and served as a comparison group. Demographic characteristics of the sample are presented in Table 1.

Insert Table 1 about here

To investigate potential differences in emotional competence across different levels of ADHD, the entire sample (N = 80) was also subdivided into three groups based on the number of ADHD symptoms endorsed during the Children's Schedule for Affective Disorders and Schizophrenia (K-SADS; Orvaschel & Puig-Antich, 1987) interview. This was done by examining the distribution of the data (e.g., no children were assessed as having five ADHD symptoms) and by attempting to have three groups relatively close in number. This resulted in the following three groups: normal (none to five ADHD symptoms, n = 28), subclinical to moderate ADHD (six to 10 ADHD symptoms, n = 22), and severe ADHD (eleven to fourteen ADHD symptoms, n = 30). The frequency distribution of K-SADS

ADHD scores is presented in Figure 1 and the demographic characteristics of the three groups of varying ADHD levels are presented in Table 2.

Insert Figure 1 and Table 2 about here

Children with ADHD were recruited first from support groups for parents of ADHD children and from newspaper, hospital, and clinic advertisements. During their participation, each parent was asked for the names of five friends of their children who also might be interested in participating in the study. The parents of those children were contacted and invited to participate. The remaining comparison children were located through advertisements.

Measures

Child psychopathology. Parents completed three instruments in order to identify and measure the severity of psychopathology in the children.

Parents were interviewed using the K-SADS, modified to fit DSM-IV criteria, for confirming or ruling out a diagnosis of ADHD. Within the ADHD diagnostic group, the number of ADHD symptoms endorsed on the K-SADS was used to classify children into groups of normal, mild/moderate ADHD, and severe ADHD.

To minimize family-wise error due to the high number of significance tests to be conducted, the Bonferroni correction was employed for these preliminary analyses (new significance level = .05/8 = .006). The number of ADHD symptoms was significantly greater for the ADHD group than for the non-ADHD

group, two-tailed t (1,78) = 3.46, $p < .001$. Analysis of variance (ANOVA) and Tukey post-hoc analyses also indicated that the number of ADHD symptoms as measured by the K-SADS was significantly different between the three level of ADHD groups (normal, mild/moderate, severe), F (2,77) = 5.46, $p < .05$, although this significant finding does not hold when the Bonferroni correction is employed. These results are presented in Tables 1 and 2.

Parents also completed the Child Behavior Checklist (CBCL; Achenbach, 1991) and the Conners Parent Rating Scale (Conners, 1990). The CBCL is a widely used and well-validated measure designed to screen for childhood behavior problems. It contains scales for examining specific broad and narrow-band types of psychopathology in children. The Conners scale is another widely used measure designed to assess the impulsivity, restlessness, and hyperactivity of ADHD children.

To further confirm the differences between the ADHD and non-ADHD groups, three separate two-tailed t-tests were conducted and revealed that, compared to the non-ADHD group, the ADHD group had more ADHD symptoms as measured by the CBCL, t (1,78) = 11.58, $p < .001$, higher impulsivity scores and higher restlessness scores according to the Conners Rating Scale, t (1,78) = 12.42, $p < .001$ and t (1,78) = 10.21, $p < .001$, respectively. For the three levels of ADHD groups, separate ANOVA and Tukey post-hoc analyses indicated significant differences between the three groups on the number of ADHD symptoms as measured by the CBCL Attention Problems subscale, F (2,77) = 56.39, $p < .001$, Conners Impulsivity

scale, F (2,77) = 65.12, $p < .001$, and Conners Restlessness scale, F (2,77) = 50.91, $p < .001$. These results are presented in Tables 1 and 2.

Medication. Parents were asked to report children's medication use. Thirty-one of the forty-four ADHD children and none of the comparison children were taking stimulant medication. One comparison child was taking Tofranil. For the three ADHD groups, none of the normal children, nine of the mild/moderate ADHD children, and twenty-two of the severe ADHD children were taking Ritalin.

Emotion Measures

Emotion appraisal out of context. Children were shown 14 prototypical pictures of facial expressions, 5 of which show expressions of pure emotion (joy, sadness, anger, fear, and surprise) and 9 which show common blends of those emotions, such as anger/sadness and surprise/fear. These pictures were based on prototypes developed by Paul Ekman. The accuracy of children's verbal labeling of each item was assessed and scored as follows: 0 if they could not identify any emotion, 1 if they labeled the expression but missed both the valence and the specific emotion, 2 if they responded with the correct emotional valence but not the specific emotion, and 3 if they correctly identified the specific emotion.

Emotion measures taken within a social context: Puzzle box assembly game. A laboratory-based parent-child interaction was used as the vehicle for obtaining several measures of emotional competence within a social context. (See Appendix A for a detailed description of the puzzle and

the directions.) Each parent-child dyad completed three puzzles together, in a manner designed to elicit emotional responses in the child. The first puzzle was very easy, the second puzzle was designed to frustrate the child by being unsolvable, and the third puzzle was very easy. In each case, the game involved complementary roles of coach (the parent) and player (the child). Measures derived from this interaction included accuracy of children's appraisal of their own and their parent's emotion, children's ability to regulate their behavior, and parent management of children's emotional behavior. Observations were coded live, behind a one-way glass. These observers did not interview the child, were blind to the child's diagnosis, and were trained using the observation coding system.

Child's appraisal of own emotion. Children were asked how they felt (1) at the end of the second (frustrating) puzzle assembly game, and (2) at the end of the third (success) puzzle. (See Appendix B for post-game interview.) Their self reports were compared to the observer's rating of the child's emotion following the second and third puzzle assembly games. (See Appendix C for coding sheet.) The accuracy of children's response was assessed and scored as follows: 0 if they could not identify any emotion, 1 if they labeled the emotion but missed both the valence and the specific emotion, 2 if they responded with the correct emotional valence but not the specific emotion, and 3 if they correctly identified the specific emotion.

Child's ability to match verbal response of own emotion with emotion expression. Children were also asked to choose which facial expression most closely matched their verbal response of their emotion from pictures of the five basic emotions. The accuracy of children's response was assessed and scored as follows: 0 if they could not choose any expression, 1 if they chose an expression but it did not match either the valence or the specific emotion, 2 if they chose an expression of the correct emotional valence of their stated emotion but it did not match the specific emotion, and 3 if they correctly matched the expression with their specific emotion.

Child's appraisal of parent's emotion. Children were also asked how their parent felt at the completion of the second and third puzzle assembly games. The accuracy of their judgment was again compared to the trained observer's judgment of parent emotion. The same scoring system used for appraisal of child's emotion was used (see above).

Child's ability to match verbal response of parent's emotion with emotion expression. Children were also asked to choose which facial expression most closely matched their verbal response of their parent's emotion from pictures of the five basic emotions. The accuracy of children's response was assessed and scored according to the same scoring system used for child's ability to match their own expression (see above).

Child's emotion regulation. Child behavior during the puzzle box game was coded to determine quality of behavior (productive, disregulating, or withdrawn), and frequency of

rule infractions. Observers also coded degree of negativity, degree of positivity, and joint participation (i.e., the positive or negative response to doing a task with the parent) on a Likert-type rating scale of 1 to 5 (see Appendix C).

Parent regulation of child. Parental regulation of the child was coded for the same behaviors as stated above for the child. In addition, frustration management of the child (i.e., the attempt of the parent to help the child deal with frustration), and instruction given to the child (i.e., the quantity and quality of the guidance) was also assessed on a Likert-type rating scale of 1 to 5 (see Appendix C).

Reliability of Emotion Measures. To confirm the reliability of the observations, a second observer coded 25% of the observations for the puzzle box game. Reliability was calculated via intraclass correlations or coefficient kappa, according to the appropriate scale of measurement. Pearson product-moment correlations revealed good agreement for emotion regulation variables (r = .86 overall). Coefficient kappas for the emotion appraisal variables were acceptable (k = .70 overall).

Child Cognitive Functioning. Each child completed the Peabody Picture Vocabulary Test-Revised (PPVT-R; Dunn & Dunn, 1981), a widely-used, well-validated, and brief measure of receptive verbal ability and general cognitive functioning. To investigate whether there were cognitive differences between the ADHD and non-ADHD groups as measured by the PPVT, a two-tailed t-test was performed. There was not a significant difference between the groups, t (1,78) = .95, p

= .34. ANOVA revealed the same lack of difference among the three ADHD groups, F (2,77) = .54, p = .58 (see Tables 1 and 2). To further explore the possibility of this relationship, Pearson product-moment correlation was used to determine whether cognitive functioning as measured by the PPVT-R was related to the emotion appraisal and regulation variables. This analysis indicated that the PPVT-R scores were unrelated to the variables explored in this study (see Table

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Insert Table 3 about here

Parental Psychopathology. Parents completed the Symptom Checklist 90-Revised (SCL-90-R; Derogatis, 1983), a widely used measure of psychiatric problems for adult outpatient populations. This 90-item self-report measure assesses a wide range of psychopathology was included in order to account for possible contributions of parental psychopathology to the children's emotional competence.

To investigate whether there were differences in parent psychopathology between the ADHD and non-ADHD groups as measured by the total psychopathology score on the SCL-90, a two-tailed t-test was performed. Although it indicated a trend in the samples, there were no significant differences between the groups, t (1,70) = 1.77, p = .08. ANOVA also revealed no significant differences between the level of ADHD groups, F (2,69) = .71, p = .50 (see Tables 1 and 2). To further investigate the observed trend, Pearson product-moment correlation was used to determine whether parental

psychopathology was related to the emotion appraisal and regulation variables. This analysis was conducted twice, once examining for ADHD children and repeated for children without ADHD. These analyses indicated that parental psychopathology was largely unrelated to the variables explored in this study (see Tables 4 and 5).

Insert Tables 4 and 5 about here

Procedure

Three experimenters were involved in conducting this study. Two worked with the family and the third experimenter was a trained observer who was blind to the child's diagnosis. All subjects who agreed to participate in the study were provided with a brief description of the study and informed consent (or assent for children) was obtained (see Appendix D).

First, parents were interviewed with the K-SADS by a graduate student or clinical psychologist experienced in diagnostic interviewing. The child completed the PPVT-R and the acontextual emotion identification task with the other experimenter in a separate room. Then, parent and child together completed the puzzle assembly game, during which the trained observer, stationed behind a one-way mirror, rated the child's mood and behavior and the parent's mood and emotion regulation strategies. The child was then interviewed separately after the puzzle game. Parents also completed the CBCL, Conners Rating Scale, and the SCL-90-R. Upon completion

of the tasks, each parent and child was debriefed. Parents were paid ($15.00) and children received a small gift for participating in the study.

Hypotheses:

Hypothesis I: Children with ADHD will demonstrate lower emotional competence compared to normal children.

Specifically, children with ADHD will be less able than non-ADHD children to correctly (1) identify the emotions of the prototypic faces (2) identify the emotions that they or their parent displayed during the puzzle box assembly game and (3) match the emotions that they or their parent displayed to pictures of prototypical facial expressions. It is expected that ADHD children will demonstrate these deficits more in the "hot" situation of the puzzle box game than in the "cold" condition of rating the prototypic faces (Casey, 1993).

In addition, it is also anticipated that the ADHD children will show less emotion regulation than the nonclinical children. Specifically, ADHD subjects will show more rule infractions, disruptive behavior, higher degrees of negativity, lower degrees of positivity, and less joint participation.

Finally, it is also expected that ADHD children will have parents who score lower on frustration management, instruction, positive parenting, and joint participation, and higher on negativity and task-interfering behaviors, compared to parents of non-ADHD children.

Hypothesis II: The level of emotional competence deficits will correspond to the severity of ADHD.

It is expected that children with both mild/moderate and severe ADHD will have problems appraising and regulating emotion; however, it is anticipated that children with more severe ADHD will demonstrate the most severe deficits, and that those with more moderate levels will show less pronounced deficits.

Chapter 4

Results

Effect of child's age The relationship of age to the emotion appraisal and regulation factors was investigated using Pearson product-moment correlations (see Table 6). These analyses indicated that age was related to many of the variables to be explored. Therefore, age was used as a covariate in many of the following analyses.

Insert Table 6 about here

De-contextual emotion appraisal

A one-way ANOVA using ADHD as the grouping variable was used to investigate whether the ADHD and non-ADHD groups differed in their ability to assess the 14 prototypical facial expression pictures. Age was used as a covariate. It indicated no significant differences between the two groups, F (1,72) = .04, p = .84, M = 27.20 for ADHD children, M = 27.09 for non-ADHD children. A between-subjects ANOVA with age as a covariate was also performed with scores on assessing the 14 prototypical faces as the dependent variable and the three levels of ADHD groups as the grouping variable. There were no significant differences between the three groups, F (2,71) = .28, p = .76, M = 26.92 for normal children, M = 27.77 for mild/moderate ADHD children, and M = 26.85 for severe ADHD children.

Emotional competence within a social context

Child appraisal of emotion

To investigate children's ability to assess their own and their parent's emotion, a mixed design MANCOVA analysis was conducted with ADHD status as the between-subjects factor (ADHD vs. non-ADHD) and time (second vs. third puzzle box) and type of emotion appraisal (own vs. parent's emotion) as the within-subjects factors. Age was used as a covariate. The analysis indicated significant main effects of time, F (1,76) = 8.59, p = .004, M = 4.03 for second puzzle box, M = 5.31 for third puzzle box, and a significant time X ADHD status interaction, F (1,76) = 12.47, p = .001. Age was also shown to be a significant covariate, F (1,76) = 9.38, p = .003. In essence, the main effect of time reflected better performance of emotion appraisal for the third puzzle box (positive-emotion condition) than for the second puzzle box (negative-emotion condition). However, Simple Effects analyses indicated that the time X ADHD interaction was caused by a marginally significant difference between ADHD and non-ADHD groups for the second puzzle box, F (1,76) = 3.74, $p < .07$, M = 2.15 for ADHD children and M = 1.847 for non-ADHD children, but not for the third puzzle box, F (1,76) = 1.99, $p > .05$. Tables 7 and 8 present the mean and standard deviation as well as the values of the F statistic and significance levels for each of the variables.

Insert Tables 7 and 8 about here

The same pattern of results was observed for the three level of ADHD groups. To investigate children's ability to assess their own and their parent's emotion as a function of the three ADHD level groups, a second mixed design MANCOVA analysis was conducted with ADHD status as the between-subjects factor (normal, mild/moderate ADHD, or severe ADHD) and time (second vs. third puzzle box) and type of emotion appraisal (own vs. parent's emotion) as the within-subjects factors. Age was again used as a covariate. The analysis indicated significant main effects of time, F (2,75) = 8.90, p = .004, M = 2.02 for second puzzle box, M = 2.66 for third puzzle box, and a significant time X ADHD status interaction, F (2,75) = 6.51, p = .002. Age was also shown to be a significant covariate, F (2,75) = 9.5, p = .003. As seen with the previous analysis, the main effect of time reflected better performance for the third puzzle box (positive-emotion condition) than for the second puzzle box (negative-emotion condition) for all children. However, the significant time X ADHD status interaction indicated that performance improved as the level of ADHD symptoms increased for the second puzzle box, but that for the third puzzle box, performance declined as the level of ADHD symptoms increased. Even so, Simple Effects analyses indicated that performance of the three groups were not significantly different from one another for either the second puzzle box F (2,76) = 1.95, $p > .05$, or the third puzzle box F (2,76) = 1.09, $p > .05$. Tables 9 and 10 present the mean the standard deviation as well as the value of the F statistic and significance level for each of these

variables.

Insert Tables 9 and 10 about here

Child's ability to match verbal response of emotion with emotion expression To investigate children's ability to match their verbal response of both their own and their parent's emotion with pictures of facial expressions, a mixed design MANCOVA analysis was conducted with ADHD status as the between-subjects factor (ADHD vs. non-ADHD) and time (second vs. third puzzle box) and type of emotion appraisal (own vs. parent's emotion) as the within-subjects factors. Age was again used as a covariate. This analysis indicated a significant main effect of type of appraisal, F (1,76) = 6.99, p = .01, which reflected the children's greater ability to match the facial expressions of their parent's emotion compared to their ability to match their own. This main effect was modified by three significant interactions of time X ADHD status F (1,76) = 7.34, p = .008, appraisal X ADHD status F (1,76) = 4.94, p = .03, and time X appraisal F (1,76) = 4.15, p = .05. Age was also shown to a significant covariate, F = (1,76) = 7.80, p = .007. The significant appraisal X ADHD interaction indicated that ADHD status served as a mediator on some conditions and not others. Simple Effects comparisons revealed that children with ADHD performed marginally better than non-ADHD children at the task of matching their own emotion and expression F (1,76) = 3.65, p

< .07, although the two groups were equivalent in their ability to match their parent's emotion and expression F (1,76) = .008, p > .05. Additional Simple Effects comparisons for the time X ADHD status interaction revealed that ADHD children performed significantly better than non-ADHD children overall on the matching task for the second puzzle box F (1,76) = 4.96, $p \leq .05$, but that there were no significant differences between the ADHD and non-ADHD groups for the third puzzle box F (1,76) = .5, p > .05. The time X appraisal interaction also showed that for the second puzzle box, overall the children were better able to match their parent's expression in comparison to their ability to match their own F (1,76) = 9.55, $p \leq .01$, but that there were no significant differences between the children's ability to match their parent's and their own expression for the third puzzle box F (1,76) = 1.35, p > .05. Tables 11, 12, and 13 present the mean and standard deviation as well as the values of the F statistic and significance levels for each of these variables.

Insert Tables 11, 12, and 13 about here

A similar pattern of results were found when level of ADHD symptoms was taken into consideration. To investigate child's ability to match their verbal response of both their own and their parent's emotion with pictures of facial expressions as a function of the three ADHD level groups, another mixed design MANCOVA analysis was conducted with ADHD status as the between-subjects factor (normal, mild/moderate

ADHD, or severe ADHD) and time (second vs. third puzzle box) and type of emotion appraisal (own vs. parent's emotion) the within-subjects factors. Age was again used as a covariate. This analysis indicated significant main effects of type of appraisal, F (2,75) = 7.17, p = .009 and a significant interaction of time X ADHD status F (2,75) = 5.49, p = .006. Two interactions approached significance: time X appraisal F (2,75) = 3.81, p = .06, and appraisal X ADHD status F (2,75) = 2.47, p = .09. Age was also shown to a significant covariate, F = (2,75) = 7.28, p = .009. As seen with the previous analyses, the significant main effect of type of appraisal again indicated the children's greater ability to match the emotion and facial expression of their parent in comparison to their ability to complete that task as applied to themselves. Simple Effects comparisons and Tukey post-hoc tests revealed that the time X ADHD status interaction was caused by a significant difference between the normal and severe ADHD groups for the second puzzle box F (2,75) = 3.73, $p \leq .05$, M = 1.82 for the normal children, M = 2.42 for severe ADHD children, (with neither of the groups being significantly different from the moderate ADHD group, M = 2.05), and none of the groups being significantly different from one another for the third puzzle box, F (2,75) = 1.33, $p > .05$. Tables 14 and 15 present the mean and standard deviation as well as the values of the F statistic and significance levels for each of these variables.

Insert Tables 14 and 15 about here

Child's emotion regulation To investigate whether there were significant differences in the children's emotion regulation factors based on ADHD status (ADHD or non-ADHD), univariate ANOVA analyses were conducted. Separate analyses regarding level of ADHD symptoms (non-ADHD, mild/moderate ADHD, or severe ADHD) were also conducted. Age was used as a covariate. Tables 16 and 17 present the values of the F statistic and significant levels.

Insert Tables 16 and 17 about here

An ANOVA revealed a significant difference between ADHD and non-ADHD groups on degree of child's negativity for the third (success) puzzle box, F [1,74] = 6.12, p = .02, with ADHD children showing greater amounts of negativity than non-ADHD children, M = 1.70 for ADHD children, M = 1.26 for non-ADHD children. An one-way ANOVA conducted on degree of child's negativity for the third puzzle box on the three ADHD level groups also was also significant, F [2,76] = 3.43, p = .04, with the mild/moderate ADHD level group demonstrating the highest level of negativity (M = 1.2 for normal children, M = 1.77 for mild/moderate ADHD children, and M = 1.6 for severe ADHD children). No significant differences were found between the groups on any other of the child variables.

Parent regulation of child To investigate whether there were significant differences in the parent's emotion regulation factors based on ADHD status (ADHD vs. non-ADHD) univariate ANOVA analyses were conducted. Age and parental psychopathology were used as covariates. There were no significant differences between the ADHD and non-ADHD groups for any of the parent factors. Separate analyses regarding level of ADHD symptoms (normal, mild/moderate ADHD, or severe ADHD) were also conducted with age and parental psychopathology as covariates. Two of these ANOVAs were significant: degree of parental joint participation for the third puzzle box, F [2,67] = 3.07, p = .05, with the mild/moderate ADHD level group demonstrating the lowest level of joint participation (M = 3.54 for normal children, M = 3.09 for mild/moderate ADHD children, and M = 3.20 for severe ADHD children), and degree of positive parenting also for the third puzzle box, F [2,67] = 4.19, p = .02, with the mild/moderate ADHD level group again demonstrating the lowest level of positive parenting (M = 3.0 for normal children, M = 2.68 for mild/moderate ADHD children, and M = 2.73 for severe ADHD children). No significant differences were found between the groups on any other of the variables. Tables 18 and 19 present the values of the F statistic and significant levels.

Insert Tables 18 and 19 about here

Relationship between the child and parent emotion

regulation variables Although not originally proposed since it does not relate directly to ADHD, the relationship of child emotion regulation factors to parent emotion regulation factors was also investigated using Pearson product-moment correlations (see Tables 20 and 21). These analyses revealed that a number of parent and child variables were related. There was an association between the parent's instruction, joint-participation, and positive parenting, and the child's joint-participation for both puzzles. Interestingly, the parent's frustration management was related to the child's joint-participation on the third (success) puzzle, but not the second (frustrating) puzzle. In addition, there was also an association between negative parenting and the child's negativity, as well as positive parenting and child's positivity.

Insert Tables 20 and 21 about here

Tables 22 and 23 show the effects of partialling out ADHD-symptom quantity and tables 24 and 25 show the effect of controlling for parental psychopathology on these emotion regulation variables. Overall, consistent with previous analyses, controlling for ADHD-symptom quantity and parental psychopathology had little effect on the results except to increase the already significant levels for many of the variables.

Insert Tables 22 through 25 about here

Chapter 5

Discussion

The results of the current study indicate that the relationship between ADHD and emotional competence is more complicated than originally hypothesized. Many of the findings were actually in the opposite direction than what had been originally proposed.

Emotion Appraisal The results indicate that in disappointing and frustrating social situations, ADHD children are better able to assess emotion in comparison to non-ADHD children. It was also discovered that the ability to appraise emotion in negative social situations improved as the level of ADHD symptoms increased, but in positive social situations this ability declined as the level of ADHD increased.

Also contrary to the original hypotheses was the finding that ADHD children were better able than non-ADHD children in their ability to match their own emotion with its pictorial representation for the negative emotion condition. It was also found that children with the highest level of ADHD symptoms performed best on this task.

Emotion Regulation. Consistent with the original hypotheses, it was found that ADHD children displayed higher levels of negativity and frustration than non-ADHD children in a positive social situation. This is particularly interesting given that the two groups did not differ in their level of negativity in the frustrating and disappointing condition. However, the unexpected result that children with mild/moderate level of ADHD symptoms showed the highest levels

of negativity in the social situation was also found.

None of the other child emotion regulation variables were related to ADHD status. Analyses revealed that ADHD children did not have more rule infractions, more disruptive behavior, lower degrees of positivity, or less joint participation compared to non-ADHD children. Thus, ADHD children can be expected to behave similarly to non-ADHD children on such factors, regardless of whether the context is positive or negative.

In addition, parents of ADHD children and non-ADHD children did not differ in terms of task-interfering behaviors, frustration management, instruction, joint participation, negative parenting, or positive parenting. However, when level of ADHD symptomatology was taken into consideration, differences were found between the groups, with parents of children with mild/moderate ADHD displaying the lowest level of joint-participation and positive parenting in a positive social situation.

Possible reasons why hypotheses were not supported.

The better emotion appraisal skills of ADHD children in negative social situations was a surprising result. It was anticipated that emotional competence for ADHD children would be lower in all conditions. However, it was only for the disappointing and frustrating puzzle box game that ADHD children showed better appraisal skills. If it can be assumed that ADHD children have had more heavily strained social relationships as a result of their ADHD symptomatology, one possible reason for these findings is that perhaps ADHD

children's greater experience with negative social situations have strengthen this particular ability.

Another possible explanation is that the ADHD children may have been more willing to admit they actually experienced a negative emotional response or negative facial expression after the frustrating unsolvable puzzle game. It is possible that the normal children were more attuned to the social norms of inhibiting and denying disappointing affect than the non-ADHD children. Other possibilities include that the use of stimulant medication and the novelty of the task used in this study suppressed the influence of ADHD or that identifying emotion in a negative social situation incorporates different skills or mechanisms than those utilized in positive contexts.

These results do not support the findings of Casey (1991, 1996). However, there were important differences between the studies. Although in the previous study children participated with unfamiliar peers, in this study children interacted with a familiar adult. It is possible that the children were able to incorporate the unique personal information they have regarding their parent to enhance their emotional competence at this task.

Also surprising were the results that the mild/moderate ADHD group, as opposed to the severe ADHD group as anticipated, showed the highest degree of child and parental emotion regulation deficits. It is possible that the severe ADHD children, due to their high level of symptoms, receive more attentive parenting.

Regardless of the validity of the numerous possible

hypotheses that could be used to explain the findings of this study, the results suggest that in negative social situations, ADHD children will be better able to identify and then verbalize the emotional responses. This could have far-reaching implications for their social interactions with others. For example, if their awareness to the social norms that apply in frustrating contexts is actually less mature than those of normal children, they may be more likely to reveal information that may be hurtful to another person (e.g., receiving a disappointing gift). This could potentially result in impaired relationships if ADHD children are not able to relate to others in disappointing situations in the expected manner.

The present study also provides additional support for the contention that emotions are best studied within "real", live, or actual social situations as opposed to simply assessing such skills out of context. The significant differences found between ADHD and non-ADHD children were found only in the "hot" puzzle box situation that was designed to be similar to actual situations children typically encounter. It is likely that more subtle differences between the groups cannot be fully assessed in the "cold" or acontextual conditions.

The Usefulness of Including Level of Severity of ADHD Symptoms. The results of the present study indicate that including the level of severity of ADHD complicates interpretation. For example, in many cases the mild/moderate ADHD group (as opposed to the severe ADHD group) showed the

highest degree of emotional competence deficits. In addition, the results by severity of ADHD usually mirrored those found between the ADHD and non-ADHD groups. Even so, for some variables (e.g., parent emotion regulation factors) separating the groups into categories of normal, mild/moderate ADHD, and severe ADHD indicated subtle differences between the groups that were not detected by simply examining ADHD vs. non-ADHD children. This suggests that, overall, including the level of severity of ADHD symptoms may not add much additional explanatory or useful information, but occasionally can provide some additional insight. Also, the expected trend that the groups would be significantly different from the mild/moderate ADHD group was not found, suggesting that the consideration of the three groups may not be necessary. Although it is possible that subtle differences in emotional competence exist between children with varying levels of ADHD symptoms, it may not be to a meaningful extent. Given the above considerations, at this point it is unclear how useful it is to include level of severity of ADHD.

However, another possibility is that the procedures employed in this study may not have been able to adequately assess severity of ADHD symptoms. For this study, severity was conceptualized as number of ADHD symptoms. An alternative method of grouping would be to classify the number of ADHD symptoms according to type of symptom (e.g., does the symptom refer to a child's inattention, hyperactivity, or impulsivity). According to this method, severity would be defined as number of different types of ADHD symptoms. This

may have better tapped differences between normal children and children whose ADHD is more severe because they have a variety of ADHD symptoms.

Future Research Overall, this study suggests several possibilities for future research. This relatively new area of studying the emotion skills of children with psychological disorders is relevant and potentially clinically useful in terms of treatment. The present study suggests that emotion skills may differ according to the positive or negative aspects of a social situation. Since much of the previous research focuses on appraisal in negative social contexts, potential differences between different types of social situations may prove fruitful. It would also be interesting to explore such issues as they relate to other psychological diagnoses, such as Major Depressive Disorder or Oppositional Defiant Disorder. Further investigation into the different types of emotion skills utilized for unfamiliar versus familiar people, as well as children appraising the emotions of children versus adults are other areas for future study. In addition, questions also remain about the relationship between the child and parent emotion regulation variables.

Concluding Remarks. This study was a useful starting point for future research. Continuing research into this area can increase the awareness of clinicians and researchers of the clinical relevance of emotions and emotional competence in the presentation of some mental illnesses. Given the potential gains in terms of understanding psychological

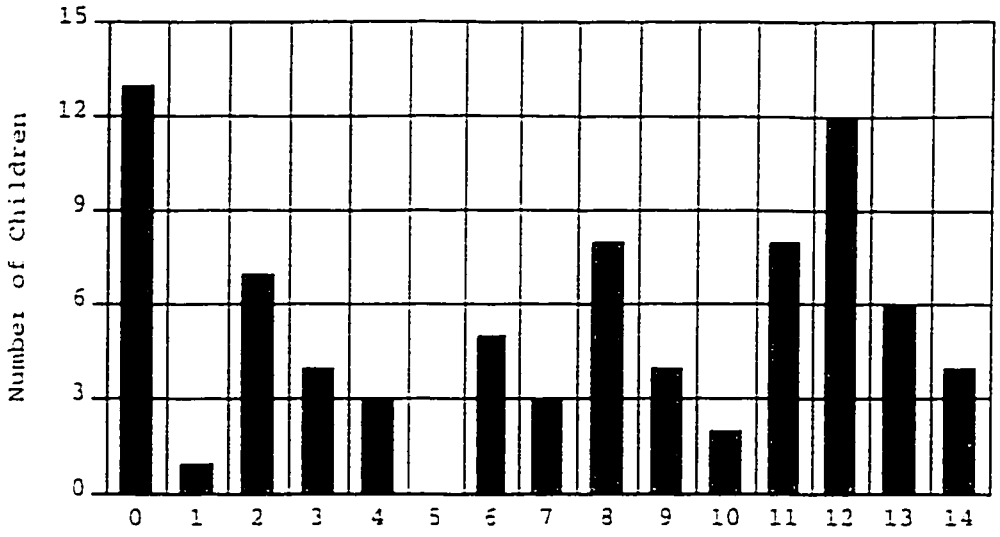
disorders as well as individual patients, it is an area well worth additional attention.

Table 1. Demographic Characteristics of the Sample

	Total Sample (N = 80)	ADHD group (n = 44)	non-ADHD group (n = 36)
Age			
M	10.25	9.93	10.63
SD	(2.37)	(2.11)	(2.63)
Number of K-SADS ADHD symptoms		[a]	[b]
M	7.20	11.05	2.50
SD	(4.80)	(1.94)	(2.48)
CBCL ADHD T-score		[c]	[d]
M	62.66	71.11	52.33
SD	(11.82)	(8.52)	(5.18)
Conners Impulsivity score		[e]	[f]
M	22.11	28.70	14.06
SD	(9.00)	(6.04)	(4.06)
Conners Restlessness T-score		[g]	[h]
M	58.98	68.02	47.92
SD	(60.67)	(10.22)	(6.53)
PPVT Standard Score			
M	101.80	99.80	104.25
SD	(20.76)	(24.32)	(15.32)
SCL-90 Parent Total Psychopathology T-score			
M	55.06	56.81	52.45
SD	(11.14)	(10.62)	(9.70)

Note: Means with different superscripts differ significantly at $p < .05$.

Figure 1. Frequency Distribution of ADHD Symptoms



0 - 5 Symptoms = Normal
6 - 10 = Mild/Moderate
11 - 14 = Severe

Table 2. Demographic Characteristics of the Three Levels of ADHD Groups

	Normal (n = 28)	Subclinical/moderate ADHD (n = 22)	Severe ADHD (n = 30)
Age			
M	10.61	10.69	9.58
SD	(2.43)	(2.41)	(2.21)
Number of K-SADS ADHD symptoms			
M	1.39[a]	7.77[b]	12.20[c]
SD	(1.47)	(1.27)	(1.00)
CBCL Attention Problems subscale T-score			
M	51.11[d]	64.27[e]	72.27[f]
SD	(2.66)	(10.86)	(7.91)
Conners Impulsivity score			
M	13.32[g]	22.59[h]	29.97[i]
SD	(3.54)	(7.20)	(5.72)
Conners Restlessness T-score			
M	47.18[j]	58.14[k]	70.60[l]
SD	(6.11)	(11.83)	(8.46)
PPVT Standard Score			
M	104.89	98.86	101.07
SD	(16.61)	(24.26)	(21.79)
SCL-90 Parental Total Psychopathology T-score			
M	52.81	55.59	56.28
SD	(9.83)	(8.16)	(12.27)

Note: Means with different superscripts differ significantly at $p < .05$.

Table 3. Pearson-Product Moment Correlations Between PPVT-R Scores and Emotion Appraisal and Regulation Variables.

	Second Puzzle	Third Puzzle
Appraisal of Own Emotion	-.11	-.05
Appraisal of Parent's Emotion	-.11	-.08
Matching Own Emotion & Expression	-.09	.14
Matching Parent's Emotion & Expression	-.13	.17
Child Rule Infractions	.08	-.00
Child Behavior	.02	-.05
Child Negativity	-.04	-.04
Child Joint Participation	.14	.12
Child Positivity	-.05	-.07
Parent Rule Infractions	.12	----
Parent Behavior	.12	----
Parent Frustration Management	-.03	.08
Parent Instruction	-.05	.11
Parent Joint Participation	.17	.19
Negative Parenting	-.17	-.01
Positive Parenting	.21	.09

Note: Analyses were not conducted with variables without reported correlations because the variables had no variance. N = 80.

Table 4. Pearson-Product Moment Correlations Between Parental Psychopathology and Emotion Appraisal and Regulation Variables for ADHD Children.

	Second Puzzle	Third Puzzle
Appraisal of Own Emotion	-.22	.01
Appraisal of Parent's Emotion	.14	-.22
Matching Own Emotion & Expression	.06	-.03
Matching Parent's Emotion & Expression	-.04	-.19
Child Rule Infractions	.18	.12
Child Behavior	.13	-.06
Child Negativity	.01	.10
Child Joint Participation	.00	.26
Child Positivity	.01	-.06
Parent Rule Infractions	.05	----
Parent Behavior	.05	----
Parent Frustration Management	.00	.03
Parent Instruction	.19	.45*
Parent Joint Participation	.07	.28
Negative Parenting	-.26	-.20
Positive Parenting	.07	.18

Note: Analyses were not conducted with variables without reported correlations because the variables had no variance. $n = 44$.
* $p \leq .05$.

Table 5. Pearson-Product Moment Correlations Between Parental Psychopathology and Emotion Appraisal and Regulation Variables for Children without ADHD.

	Second Puzzle	Third Puzzle
Appraisal of Own Emotion	-.20	-.11
Appraisal of Parent's Emotion	-.19	.12
Matching Own Emotion & Expression	.17	-.05
Matching Parent's Emotion & Expression	-.04	.30
Child Rule Infractions	.13	———
Child Behavior	———	———
Child Negativity	-.19	-.35
Child Joint Participation	-.26	-.22
Child Positivity	-.03	-.24
Parent Rule Infractions	-.28	----
Parent Behavior	———	----
Parent Frustration Management	.06	-.06
Parent Instruction	.08	-.13
Parent Joint Participation	-.33	.10
Negative Parenting	-.40*	-.23
Positive Parenting	.20	-.05

Note: Analyses were not conducted with variables without reported correlations because the variables had no variance.
$n = 36$.
* $p \leq .05$.

Table 6. Relationship of Child's Age to the Emotion Appraisal and Regulation Variables.

	Second Puzzle	Third Puzzle
Appraisal of Own Emotion	-.10	-.24*
Appraisal of Parent's Emotion	-.22	-.29**
Matching Own Emotion & Expression	-.08	-.10
Matching Parent's Emotion & Expression	-.40**	-.13
Child Rule Infractions	-.25*	-.26*
Child Behavior	-.06	.06
Child Negativity	-.08	.15
Child Joint Participation	-.29**	-.28*
Child Positivity	-.12	-.26*
Parent Rule Infractions	.04	----
Parent Behavior	.07	----
Parent Frustration Management	-.24*	-.09
Parent Instruction	-.24*	-.18
Parent Joint Participation	-.28*	-.20
Negative Parenting	-.03	.00
Positive Parenting	-.20	-.16

Note: Analyses were not conducted with variables without reported correlations because the variables had no variance. $N = 80$.
* $p \leq .05$; ** $p \leq .01$.

Table 7. Comparisons of Child Emotion Appraisal Variables for ADHD vs. non-ADHD Children

Variable	*F* statistic	Significance Level
Time (second vs third puzzle)	8.59	.004**
Time X Age	1.17	.28
Time X ADHD status	12.47	.001***
Appraisal (own vs parent)	1.23	.27
Appraisal X Age	.28	.60
Appraisal X ADHD status	1.34	.25
Time X Appraisal	.99	.32
Time X Appraisal X Age	.24	.63
Time X Appraisal X ADHD status	.002	.97

** $p < .01$
*** $p \leq .001$

Table 8. Descriptive Statistics and Significance Levels for Comparisons of Child Appraisal Variables for ADHD vs. non-ADHD Groups.

	Time 1 (2nd puzzle)	Time 2 (3rd puzzle)
ADHD	*	
M	2.15	2.55
SD	.70	.67
non-ADHD	*	
M	1.85	2.78
SD	.57	.42

Note: Lower numbers signify lower appraisal skills.
* $p < .07$; ** $p < .05$

Table 9. Comparisons of Child Emotion Appraisal Variables for Normal, Mild/Moderate ADHD versus Severe ADHD Groups

Variable	*F* statistic	Significance Level
Time (second vs third puzzle)	8.9	.004**
Time X Age	1.46	.23
Time X ADHD status	6.51	.002**
Appraisal (own vs parent)	1.7	.20
Appraisal X Age	.49	.49
Appraisal X ADHD status	.44	.65
Time X Appraisal	1.04	.31
Time X Appraisal X Age	.28	.60
Time X Appraisal X ADHD status	.07	.94

** $p < .01$

Table 10. Descriptive Statistics for Comparisons of Child Appraisal Variables for the three Level of ADHD Groups.

	Time 1 (2nd puzzle)	Time 2 (3rd puzzle)
Normal		
M	1.82	2.79
SD	.57	.42
Mild/moderate ADHD		
M	2.02	2.68
SD	.66	.55
Severe ADHD		
M	2.18	2.51
SD	.70	.69

Note: Lower means signify lower appraisal skills.

Table 11. Comparisons of Child's Ability to Match Emotion with its Pictorial Representation Variables for ADHD versus non-ADHD Children

Variable	*F* statistic	Significance Level
Time (second vs third puzzle)	.22	.64
Time X ADHD status	7.34	.008**
Appraisal (own vs parent)	6.99	.01**
Appraisal X ADHD status	4.94	.03*
Time X Appraisal	4.15	.05*
Time X Appraisal X ADHD status	.07	.79

* $p \leq .05$
** $p < .01$

Table 12. Descriptive Statistics and Significance Levels for Comparisons of Children's Ability to Match Emotion with its Pictorial Representation for ADHD versus non-ADHD Groups.

	Time 1 (2nd puzzle)	Time 2 (3rd puzzle)	Appraisal 1 (own emotion)	Appraisal 2 (parent emotion)
ADHD	[a]		[b]	
M	2.30	2.67	2.50	2.48
SD	.70	.58	.56	.59
non-ADHD	[a]		[b]	
M	1.88	2.81	2.21	2.47
SD	.73	.39	.59	.54

Note. Means having the same superscript differ according to Simple Effects comparisons ($p \leq .05$).

Table 13. Descriptive Statistics and Significance Levels for Comparisons of Children's Ability to Match Emotion with its Pictorial Representation for ADHD versus non-ADHD Groups - Time X Appraisal Interaction.

	Time 1 (2nd puzzle)	Time 2 (3rd puzzle)
Appraisal 1 (own emotion)		
	^{c}	
M	1.92	2.80
SD	1.00	.58
Appraisal 2 (parent emotion)		
	^{c}	
M	2.29	2.66
SD	.89	.71

Note. Means having the same superscript differ according to Simple Effects comparisons ($p \leq .05$).

Table 14. Comparisons of Child's Ability to Match Emotion with its Pictorial Representation Variables for Normal, Mild/Moderate ADHD versus Severe ADHD Groups

Variable	*F* statistic	Significance Level
Time (second vs third puzzle)	.48	.49
Time X ADHD status	5.49	.006**
Appraisal (own vs parent)	7.17	.0098*
Appraisal X ADHD status	2.45	.09
Time X Appraisal	3.81	.06
Time X Appraisal X ADHD status	.20	.82

* $p \leq .05$
** $p < .01$

Table 15. Descriptive Statistics and significance Levels for Comparisons of Children's Ability to Match Emotion with its Pictorial Representation for the three Level of ADHD groups.

	Time 1 (2nd puzzle)	Time 2 (3rd puzzle)	Appraisal 1 (own emotion)	Appraisal 2 (parent emotion)
Normal				
M	1.82[a]	2.81	2.18	2.45
SD	.73	.40	.57	.55
Mild/moderate ADHD				
M	2.05	2.78	2.34	2.48
SD	.79	.48	.66	.58
Severe ADHD				
M	2.42[a]	2.64	2.55	2.50
SD	.62	.60	.52	.57
Overall				
M	2.11	2.73	2.37[b]	2.48[b]
SD	.74	.50	.59	.56

Note. Means having the same superscript differ according to Simple Effects comparisons ($p \leq .05$).

Table 16. Univariate Comparisons of Child Emotion Regulation Variables for ADHD versus non-ADHD Children

Variable	*F* statistic	Significance Level
Second Puzzle Box		
Rule Infractions	2.40	.13
Behavior	2.38	.13
Negativity	1.15	.29
Joint Participation	.04	.83
Positivity	.02	.89
Third Puzzle Box		
Rule Infractions	1.83	.18
Behavior	2.48	.12
Negativity	6.12	.02*
Joint Participation	.04	.84
Positivity	.48	.49

* $p < .05$.

Table 17. Univariate Comparisons of Child Emotion Regulation Variables for Normal, Mild/Moderate ADHD and Severe ADHD groups

Variable	*F* statistic	Significance Level
Second Puzzle Box		
Rule Infractions	.82	.44
Behavior	.81	.44
Negativity	2.99	.06
Joint Participation	1.70	.19
Positivity	.63	.54
Third Puzzle Box		
Rule Infractions	2.09	.13
Behavior	1.18	.31
Negativity	3.43	.04*
Joint Participation	.83	.44
Positivity	.98	.38

* $p < .05$.

Table 18. Univariate Comparisons of Parent Emotion Regulation Variables for ADHD versus non-ADHD Children.

Variable	*F* statistic	Significance Level
Second Puzzle Box		
Rule Infractions	.14	.25
Behavior	.64	.43
Frustration Management	.18	.67
Instruction	.83	.37
Joint Participation	.65	.42
Negative Parenting	1.82	.18
Positive Parenting	.62	.43
Third Puzzle Box		
Rule Infractions	----	----
Behavior	----	----
Frustration Management	.15	.71
Instruction	.01	.92
Joint Participation	3.20	.08
Negative Parenting	1.67	.18
Positive Parenting	3.09	.08

Note: Analyzes were not conducted with variables without reported results because the variables had no variance.

Table 19. Univariate Comparisons of Parent Emotion Regulation Variables for Normal, Mild/Moderate ADHD, and Severe ADHD Groups.

Variable	*F* statistic	Significance Level
Second Puzzle Box		
Rule Infractions	2.01	.14
Behavior	.98	.38
Frustration Management	.78	.46
Instruction	.98	.38
Joint Participation	.92	.41
Negative Parenting	.89	.42
Positive Parenting	.94	.40
Third Puzzle Box		
Rule Infractions	----	----
Behavior	----	----
Frustration Management	.35	.70
Instruction	.17	.85
Joint Participation	3.07	.05*
Negative Parenting	1.62	.21
Positive Parenting	4.19	.02*

Note: Analyzes were not conducted with variables without reported results because the variables had no variance.
* $p \leq .05$

Table 20. Relationship of Child Emotion Regulation Variables to Parent Emotion Regulation Variables - Second Puzzle Box

Child Variables	Rule-Violat.	Behav.	Negativ.	Jt-Partic.	Positiv.
Parent Variables					
Rule-Violat.	.27*	.26*	.09	-.05	-.12
Behavior	-.05	-.02	.07	-.05	-.06
Frust. Managemt	-.01	.00	.11	.20	.04
Instruction	.16	.07	.10	.39**	.14
Jt Partic.	-.01	-.14	.06	.58**	.24*
Neg. Parenting	.16	.18	.44**	-.11	.02
Pos. Parenting	-.12	-.11	-.20	.30**	.39**

N = 80.
* p < .05; ** p < .01

Table 21. Relationship of Child Emotion Regulation Variables to Parent Emotion Regulation Variables - Third Puzzle Box

Child Variables	Rule-Violat.	Behav.	Negativ.	Jt-Partic.	Positiv.
Parent Variables					
Rule-Violat.	----	----	----	----	----
Behavior	----	----	----	----	----
Frust. Managemt	-.03	-.07	.13	.24*	.11
Instruction	-.04	-.09	-.06	.41**	.09
Jt Partic.	-.10	-.25*	-.09	.64**	.16
Neg. Parenting	.16	.18	.27*	-.20	-.05
Pos. Parenting	-.11	-.15	-.08	.49**	.38**

Note: Analyzes were not conducted with variables without reported results because the variables had no variance.
N = 80.
* $p < .05$; ** $p < .01$

Table 22. Relationship of Child Emotion Regulation Variables to Parent Emotion Regulation Variables Partialling Out the Effects of ADHD-Symptoms Quantity - Second Puzzle Box

	Child Variables				
	Rule-Violat.	Behav.	Negativ.	Jt-Partic.	Positiv.
Parent Variables					
Rule-Violat.	.32**	.30**	.12	-.03	-.13
Behavior	-.05	-.02	.06	-.05	-.05
Frust. Managemt	-.01	-.01	.07	.20	.07
Instruction	.14	.05	.05	.38***	.15
Jt Partic.	.00	-.14	.05	.59***	.24*
Neg. Parenting	.13	.16	.45***	-.13	-.01
Pos. Parenting	-.10	-.10	-.21	.31**	.40***

N = 80.
* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

Table 23. Relationship of Child Emotion Regulation Variables to Parent Emotion Regulation Variables Partialling Out Effects of ADHD-Symptom Quantity- Third Puzzle Box

Child Variables	Rule-Violat.	Behav.	Negativ.	Jt-Partic.	Positiv.
Parent Variables					
Rule-Violat.	----	----	----	----	----
Behavior	----	----	----	----	----
Frust. Managemt	-.07	-.10	.09	.24	.12
Instruction	-.04	-.08	-.07	.41***	.07
Jt Partic.	-.07	-.23	-.06	.66***	.14
Neg. Parenting	.12	.15	.26*	-.22*	-.02
Pos. Parenting	-.07	-.13	-.06	.51***	.35**

Note: Analyzes were not conducted with variables without reported results because the variables had no variance.
N = 80.
* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

Table 24. Relationship of Child Emotion Regulation Variables to Parent Emotion Regulation Variables Partialling Out the Effects of Parental Psychopathology - Second Puzzle Box

Child Variables	Rule-Violat.	Behav.	Negativ.	Jt-Partic.	Positiv.
Parent Variables					
Rule-Violat.	.31**	.28*	.07	-.06	-.11
Behavior	-.06	-.03	.06	-.05	-.05
Frust. Managemt	-.01	-.00	.08	.21	.06
Instruction	.13	.05	.08	.41***	.14
Jt Partic.	.01	-.14	.04	.58***	.24*
Neg. Parenting	.21	.22	.47***	-.15	-.02
Pos. Parenting	-.14	-.12	-.22	.32**	.41***

N = 80.
* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

Table 25. Relationship of Child Emotion Regulation Variables to Parent Emotion Regulation Variables Partialling Out Effects of Parental Psychopathology - Third Puzzle Box

Parent Variables	Child Variables: Rule-Violat.	Behav.	Negativ.	Jt-Partic.	Positiv.
Rule-Violat.	----	----	----	----	----
Behavior	----	----	----	----	----
Frust. Managemt	-.03	-.06	.12	.25*	.10
Instruction	-.08	-.08	-.09	.40***	.10
Jt Partic.	-.12	-.25	-.10	.64***	.17
Neg. Parenting	.17	.17	.30**	-.20	-.06
Pos. Parenting	-.11	-.14	-.10	.49***	.37**

Note: Analyzes were not conducted with variables without reported results because the variables had no variance.
$N = 80$.
* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

Appendix A

Puzzle Box Assembly Game Description and Instructions

Description of Puzzle Box Game

The top and one side of the puzzle box is made of clear plexiglass. The other side is cloth and contains arm holes through with the child can place their hands. The child must fit wooden pegs into the correct holes without being able to see the peg or the board. The parent looks through the plexiglass to coach the child.

Three different wooden peg games can be placed inside the puzzle box. The first and third games are simple games that the child is able to complete. The second game is more difficult, and a buzzer is sounded before the child is able to complete it.

Puzzle Box Game Instructions

A. The first puzzle box game

1. Parent and child are outside of testing room and puzzle box is placed on the table.

2. Simple peg game is placed inside the puzzle box and black cloth covers the plexiglass side and top.

3. Parent and child enter room and sit at chairs centered opposite the plexiglass and armholes.

4. The following instructions are read to the parent and child:

"This is a box with a puzzle inside, where you fit puzzle pieces into holes that have the same shape as the pieces. You (child) will be the player, the person who puts the puzzle together, and you (parent) will be the coach, the

person who helps the player do the puzzle. To put the puzzle together, you (look at child) will have to put your hands inside the box, through these holes in this cover (show child the hand-holes). You are not supposed to see the puzzle, but you can feel of the pieces, and feel where to put them."

(Turn to the parent) "You are the coach, and you aren't allowed to touch the puzzle, but when you lift off this cloth (touch the black covering) you will be able to see the puzzle and the puzzle pieces. Your job as coach is to help (name of child) get the pieces in the puzzle holes before this buzzer goes off (camera person demonstrates the buzzer). When the starting buzzer goes off, take off this cover, and then you can see. Don't take the cover off until you hear the starting buzzer."

(Say to both) "You will start when the buzzer sounds. Just before you finish, there will be a short buzz (short buzz is demonstrated), to tell you that you are almost out of time, and when you hear a long buzz (long buzz sounds), you must stop immediately."

"You will have just a short time to work the puzzle. Do you understand? Any questions? (answer any questions)
Okay, (turn to child) now I want you to put your hands through these holes. When your hands are through, hold them together like this (demonstrate hands clasped with finger intertwined) until you hear the buzzer. Remember, follow the rules, and don't start until you hear the buzzer."

5. Experimenter leaves the room and goes to the observation room to watch. They re-enter as soon as the first

puzzle is finished.

6. Experimenter asks the parent and child, "How did you do? (listen to their reply). Good. Now I will be in the other room for just a minute getting the next puzzle ready. Please wait."

B. The second puzzle box game

1. Experimenter replaces easy puzzle with hard puzzle and re-enters the testing room.

2. The puzzle box instructions are reviewed. "Here is another puzzle. (Experimenter helps the child put their hands through the holes.) Remember, grab your hands together like this (demonstrate) and keep them together until the first buzzer sounds. Any questions? Remember, follow the rules, start when the buzzer sounds, hurry up when the warning buzzer goes off, and stop as soon as the long buzzer sounds."

3. Experimenter leaves room and watches through the observation mirror. Buzzer is sounded before child is able to complete it.

4. Experimenter re-enters the room and asks, "How did you do?" After looking into the puzzle box, experimenter says, "Oh! I'm sorry, this is the wrong puzzle. It is too hard. It is for grown-ups. I'll be right back with the right puzzle."

C. The third puzzle box game.

1. Hard puzzle is replaced with another easy puzzle. Experimenter re-enters room, saying "This is the right puzzle".

2. Instructions are again reviewed.

3. Experimenter leaves room and observes through one-way mirror. They re-enter when child has successfully completed the puzzle, saying "How did you do? Wasn't that better? Good. Now let's go in another room".

D. Post-game interview is completed with child

Appendix B

Post-game Child Interview

Subject # _____

Child Interview for Puzzle Box

You just finished playing with a puzzle box game during which your mother helped to coach you complete the puzzles.

Do you remember how the experimenter brought out three different puzzles? How the first puzzle was easy, the second was a hard one that could not be completed, and the third one was easy and you were able to successfully complete it?

SECOND (HARD) PUZZLE:

1. I'd like you to think about the second puzzle, the hard one that you were unable to finish. How did you feel when that buzzer went off and you couldn't finish the puzzle?

2. (Showing the child the 1 to 5 scale:)
On this scale of 1 to 5, how (name the feeling) did you feel?

_____ Child's rating

3. (Showing the child the faces of the 5 primary emotions:)
Choose which face best matches your feeling when you couldn't finish the puzzle.

_____ Child's choice

4. How do you think your mother felt trying to coach you during that hard puzzle?

5. (Showing the child the 1 to 5 scale:)
On this scale of 1 to 5, how (name the feeling) did your mother feel?

_____ Child's rating

6. (Showing the child the faces of the 5 primary emotions:)
Choose which face best matches your mother's feeling during that hard puzzle.

_____ Child's choice

THIRD PUZZLE:

7. Now I'd like you to think about the third puzzle, the last puzzle that you were able to finish. How did you feel doing that easier puzzle?

8. (Showing the child the 1 to 5 scale:)
On this scale of 1 to 5, how (name the feeling) did you feel?

_____ Child's rating

9. (Showing the child the faces of the 5 primary emotions:)
Choose which face best matches your feeling during the easier puzzle.

_____ Child's choice

10. How do you think your mother felt during the easier puzzle?

11. (Showing the child the 1 to 5 scale:)
On this scale of 1 to 5, how (name the feeling) do you think your mother felt?

_____ Child's rating

12. (Showing the child the faces of the 5 primary emotions:)
Choose which face best matches your mother's feeling during that easier puzzle.

_____ Child's choice

Appendix C

Coding Sheet for Puzzle Box Assembly Game

PUZZLE BOX CODING - THE SECOND (HARD) PUZZLE

Code the second puzzle, the hard puzzle that the child is unable to complete.

Take into account the child's and parent's vocal tone, the content of their speech, their facial expressions, and gestures.

CODING OF CHILD:

Rule infractions - check all that apply, every time they occur

_____ hands are removed from sleeves during episode
_____ child looks under fabric screen
_____ child feels for blocks before buzzer sounds
_____ child looks through plexiglass into box
_____ child keeps working after buzzer sounds
_____ child lies about performance on puzzle (must be obvious, not merely mistaken)
_____ other (describe) _____

Child's emotion immediately after the ENDING buzzer sounds and they couldn't finish the puzzle: (check one)

_____ happy
_____ sad
_____ angry
_____ surprised
_____ fearful
_____ other (specify) _____

Child's behavior overall during the second puzzle:

_____ Child remains engaged in activity; is organized and productive
_____ Child's behavior becomes disruptive and interferes with completion of the task
_____ Child withdraws
_____ Child's behavior stops or becomes very slow; may "freeze" and appear unable to speak or move
_____ other (specify) _____

Degree of frustration/negativity

1	2	3	4	5
child shows little or no negative response to task or task failure; little nervousness or frustration evident		child shows tension and some frustration at task difficulty, but behavior is appropriately on task, and child continues with task; clearly dislikes failure but is not devastated		child shows intense negative response; may not be able to continue; hits box, swears, cries, gets angry or very sad

Degree of positivity

1	2	3	4	5
child rarely smiles, if at all		child smiles, laughs at success, makes mild positive comment: (e.g., "that was fun")		child smiles and laughs hysterically, shouts, jumps up and down

Joint Participation

1	2	3	4	5
child shows no positive response to doing a task with parent, shows little or no excitement during procedure, minimal talk to parent, may seem detached from parent		child's response is positive or interested for the most part, but comments are not directed to parent; doesn't look much or talk much to parent between puzzles		child shows joy at prospect of doing task with parent, discusses performance with parent; may hug, "high-five" mom, refer to joint activity, "we did it!", "yeah for us"

Now rate the parent's emotion and behavior.

PARENT CODING:

Rule Infractions - check all that apply, every time they occur

_____ parent tells child to look inside the box
_____ parent suggests that child feel the blocks before buzzer sounds
_____ parent encourages child to keep working after buzzer sounds
_____ parent lies about child's performance on puzzle (must be obvious, not merely mistaken)
_____ parent puts pieces into puzzle for the child or reaches into the box to help the child
_____ other (describe) _____

Parent's Emotion: Overall, the parent's emotion while they were coaching the child: (check one)

_____ happy
_____ sad
_____ angry
_____ surprised
_____ fearful
_____ other (specify) _____

Parent's Behavior

_____ Parent remains engaged in activity; is organized and productive
_____ Parent's behavior becomes disruptive and interferes with completion of the task
_____ Parent withdraws
_____ Parent's behavior stops or becomes very slow; may "freeze" and appear unable to speak or move
_____ other (specify) _____

Negative Parenting - Rate how harsh and negative the parent is toward their child. Make an overall rating of the episode.

1	2	3	4	5
voice is a bit tense, but has normal intonation		voice is firm or sharp, but not jarring		voice is loud or harsh
negative words are mostly absent or minimal (e.g., "no", "stop")		negative behavior is directed to the task (e.g., "not that one")		negative action or comments are made about the child (e.g., "you klutz, idiot"); parent hits child

Positive Parenting - Rate how positive the parent is in their interactions with their child. Make an overall rating of the episode.

1	2	3	4	5
parent rarely or never sounds positive		parent's voice is high or light		parent sounds giddy, squeals, acts silly, jumps up and down
parent rarely or never smiles at child's behavior		parent smiles, laughs, and gives positive feedback (e.g., "good job, great, that's it")		parent laughs hysterically, shouts not necessarily in in response to child's success

Frustration management for child:

1	2	3	4	5
parent makes no attempt to help child deal with difficulty or failure, or responds with criticism		parent makes mild attempts to help child deal with failure or frustration; (e.g., "it's ok, you did fine", "just keep working")		parent makes extensive effort to help child deal with frustration; (e.g., "take a deep breath and keep on trying"); parent reinterprets failure as success; (e.g., "you did great getting that far on a grown-ups' puzzle")

Instruction

1	2	3	4	5
parent gives few or no instructions to child; may make negative or positive statements but no guidance		parent guides child's actions and gives corrective feedback, but is not consistently helpful; e.g., doesn't account for child having opposite left-right orientation		parent instructions are mostly detailed, positive, and suited to child's needs, e.g., describing shape of pieces and giving child hand signal for directional help; may also help frame and remind child of directions

Joint participation

1	2	3	4	5
parent shows no positive response to doing the task with the child, shows little or no excitement during procedure, minimal talk to child, may seem detached from activity		parent's response is positive for the most part, but comments are about child or task, not much about joint activity		parent shows joy and comments to child about doing task together, and by comments clearly sees that task is something child and parent do together; e.g., "we'll show them", "we are a great team"

PUZZLE BOX CODING - THE THIRD (EASY) PUZZLE

Code the third puzzle, the easy puzzle that the child is able to complete.

Take into account the child's and parent's vocal tone, the content of their speech, their facial expressions, and gestures.

CODING OF CHILD:

Rule infractions - check all that apply, every time they occur

_____ hands are removed from sleeves during episode
_____ child looks under fabric screen
_____ child feels for blocks before buzzer sounds
_____ child looks through plexiglass into box
_____ child keeps working after buzzer sounds
_____ child lies about performance on puzzle (must be obvious, not merely mistaken)
_____ other (describe) _____

Child's emotion during the easier puzzle overall (check one):

_____ happy
_____ sad
_____ angry
_____ surprised
_____ fearful
_____ other (specify) _____

Child's behavior overall during the third puzzle:

_____ Child remains engaged in activity; is organized and productive
_____ Child's behavior becomes disruptive and interferes with completion of the task
_____ Child withdraws
_____ Child's behavior stops or becomes very slow; may "freeze" and appear unable to speak or move
_____ other (specify) _____

Degree of frustration/negativity

1	2	3	4	5
child shows little or no negative response to task or task failure; little nervousness or frustration evident		child shows tension and some frustration at task difficulty, but behavior is appropriately on task, and child continues with task; clearly dislikes failure but is not devastated		child shows intense negative response; may not be able to continue; hits box, swears, cries, gets angry or very sad

Degree of positivity

1	2	3	4	5
child rarely smiles, if at all		child smiles, laughs at success, makes mild positive comment; (e.g., "that was fun")		child smiles and laughs hysterically, shouts, jumps up and down

Joint Participation

1	2	3	4	5
child shows no positive response to doing a task with parent, shows little or no excitement during procedure, minimal talk to parent, may seem detached from parent		child's response is positive or interested for the most part, but comments are not directed to parent; doesn't look much or talk much to parent between puzzles		child shows joy at prospect of doing task with parent, discusses performance with parent; may hug, "high-five" mom, refer to joint activity, "we did it!", "yeah for us"

Now rate the parent's emotion and behavior.

PARENT CODING

Rule Infractions - check all that apply, every time they occur

_____ parent tells child to look inside the box
_____ parent suggests that child feel the blocks before buzzer sounds
_____ parent encourages child to keep working after buzzer sounds
_____ parent lies about child's performance on puzzle (must be obvious, not merely mistaken)
_____ parent puts pieces into puzzle for the child or reaches into the box to help the child
_____ other (describe) _____

Parent's Emotion: Overall, the parent is generally (check one)

_____ happy
_____ sad
_____ angry
_____ surprised
_____ fearful
_____ other (specify) _____

Parent's Behavior

_____ Parent remains engaged in activity; is organized and productive
_____ Parent's behavior becomes disruptive and interferes with completion of the task
_____ Parent withdraws
_____ Parent's behavior stops or becomes very slow; may "freeze" and appear unable to speak or move
_____ other (specify) _____

Negative Parenting - Rate how harsh and negative the parent is toward their child. Make an overall rating of the episode.

1	2	3	4	5
voice is a bit tense but has normal intonation		voice is firm or sharp, but not jarring		voice is loud or harsh
negative words are mostly absent or minimal (e.g., "no", "stop")		negative behavior is directed to the task (e.g., "not that one")		negative action or comments are made about the child (e.g., "you klutz, idiot"); parent hits child

Positive Parenting - Rate how positive the parent is in their interactions with their child. Make an overall rating of the episode.

1	2	3	4	5
parent rarely or never sounds positive		parent's voice is high or light		parent sounds giddy, squeals, acts silly, jumps up and down
parent rarely or never smiles at child's behavior		parent smiles, laughs, and gives positive feedback (e.g., "good job, great, that's it)		parent laughs hysterically, shouts, not necessarily in response to child's success

Frustration management for child:

1	2	3	4	5
parent makes no attempt to help child deal with difficulty or failure, or responds with criticism		parent makes mild attempts to help child deal with failure or frustration; e.g., "it's ok, you did fine", "just keep working"		parent makes extensive effort to help child deal with frustration; (e.g., "take a deep breath and keep on trying"); parent reinterprets failure as success; (e.g., "you did great getting that far on a grown-ups' puzzle")

Instruction

1	2	3	4	5
parent gives few or no instructions to child; may make negative or positive statements but no guidance		parent guides child's actions and gives corrective feedback, but is not consistently helpful; e.g., doesn't account for child having opposite left-right orientation		parent instructions are mostly detailed, positive, and suited to child's needs, e.g., describing shape of pieces and giving child hand signal for directional help; may also help frame and remind child of directions

Joint participation

1	2	3	4	5
parent shows no positive response to doing the task with the child, shows little or no excitement during procedure, minimal talk to child, may seem detached from activity		parent's response is positive for the most part, but comments are about child or task, not much about joint activity		parent shows joy and comments to child about doing task together, and by comments clearly sees that task is something child and parent do together; e.g., "we'll show them", "we are a great team"

Appendix D

Child Assent and Parent Consent Forms

Project Title: Emotional Competence in Children and Their Parents

Project Director: Dr. Rita J. Casey

Child Assent Form

INTRODUCTION:

Children are like their parents in some ways and different in others. We would like to find out how you and your parent are alike and different. We want to get to know both of you to find out how each of you reacts in everyday situations.

PROCEDURE:

We would like you to talk and play with us today. We will ask you some questions about how you react to everyday things. We have a puzzle game for you to complete with your parent. We will show you a videotape and ask you some questions about it. We might make a videotape of you today while you are here.

VOLUNTARY PARTICIPATION/WITHDRAWAL:

You don't have to do this if you don't want to. If there is something we ask you to do and you don't want to do it, you don't have to. Also, you can quit any time you want to, and it will be OK.

CONFIDENTIALITY:

We also promise that we won't talk about you to anyone else except your parents.

CONSENT TO PARTICIPATE IN RESEARCH STUDY:

If you want to help us and be in our project, write your name on this piece of paper. By writing your name, it means that you want to be in the study.

NAME:_____

SIGNATURE OF CHILD:_____ DATE:_____

SIGNATURE OF INVESTIGATOR
OR SPECIFIED DESIGNEE: _____ DATE:_____

Project Title: Emotional Competence in Children and Their Parents

Project Director: Dr. Rita J. Casey

Basic Parental Consent

INTRODUCTION:

You are being asked to participate in a research study of children's emotions and behavior. In this project, we hope to learn how children and their parents respond to everyday situations and whether or not ADHD plays a role in how parents and children react. About 100 parents and their children both with and without ADHD will participate in this project.

PROCEDURE:

If you decide to participate in this project, we will ask you to spend about an hour and a half with us today. During the visit, we will ask you to complete several questionnaires about yourself and your child. You will begin today by completing an interview and questionnaire about how you have been feeling emotionally over the last several months. Then, you will watch a videotape of a child and will be asked to answer questions about it. You will also be asked to participate in an emotion identification task. These two tasks are very similar to tasks your child will complete because we want to see how similarly you and your child respond. Next, we will ask you to participate with your child in a puzzle assembly game. This game shows us how parents and children work together. Finally, we will ask you to complete interviews and a rating scale about your child's behavior over the last few months.

While you are completing the tasks above, your child will be in the next room. He/she will complete a measure of language ability. Then, your child will view the same videotape that you will see and will answer questions about it and will complete an emotion identification task. Your child will also participate in the puzzle assembly game. Finally, your child will be asked how he/she responds to different everyday situations.

All of the information will help us to understand individual differences between children in how they behave or understand their emotions. Should we determine that your child demonstrates more behavior problems than is typical for his/her age, we will discuss those problems with you and suggest resources where you may obtain assistance for your child.

RISKS/SIDE EFFECTS:

There should be few risks or discomforts to you or your child with this procedure other than the possible temporary discomfort of discussion personal information or playing a game.

BENEFITS:

There are no special benefits for you or your child as a result of being in this study, except that you as a parent may become more aware of how your

child responds emotionally. In the unlikely event that we learn anything very unusual about your child that might be a problem to him/her now or in the future, we will call this to your attention. If this happens, we will also give you some suggestions about where to get some help.

COST OF PARTICIPATION:

It will not cost you or your child anything to participate in this study, except the time and effort that is spent to get here and do the things that we ask you to do.

COMPENSATION:

Your child will receive a small gift as thanks for coming and helping us. We will also reimburse you for your travel expenses in coming to our lab. All families will also be paid $5 an hour for their participation in the study, including travel time (approximately $15). We will send the overall results of the study to participating families at the conclusion of the project.

In the unlikely event of any injury to your child resulting from the research study, no reimbursement, compensation, or free medical care is offered by Wayne State University.

VOLUNTARY PARTICIPATION/WITHDRAWAL:

Participation in this study is completely voluntary and you may quit any time you want to. If you don't want to be in the study, there is no penalty. You are also free to decline to answer any questions or participate in any activity that you so choose.

It is important for us to have the free cooperation of parents and children. Therefore, if you agree to participate, your child is also free to be in the study or not as he/she wishes. If your child doesn't want to be in the study, we will not be able to include you in the project even if you want to do so. If you do decide to participate, we will give you a signed copy of this consent form to keep.

QUESTIONS:

If you have questions about your participation in this study now or in the future, please contact Dr. Casey, Jill Norvilitis, or Patricia Johnson at 577-4667. If you have any questions about your rights as a research subject, Dr. Peter Lichtenberg, Chairman of the Behavioral Investigation Committee can be contacted at 577-1628.

CONFIDENTIALITY:

All information that we obtain from you and your child will be kept strictly confidential and will be stored in a locked file cabinet in the possession of Dr. Rita J. Casey in the Laboratory of Emotional Development. Any reported results from the information that you give us will not identify you or your child. Individual information about you or your child will be released to other persons only with your written consent.

Project Title: Emotional Competence in Children and Their Parents

CONSENT TO PARTICIPATE IN RESEARCH STUDY:

If you wish to participate in this study and give permission for your child to participate in this study, please sign on the appropriate line below. Your signature indicates that you have read or have had read to you all the information about this research study, including the research procedure, possible risks, side effects, and the likelihood of any benefits to your child or yourself. Furthermore, your signature indicates that you understand the content and meaning of this information, and have had it explained to your satisfaction. Finally, by signing you indicate that you will be given a signed copy of this consent form.

SIGNATURE OF ADULT
(PARENT) SUBJECT:_____ DATE:_____

SIGNATURE OF WITNESS:_____ DATE:_____

SIGNATURE OF INVESTIGATOR OR
SPECIFIED DESIGNEE:_____ DATE:_____

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ABSTRACT

EMOTIONAL COMPETENCE IN CHILDREN WITH ADHD: CONTRIBUTIONS OF SYMPTOM SEVERITY

by

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The study investigated the emotional competence in children with Attention-Deficit Hyperactivity Disorder (ADHD), explored the possibility of differences between the behavior of parents of children with and without ADHD, and considered the relevance of classifying children into groups of normal/nonpathological, mild/moderate ADHD, and severe ADHD. It was hypothesized that, compared to normal children, children with ADHD would demonstrate specific deficits in both emotion appraisal and emotion regulation. It was also anticipated that the level of emotional competence deficits would be related to the severity of ADHD.

Eighty (44 ADHD and 36 normal) children and their parents participated in a puzzle box assembly game which was designed to serve as both a frustration and success task. Children with ADHD were found to be better able to identify emotion in a negative social situation as compared to non-ADHD children. No differences were found between the groups in their ability to assess emotion in a positive social situation or

acontextual task. Children diagnosed with ADHD were also better able than non-ADHD children in their ability to match their own emotion with its pictorial representation for the negative emotion condition.

In addition, ADHD children demonstrated higher levels of frustration during a positive social situation. It was also found that children with mild/moderate ADHD displayed the highest level of negativity. Parents of ADHD children and non-ADHD children did not differ in terms of task-interfering behaviors, frustration management, instruction, joint participation, negative parenting, or positive parenting. However, when level of ADHD symptomatology was taken into consideration, differences were found between the groups, with parents of children with mild/moderate ADHD displaying the lowest level of joint-participation and positive parenting in a positive social situation.

Symptom severity was a useful distinguishing factor for a few of the variables (e.g., parent emotion-regulation variables). Possible explanations for the findings as well as suggestions for future research are discussed.

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