RELATIONS AMONG ADULT ADHD SYMPTOMS AND CHILD ADHD, ODD, AND PARENT-CHILD INTERACTIONS

By

ALISON REBECCA ZISSER

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RELATIONS AMONG ADULT ADHD SYMPTOMS AND CHILD ADHD, CHILD ODD, AND PARENT-CHILD INTERACTIONS

By

Alison Rebecca Zisser

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Major: Psychology -- Clinical and Health Psychology

This study quantified the relationship between adult ADHD symptomatology and child ADHD and ODD symptomatology in mother-child dyads and investigated how adult ADHD symptomatology is related to parent behavior during parent-child interactions. Data from 26 mother-child dyads participating in a family-based, behavioral treatment program for child ADHD were used in the analyses. Findings revealed significant relations between adult inattention and child attention problems as well as between adult inattention and child ODD symptomatology. The results also indicated that across three standardized play situations, adult inattention was related to less direction of the child’s play, and greater maternal ADHD symptomatology as a child was related to more negativity towards the child. Maternal inattention was also associated with greater maternal impatience during a play situation in which the mother was instructed to follow the child’s lead. Results highlight the relationship between maternal ADHD symptomatology and child symptomatology and demonstrate how parents may present differently during parent-child interactions based on their ADHD symptom level.
CHAPTER 1
INTRODUCTION

ADHD in Adulthood

Attention Deficit Hyperactivity Disorder (ADHD), a childhood-onset condition marked by symptoms of inattention, hyperactivity, and impulsivity, was once thought to be a disorder of childhood, outgrown in the adolescent and early adulthood years. Research over the past fifteen years, however, has demonstrated that ADHD symptoms do not simply dissipate with age, but often persist throughout adulthood and affect the individual’s psychosocial functioning in personal and professional domains (Borland & Heckman, 1976; Murphy & Barkley, 1996). In fact, family studies of children with ADHD and normal controls have shown that 15 to 20% of mothers of children with ADHD have ADHD themselves (Biederman, et al., 1992). As research on childhood ADHD treatment turns to more behavioral, family-based models as an alternative to medication, it is critical to understand how ADHD symptoms affect not only the child, but also the parent involved in the child’s treatment.

The prevalence of adult ADHD is estimated between 3% and 6%, with 49% to 66% of childhood cases later meeting diagnostic criteria for ADHD in adulthood or expressing significant symptoms of the disorder (Barkley, Fischer, Smallish, & Fletcher, 2006; Murphy & Barkley, 1996). Family and twin studies have demonstrated the heritability of ADHD at 60 to 90%, suggesting that researchers and clinicians must attend not only to a child’s ADHD symptoms, but also to the potential for ADHD symptoms in the child’s parents (Levy, Hay, McStephen, Wood, & Waldman, 1997; Smalley et al., 2000).

Both children and adults with ADHD experience impairment in cognitive, scholastic/vocational, and interpersonal domains (Dinn, Robbins, & Harris, 2001; Murphy & Barkley, 1996; Schweitzer et al., 2000). Although the overt hyperactive and impulsive symptoms
seen in childhood ADHD decline with age, inattentive symptoms tend to remain stable through adulthood (Hart, Lahey, Loeber, Applegate, & Frick, 1995) and lead to functional impairments in many facets of adult life. Adults with ADHD report more difficulties in work, more job changes, and lower socioeconomic status than their non-ADHD siblings (Borland & Heckman, 1976) as well as more psychological maladjustment than other adults (Morrison, 1980; Murphy & Barkley, 1996). Adult ADHD has also been associated with higher rates of family conflict and divorce (Biederman, Faraone, & Monuteaux, 2002).

**Adult ADHD and Parenting**

Clinical and empirical evidence suggests that persistent and pervasive symptoms of inattention, hyperactivity, and impulsivity may hinder the ability of adults with ADHD to parent effectively (Murray & Johnston, 2006). Parenting is among the most important and perhaps the most demanding responsibility many individuals will face in adulthood. Until recently, however, this domain of adult functioning was largely overlooked by research on adult ADHD. Deficiencies in executive functioning in adults with ADHD, such as an inability to redirect attention or effectively apply problem-solving strategies, may contribute to a parent’s difficulties in organizing normal activities of daily living (Sonuga-Barke, Daley, & Thompson, 2002).

Murray and Johnston (2006) found highly significant deficiencies in parental monitoring, consistent discipline, and effective problem solving in adults with ADHD, related to the parents’ deficits in attention. Research has shown that parent behaviors such as parental monitoring, consistency, and problem solving have a significant impact on child development and that deficiencies in these domains contribute to child problem behavior (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Dishion & McMahon, 1998). In fact, early interactions between parents and children are considered to have the most significant impact on a child’s behavioral development (Campbell, 1997), and parenting practices continue to influence the
maintenance of externalizing behavior, such as oppositional defiant behavior, during childhood and adolescence (McMahon & Estes, 1997).

Analysis of parental monitoring, defined as attending to where a child is and what the child is doing, have revealed that parents with ADHD establish fewer routines and possess less awareness of their children’s activities than parents without ADHD (Murray & Johnston, 2006). In the Murray and Johnston study, mothers with ADHD reported significantly more inconsistency on scales measuring discipline and parental laxness than parents without ADHD. Lack of parental monitoring has also been associated with disruptive behavior in early childhood and the development of antisocial behavior in middle childhood and adolescence (Dishion & McMahon, 1998; Patterson & Stouthamer-Loeber, 1984).

Parenting by adults with ADHD may be further complicated if the child also has ADHD. Between 40% and 60% of parents with ADHD have children with ADHD (Biederman et al., 1995; Minde et al., 2003). These parents must not only cope with the effects of their own symptoms, but also must manage the challenges of their children’s inattentive and impulsive behaviors. Effective management of childhood ADHD symptoms requires consistency and structure in the child’s daily environment (Pisterman, McGrath, Firestone, & Goodman, 1989), which is particularly difficult for parents with ADHD, who struggle to establish consistency and structure in their own tasks and responsibilities. Parent-child dyads in which both parent and child have ADHD symptoms have been associated with poorer psychological and social functioning of the child than dyads in which only the parent or neither the parent nor the child have ADHD (Minde et al., 2003).

The effect of parent ADHD on the treatment of childhood ADHD is an especially critical question for family-based, behavioral treatment programs. Parent training programs that teach
parents how to interact more effectively with their children and manage their children’s ADHD symptoms provide an alternative to medication for treating children’s problematic behaviors (Chronis, Chacko, Fabiano, Wymbs, & Pelham, 2004). Success in family-based behavioral treatment programs requires the commitment of participating parents to attend weekly sessions, integrate new communication and disciplinary skills, and practice skills daily with their children. ADHD symptoms in parents can interfere with the organization and consistency necessary to assist actively in their children’s treatment (Weiss, Hechtman, & Weiss, 2000).

Investigating the impact of maternal ADHD on a parent training program for preschool children with ADHD, Sonuga-Barke, Daley, and Thompson (2002) found that parent training had no effect on the children’s ADHD symptom level when mothers also displayed significant levels of ADHD symptoms. In contrast, children with ADHD whose mothers reported few ADHD symptoms greatly benefited from the parent training program. The authors suggested that differences in motivational style, difficulties in interpersonal relationships, and cognitive impairment of parents with ADHD might account for the discrepancy in treatment effectiveness (Sonuga-Barke et al., 2002).

**Specific Aims**

The purpose of this study was to investigate how parent ADHD symptoms are manifest at the start of parent-child therapy for children’s ADHD behaviors. The first question was whether there is an association between the level of ADHD symptomatology in the mother and level of ADHD symptomatology and oppositional behavior in the child. Although past research has shown that the prevalence of adult ADHD is higher in parents of children with ADHD than in parents of children without ADHD (Alberts-Corush, Firestone, & Goodman, 1986), no published study to date has investigated the relation between parent and child ADHD symptom severity levels or between parent ADHD and child externalized disruptive behavior, as measured through
symptom level of Oppositional Defiant Disorder (ODD; American Psychiatric Association [APA], 2000), among children with diagnosed ADHD. We hypothesized a positive relation between mother ADHD symptom levels and child symptom levels of both ADHD and ODD in these parent–child dyads.

Our second research question was whether there are observable differences in parent-child interactions based on the parent’s level of ADHD symptomatology. Observational research on parent-child interactions has suggested that the rate of certain hyperactive behaviors in children is influenced by parent behaviors such as more reprimanding, less rewarding, and more direction (Danforth, Barkley, & Stokes, 1991). Determining which parent behaviors during parent-child interactions are associated with adult ADHD would enable future therapists both to recognize these behaviors more easily and to assist parents with ADHD in coping with their own ADHD symptomatology as they learn new communication and parenting strategies. Based on research suggesting that mothers with ADHD are more reactive and negative with their children (Harvey, Danforth, McKee, Ulaszek, & Friedman, 2003), we hypothesized that during structured parent-child interactions, ADHD symptom levels in mothers of children with diagnosed ADHD would be positively associated with the frequency of their verbalizations, with the proportion of negative verbalizations, and with an indicator of their impatience in the parent-child interactions. We further hypothesized that the mothers’ ADHD symptom levels would be positively related to the proportion of commands and negatively related to the proportion of praise in their verbalizations to their child.

A third exploratory aim was to determine if relationships between study constructs vary based on the specific assessment measure used. Past research has shown discrepancy in child symptom severity amongst different informants (i.e., parent versus teacher) (Antrop, Roeyers,
Oosterlaan, & Van Oost, 2003) as well as different methods of measurement (i.e., parent report versus direct observation) (Querido, Eyberg, & Boggs, 2001). Measures used to assist in diagnosis of mental health disorders also differ substantially in the derivation of test items, although differences based on test construction methodology have received little research attention.

Symptom report measures in this study fell into two distinct categories of item derivation – items based on factor analysis and items based on the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV; APA, 2000). The DSM-IV-based measures use items copied closely from the DSM-IV (APA, 2000) symptom criteria and provide a direct comparison to the diagnostic symptom criteria commonly implemented in clinical decision making. However, these rationally derived symptom measures do not account for differences in symptom manifestation at different ages, as the DSM-IV does not tailor symptom criteria to age. Factor analytically derived symptom scales result in a statistical grouping of behavioral items that are related to a common construct or factor for a defined sample (Achenbach & Rescorla, 2000, 2001). Thus, behavioral items for the factor of oppositional behavior may differ for preschool aged children and for school aged children, and both scales may differ from a DSM-IV based scale measuring oppositional behavior. However, it is unknown whether scale derivation of the commonly used ADHD scales affects the pattern of relationships between diagnostic rating scales.
CHAPTER 2
METHODS

Participants

Twenty-six mother-child dyads participated in this investigation. Participants were drawn from a larger study of treatment for young children with ADHD. Participating families met the following inclusion and exclusion criteria: (a) the child was between 4 and 6 years of age; (b) the child met diagnostic criteria for Attention Deficit Hyperactivity Disorder (ADHD) according to both parent and teacher report; (c) the primary maternal caregiver was the child’s biological mother; the mother was willing to participate in the child’s treatment; (d) the child was not taking medication for ADHD; (e) the child was enrolled in a structured daycare, preschool, or school; (f) the mother achieved a standard score of 75 on a cognitive screening measure; (g) the child achieved a standard score of 70 on a cognitive screening measure; and (h) the child had no history of major sensory impairment (e.g., deaf), or pervasive developmental disorder. Families that did not meet study criteria were referred for alternative treatment.

Participant children were 73% \( (n = 19) \) male, with a mean age of 5.42 years \( (SD = .72) \). Their parent-reported ethnic/racial background was 85% \( (n = 22) \) Caucasian, 4% \( (n = 1) \) African American, 8% \( (n = 2) \) Hispanic, and 4% \( (n = 1) \) bi-racial. Of the 25 participating children for whom comorbid diagnostic information was available, 92% \( (n = 23) \) met diagnostic criteria for ODD, 24% \( (n = 6) \) for Conduct Disorder (CD), 8% \( (n = 2) \) for Separation Anxiety Disorder (SAD), and 4% \( (n = 1) \) for Major Depressive Disorder (MDD) in addition to ADHD. Eight percent \( (n = 4) \) of the children received a diagnosis of ADHD without a comorbid diagnosis. Children achieved a mean standard score of 108 \( (SD = 14.05) \) on the Peabody Picture Vocabulary Test (PPVT-III).
Participant mothers had a mean age of 33.44 (SD = 5.97), and their self-identified ethnic/racial background was 77% (n = 20) Caucasian, 8% (n = 2) Hispanic, 4% (n = 1) African American, and 11% (n = 3) Biracial. Sixty-one percent (n = 16) of mothers were married, 12% (n = 3) were separated, 8% (n = 2) were divorced, and 19% (n = 5) were never married. For highest level of educational attainment, 8% (n = 2) of mothers had a graduate or professional degree, 46% (n = 12) had completed college, 39% (n = 10) had completed some college, and 8% (n = 2) had received a high school diploma. Mothers achieved a mean standard score of 106 (SD = 11.00) on the Wonderlic Personnel Test.

Screening Measures

Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2000). The CBCL has different versions for administration to children in the age ranges of 1.5 to 5 years and 6 to 18 years. Because children in this study were 4 to 6 years of age, both versions were used. A T score ≥ 61 was required on the statistically derived Attention Problem Syndrome scale of both versions of the CBCL for study inclusion. Cronbach’s alphas for the Attention Problem Scale were .68 and .86, respectively, and test-retest reliabilities were r = .78 and r = .92, respectively. Standard scores from the Attention Problem Syndrome scale were also used in study analyses as a measure of child ADHD symptomatology.

Conners’ Teacher Rating Scale-Revised: Long Version (CTRS-R: L; Conners, Sitarenios, Parker, & Epstein, 1998). This 59-item teacher rating scale assesses ADHD and common comorbid disorders in children ages 3 to 17 years. A T score ≥ 65 on either the DSM-IV Hyperactive/Impulsive subscale or the DSM-IV Total Problems subscale of the CTRS-R: L was required for study inclusion. The DSM-IV Hyperactive-Impulsive subscale was used in study analyses as a teacher-reported, rationally derived scale that corresponds with DSM-IV criteria for
hyperactive behavior. Internal reliability coefficients for the DSM-IV Hyperactive-Impulsive subscale range from .82 to .95 across male and female 3 to 8 year olds.

**Diagnostic Interview Schedule for Young Children** (YC-DISC; Strong, Lucas, & Lucas, 2006). The YC-DISC, a computer-assisted diagnostic interview for preschool-aged children, is a downward extension of the DISC-IV-P (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000). The psychometric properties of the YC-DISC have not yet been established, but its high similarity to the DISC-IV-P suggests that these properties may be similar. One-week test-retest reliabilities of the DISC-IV-P with parents of 9- to 17-year-old children for the 5 diagnostic categories used in this study have been reported at .79 for ADHD, .54 for ODD, .54 for CD, .58 for SAD, and .66 for MDD (Shaffer, Fisher, & Lucas, 1998). The YC-DISC was used in this study because symptom items are worded more appropriately for young children than its parent measure. Children were required to meet diagnostic criteria for ADHD-Hyperactive type or ADHD-Combined type for inclusion in this study.

**Peabody Picture Vocabulary Test-Third Edition** (PPVT-III; Dunn & Dunn, 1997). The PPVT-III is a well-standardized measure of receptive language in individuals age 2.6 years and older. Split-half reliability coefficients for children have ranged from .86 to .97, with a median of .94, and test-retest reliabilities have ranged from .91 to .94. A PPVT-III standard score at or above 70 was required for inclusion of children in this study.

**Wonderlic Personnel Test** (WPT; Dodrill, 1998). The WPT is a 50-item screening scale of adults' intellectual abilities. In a sample of 120 normal adults, the WPT score was highly correlated (r = .93) with the WAIS Full Scale IQ score and was within 10 points of the WAIS IQ score for 90% of the sample. A WPT standard score of 75 or higher was required for inclusion of parents in this study.
Study Measures

Clinical Interview. An unstructured clinical interview was constructed for use with the mothers in this study. The interview addressed the child’s developmental, medical, and school history, as well as problem behaviors and discipline techniques implemented in the home. The clinical interview also included several questions related to whether the biological mother, biological father, or other family members living in the home had been diagnosed with ADHD or had experienced symptoms of ADHD. If the mother or a family member had been diagnosed with ADHD, the mother was asked to indicate whether she or the family member had received treatment for the ADHD symptoms.

Adult Self Report for Ages 18-59 (ASR; Achenbach & Rescorla, 2003). The ASR is a 123-item self-report measure of adult emotional and behavioral problems. The ASR Attention Problems Syndrome scale was used as a statistically derived measure of parent problem behaviors associated with attention difficulties. The Attention Problems Syndrome scale has one-week test-retest reliability of .91 and internal consistency (alpha coefficient) of .87.

Conners’ Adult ADHD Rating Scale – Self-Report: Short Version (CAARS-S:S; Conners, Erhardt, & Sparrow, 1999). The CAARS-S:S is a 26-item, statistically-derived, self-report scale of current adult ADHD symptoms that was administered to the mothers. The 26 items are grouped into factor-analytically-derived subscales that include an Inattention/Memory Problems scale and a Hyperactivity/Restlessness scale. An ADHD index score is also provided as a summary measure of adult ADHD symptomatology. Internal reliability coefficients varying from .80 to .82 for the ADHD index, .80 to .81 for the Inattention/Memory Problems scale, and .80 to .83 for the Hyperactivity/ Restlessness scale have been reported.
Wender Utah Rating Scale – Short Version (WURS; Wender & Reimherr, 1993). The WURS is a 25-item retrospective measure of adults’ ADHD symptoms during childhood. The items fall into two sections: (a) “As a child, I was” consisting of 22 general traits and (b) “As a child in school, I was” consisting of three school-related traits. Each item is scored on a five-point scale, from (0) *Not at all* or *Very Slightly* to (4) *Very Much*, indicating the extent to which the trait describes the parent during childhood. High internal consistency \((\alpha = .91)\) and test-retest reliability \((.88)\) have been reported.

Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2000). In addition to the Attention Problems syndrome scale, described under screening measures, the Aggressive Behavior syndrome scale was included in study analyses. A statistically derived measure of oppositional and conduct-disordered behavior, the Aggressive Behavior syndrome scale has shown good reliability, with Cronbach’s alpha on the 1.5 to 5 year-old version of .92 and on the 6 to 18 year-old version of .94, and one-week test-retest reliabilities of .87 and .90, respectively.

Conners’ Teacher Rating Scale-Revised: Long Version (CTRS-R: L; Conners et al., 1998). In addition to the Conners DSM-IV Hyperactive-Impulsive scale detailed above, the Conners DSM-IV Inattentive scale was used as a rationally derived DSM-based teacher-report measure of inattentive behavior in children. The Conners DSM-IV Inattentive subscale has internal reliability coefficients that range from .87 to .95 for male and female 3- to 8-year-olds, respectively.

Swanson-Nolan-and-Pelham-IV Rating Scale (SNAP-IV; Swanson, 1992). The SNAP-IV is a rating scale, designed for completion by parents or teachers, that consists of the DSM-IV symptoms for ADHD and ODD. Only the parent completed SNAP-IV scores were used in this study, because not enough teacher forms had been completed at the time of this study. Recent
analysis of the psychometric properties of the SNAP-IV shows acceptable to good internal consistency with an overall coefficient alpha of .94 and coefficient alphas of .90, .79, and .89 for the subdomains of inattention, hyperactivity/impulsivity, and ODD, respectively (Bussing et al., in press). The SNAP-IV Inattention, Hyperactivity/Impulsivity, and ODD subscales were used in this study.

**Dyadic Parent-Child Interaction Coding System (DPICS; Eyberg, Nelson, Duke, & Boggs, 2005).** The DPICS is a behavioral observation system that assesses the quality of parent-child interactions. The DPICS was designed to capture important parent and child behaviors and interaction patterns indicative of maladaptive parenting styles and disruptive child behavior. The DPICS categories include parent verbalizations as well as sequences of dyadic behavior, such as child compliance to parent commands, recorded during 15 minutes of observation on two occasions, one week apart. Categories are coded during three standard 5-minute parent-child interaction situations [child-led play (CLP), parent-led play (PLP), and clean-up (CU)] that vary in the degree of parental control required. For the CLP and PLP interactions, a 5-minute warm-up period precedes the 5-minute coding period. Thus, the DPICS observations require approximately 25 minutes of observation per parent on each of two occasions, and result in a total of 30 minutes of coded mother-child data.

Reliability and validity of the DPICS measures are summarized in the DPICS manual (Eyberg et al., 2005). Post-baccalaureate and graduate student research assistants served as coders. They were trained in the DPICS system and met 80% accuracy in coding criterion tapes before coding parent-child interactions in this study.

Verbal and sequence categories from the DPICS were used to measure maternal behavior during parent-child interactions. Five DPICS categories were analyzed: (a) Total Verbalizations;
(b) Parent Praise; (c) Parent Negative Talk; (d) Parent Commands; and (e) Parent Patience. Category definitions are shown in Table 2-1. Frequency counts of each verbalization or sequence behavior were summed across play situations and averaged across the two observation days. With the exception of Total Verbalizations, the averaged frequency counts were divided by the averaged total verbalizations to represent the percentage of total maternal verbalization that was positive or negative. This procedure controls for the talkativeness of the mother.

Parent Patience was defined as the number of maternal commands given to the child that could not be obeyed because the mother issued another command too quickly or completed the task herself before giving her child adequate time to comply. Commands that referred to future behavior (i.e., Show me when we get home) or that called for unobservable behavior (i.e., Listen to me) were also included in this category. Kappa statistics for the DPICS categories used in this study were: Commands .80, Praise .85, Parent Negative Talk .73, and Patience .71. Kappa values between .61 and .80 indicate Substantial agreement, and kappa values above .81 indicate Almost Perfect agreement (Landis & Koch, 1977).

**Assessment Procedure**

Families attended two 3-hour assessment sessions, scheduled one week apart. The first assessment visit was devoted to completing the informed consent process, determining the families’ eligibility for the study, and if eligible, completing measures addressing the ADHD symptoms of both parent and child. This visit included the clinical interview, the YC-DISC diagnostic interview, and DPICS behavioral observations. Families returned one week later to repeat the behavioral observations to increase the stability of the observational scores. On both occasions, the 25-minute mother-child interaction observations were conducted in the same way. The dyad was observed in the three standard DPICS situations: CLP, PLP, and Clean Up. The parent-child interactions were recorded onto DVD for later scoring.
Study measures were selected from those available in the larger study of treatment for young children with ADHD. Based on DSM-IV (APA, 2000) diagnostic criteria for ADHD, which requires documented impairment in two or more settings, both parent-report and teacher-report measures of child ADHD symptomatology were included. Two different parent-report measures (i.e., CBCL Attention Problems syndrome scale and SNAP-IV Inattention and Hyperactivity scales) were examined to explore the effects of using rationally-derived measures, based on the DSM-IV (APA, 2000), versus statistically-derived measures of child ADHD in the investigation of relations between parent and child symptomatology. Two measures of child oppositional behavior (i.e., the DSM-based SNAP-IV Oppositional Defiant Disorder scale and the statistically-based CBCL Aggression Problems syndrome scale) were also included to explore effects of the different types of diagnostic measures on the study questions.

Three different instruments were used to measure adult ADHD symptomatology. The CAARS and ASR contain statistically-derived measures of current adult ADHD symptomatology. Both instruments were included because the CAARS provides separate measurement of inattention and memory problems versus hyperactivity and restlessness. The ASR Attention Problems Syndrome scale was included in addition to the CAARS scales to measure symptoms of adult inattentiveness as well as problems associated with adult inattentiveness. The items on the ASR Attention Problems Syndrome scale are similar to the inattentive parent behaviors associated with disruptive child behavior (Dishion & McMahon, 1998; Murray & Johnston, 2006). Finally, the WURS was included in the second study question as a retrospective measure of ADHD symptoms the mothers experienced as a child. Because DSM-IV (APA, 2000) ADHD diagnostic criteria requires the presence of inattentive and/or hyperactive symptoms prior to age 7, the WURS was selected to determine how the ADHD
symptomatology experienced by the mothers as children related to maternal behavior during parent-child interactions.
Table 2-1: Dyadic Parent Child Interaction Coding System composite categories

<table>
<thead>
<tr>
<th>Category</th>
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<tbody>
<tr>
<td>Total Parent Verbalizations</td>
<td>pNegative Talk + pCommand + pPraise + pQuestions + pReflections + pDescriptions + pNeutral Talk</td>
</tr>
<tr>
<td>Percent Praise</td>
<td>pPraises / Total Parent Verbalizations</td>
</tr>
<tr>
<td>Percent Commands</td>
<td>pCommands / Total Parent Verbalizations</td>
</tr>
<tr>
<td>Percent Negative Talk</td>
<td>pNegative Talk / Total Parent Verbalizations</td>
</tr>
<tr>
<td>Parent Patience</td>
<td>cNo Opportunity to Comply / (cComply + cNon-Comply + cNo Opportunity to Comply)</td>
</tr>
</tbody>
</table>

*Note.* The subscript p indicates the parent category, and the subscript c indicates the child category.
CHAPTER 3
RESULTS

Descriptive Data for Mothers

Based on their self-report during the clinical interview, 15% (n = 4) of the mothers in this study reported having received a diagnosis of ADHD, and 15% (n = 4) reported having experienced symptoms of ADHD but not having received a diagnosis. Of the mothers who either had received an ADHD diagnosis or experienced symptoms of ADHD, only 8% reported currently receiving treatment for their ADHD symptoms. In contrast to mothers who reported neither a diagnosis nor symptoms of ADHD, the mothers who reported either a diagnosis or symptoms scored significantly higher on three of the four adult ADHD measures, including the CAARS adult ADHD index, $t(24) = -3.02, p < .01$, the CAARS adult Hyperactivity/Restlessness scale, $t(24) = -3.01, p < .01$, and the WURS retrospective measure of ADHD symptoms as a child, $t(24) = -3.17, p < .01$. Mothers who reported a diagnosis of ADHD did not differ significantly from mothers who reported symptoms but no diagnosis on these same measures [CAARS ADHD index, $t(6) = -1.19, p = .28$, CAARS Hyperactivity/Restlessness scale, $t(6) = -1.44, p = .20$, and WURS, $t(6) = -2.14, p = .08$] as well as on the ASR Attention Problems Syndrome scale, $t(6) = -1.47, p = .19$.

Scores ranged from 0 to 27 on the CAARS ADHD index. Using criteria established by Conners, Erhardt, and Sparrow (1999), 4% (n = 1) of mothers scored in the Much Above Average range (CAARS T score > 66) for Adult ADHD, 23% (n = 6) were in the Above Average range (CAARS T score 56 – 65) for Adult ADHD, 27% (n = 7) were in the Average range (CAARS T-score 45 – 55) for Adult ADHD, 38% (n = 10) of mothers were in the Below Average range (CAARS T-score 35 – 44) for Adult ADHD, and 8% (n = 2) of mothers scored in the Much Below Average Range (CAARS T-score 30 – 34) for Adult ADHD.
Scores ranged from 0 to 23 on the ASR Attention Problems syndrome scale. Using criteria set forth by Achenbach and Rescorla (2003), 4% (n = 1) of mothers scored in the Borderline Clinical range (ASR T-score 65 – 69) for Adult ADHD, and 12% (n = 3) of mothers scored in the Clinical range (T > 69) for Adult ADHD.

**Analysis of Normality**

Due to small sample size and consequent limited power, normality was determined by examining the absolute value of skewness and kurtosis. Variables with skewness or kurtosis greater than the absolute value of 1.5 were considered non-normal. Measures of adult and child ADHD and child ODD fell within the normal range. Among the measures of observed behavior, Parent Negative Talk and Parent Commands during the Child-Led Play (CLP) situation were transformed using the natural log. Before transformation, the skewness values for Parent Negative Talk and Commands were 2.06 and 2.67, respectively. Before transformation, the kurtosis values for Parent Negative Talk and Commands were 4.40 and 10.41, respectively.

**Consistency among Adult Self-Report and Child Measures of ADHD Symptomatology**

As depicted in table 3-1, the self-report measures of adult ADHD were highly correlated with each other, suggesting consistent reporting of adult ADHD symptomatology by mothers and valid measurement of adult ADHD. Parent measures of child oppositional behavior were also significantly correlated with each other, \( r (n = 23) = .41, p = .05 \).

The parent and teacher measures of child ADHD were less consistently correlated with each other, with statistically significant correlations only between the DSM-based SNAP-IV inattention scale and the statistically derived CBCL measure of child attention problems, \( r (n = 23) = .70, p < .01 \), and between the inattention and hyperactive subscales of the teacher report measures, \( r (n = 23) = .43, p < .05 \). These findings may suggest that teachers discriminate less
well between inattentive and hyperactive symptoms than parents, who may also be more consistent in their reporting of the child’s inattentive symptoms than hyperactive symptoms.

**Pearson Correlational Analyses of Adult ADHD and Child ADHD and ODD**

Pearson correlations were conducted to measure the association between adult ADHD symptomatology and child ADHD symptomatology. With the exception of the CBCL Attention Problems syndrome scale, raw scale scores were first converted to z-scores in order to compare different measures. Normed T scores were used for the CBCL Attention Problems syndrome scale to account for the different scoring of the two CBCL versions implemented in this study. Adjusted $r^2$ and adjusted $r$ values were also calculated through simple regression to control for the small sample size. Adjusted $r$ values are reported for statistically significant relationships. The SNAP-IV was missing for three families and the CTRS was missing for one family. Thus, analyses involving the SNAP-IV were conducted with 23 instead of 26 families, and analyses involving the CTRS and the SNAP-IV were conducted with 22 instead of 26 families.

Table 3-2 displays correlations among the three measures of current adult ADHD symptomatology (as a retrospective measure, the WURS was not included in this analysis) and the five measures of child ADHD symptomatology. Adult ADHD symptomatology was measured by the CAARS Inattention/Memory Problems scale, the CAARS Hyperactivity/Restlessness scale, and the ASR Attention Problems syndrome scale. Child Inattention was measured by the CBCL Attention Problems scale, the SNAP-IV Inattention scale, and the CTRS DSM-IV Inattentive scale. Child Hyperactivity was measured by the SNAP-IV Hyperactivity scale and the CTRS DSM-IV Hyperactive-Impulsive scale. The only significant correlation between an adult ADHD measure and a child ADHD measure was the correlation between the CAARS Inattention/Memory Problems scale and the CBCL Attention
Problems syndrome scale, \( r (n = 23) = .48, p < .05, \text{adjusted } r = .44 \). This relationship is depicted in figure 3-1.

Adult inattention, as measured by the ASR Attention Problems syndrome scale, was significantly correlated with child oppositional behavior, as measured by the SNAP-IV, \( r (n = 23) = .43, p < .05, \text{adjusted } r = .38 \). The association between adult inattention and child oppositional behavior is also depicted in figure 3-2. It is important to note that the CBCL measure of aggressive behavior was not related to any measure of adult ADHD symptomatology. Thus, only one of the measures of child oppositional behavior was related to adult ADHD symptoms. This inconsistency in results will be addressed further in the discussion.

**Analysis of Maternal ADHD Behaviors during Parent-Child Interactions**

The hypothesized relations between maternal ADHD symptomatology and mother-child interaction style were examined using Pearson correlations. After natural log transformation of the observational variables that were not normally distributed, the interaction data were analyzed within each standard DPICS play situation (i.e., Child Led Play [CLP], Parent Led Play [PLP], and Clean-Up [CU]) and across the combined set of observational data. Adjusted \( r \) values, controlling for small sample size, are reported for statistically significant correlation values only. Data from all 26 mother-child dyads were used in the analyses examining relations between adult ADHD and maternal behavior. The intercorrelation matrix is shown in table 3-3.

Maternal self-report of ADHD symptomatology as a child, as measured by the WURS, was positively associated with mothers’ negative talk during interactions with their children, \( r (n = 26) = .49, p = .012, \text{adjusted } r = .45 \). This particular association was the most pronounced during the PLP situation. In contrast to our hypothesis, maternal inattention, as measured by the ASR Attention Problems syndrome scale, was negatively related to mothers’ observed command frequency, \( r (n = 26) = -0.41, p < .05, \text{adjusted } r = -0.37 \). Across play situations, no significant
associations were found between self-ratings of Adult ADHD and observed frequency of total verbalizations, praise of the child, or parent impatience.

During the 5-min Child-Led Play situation [or CLP], parents were instructed to allow their child to lead the play. In this situation, maternal inattention, as measured by the ASR Attention Problems Scale, was positively related to both maternal total verbalization frequency, \( r (n = 26) = .40, p < .05, \text{adjusted } r = .35 \), and maternal impatience, \( r (n = 26) = .50, p < .01, \text{adjusted } r = .47 \). No significant associations were found between measures of maternal ADHD and negative parent verbalizations or parent praise of the child during the CLP situation.

During the Parent Led Play situation [or PLP], parents were instructed to lead the play. Similar to the finding across situations, a near significant negative association was found between ASR maternal inattention and command frequency, \( r (n = 26) = -0.38, p = .053, \text{adjusted } r = -0.33 \). Contrary to our hypothesis, a near significant positive association was found between ASR maternal inattention and praise of the child, \( r (n = 26) = .39, p = .052, \text{adjusted } r = .34 \). As mentioned above, the WURS retrospective measure of maternal ADHD symptomatology was positively related to negative talk towards the child, \( r (n = 26) = .48, p = .014, \text{adjusted } r = .44 \). No statistically significant associations were found during PLP between maternal ADHD and frequency of parent verbalizations or parent impatience. During the Clean Up situation, maternal ADHD symptomatology was not related to any of the hypothesized maternal behaviors.

In exploring the associations between mothers’ ADHD symptomatology and their behavior during parent-child interactions, other factors potentially affecting the mothers’ behavior, such as child ADHD and ODD symptomatology, were explored as potential covariates in predicting maternal behavior. Before controlling for child ADHD and oppositional behavior,
we first conducted correlational analyses to determine whether child inattention, hyperactivity, or oppositional behavior was related to maternal behavior during the play situations. Full consideration of these analyses is beyond the scope of this paper. However, associations in which both maternal attention problems and child ADHD or ODD were found to be significantly related to maternal behavior were reanalyzed using multiple regression to control for the influence of child behavior on parent behavior during parent-child interactions.

Multiple regression, which controlled for child ADHD symptomatology across situations, revealed that maternal inattention remained a significant predictor of parent command frequency during the parent-child interaction ($\beta = -0.43$, $t(20) = -2.28$, $p < .05$). However, after controlling for child hyperactivity during CLP, maternal attention problems was no longer a significant predictor of frequency of parent verbalizations ($\beta = .33$, $t(20) = 1.72$, $p = .10$).
Table 3-1. Pearson correlations between measures of adult ADHD

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CAARS Inattention/Memory Problems</td>
<td>-</td>
<td>0.62**</td>
<td>0.71**</td>
<td>0.39*</td>
</tr>
<tr>
<td>2. CAARS Hyperactivity/Restlessness</td>
<td>-</td>
<td>0.35</td>
<td></td>
<td>0.52**</td>
</tr>
<tr>
<td>3. ASR Attention Problems Syndrome Scale</td>
<td></td>
<td></td>
<td>0.35</td>
<td></td>
</tr>
<tr>
<td>4. WURS Retrospective Measure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. CAARS = Conners' Adult ADHD Rating Scale; ASR Attention Problems = Adult Self Report, Attention Problems Syndrome Scale; WURS = Wender Utah Rating Scale; Sample included 26 families.
*p < 0.05.  ** p < 0.01.
Table 3-2. Pearson correlations between mother and child ADHD measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>CAARS Inattention/ Memory Problems</th>
<th>CAARS Hyperactivity/ Restlessness</th>
<th>ASR Attention Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNAP-IV: Inattention</td>
<td>0.13</td>
<td>-0.07</td>
<td>0.12</td>
</tr>
<tr>
<td>SNAP-IV: Hyperactivity</td>
<td>-0.06</td>
<td>0.01</td>
<td>-0.20</td>
</tr>
<tr>
<td>CBCL: Attention Problems</td>
<td>0.48*</td>
<td>0.23</td>
<td>0.19</td>
</tr>
<tr>
<td>CTRS: DSM-IV Inattentive</td>
<td>-0.22</td>
<td>-0.13</td>
<td>0.02</td>
</tr>
<tr>
<td>CTRS: DSM-IV Hyperactive/ Impulsive</td>
<td>-0.21</td>
<td>-0.04</td>
<td>-0.14</td>
</tr>
</tbody>
</table>

*Note. CAARS = Conners’ Adult ADHD Rating Scale; ASR Attention Problems = Adult Self Report, Attention Problems Syndrome Scale; SNAP-IV = Swanson, Nolan and Pelham Questionnaire; CBCL Attention Problems = Child Behavior Checklist Attention Problems Syndrome Scale; CTRS = Conners’ Teacher Rating Scale; Sample included 23 families, with missing data resulting in differences in the total number of participants for some analyses. *p < 0.05.
Table 3-3. Pearson correlations between adult ADHD and maternal behaviors during parent-child interactions

<table>
<thead>
<tr>
<th>Situation and Measure</th>
<th>Total Verbalizations</th>
<th>Commands</th>
<th>Negative Talk</th>
<th>Praise</th>
<th>Impatience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Across Situations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAARS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inattention/Memory</td>
<td>-0.10</td>
<td>-0.10</td>
<td>0.02</td>
<td>0.06</td>
<td>0.01</td>
</tr>
<tr>
<td>Problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAARS Hyperactivity</td>
<td>-0.10</td>
<td>-0.10</td>
<td>0.32</td>
<td>-0.13</td>
<td>-0.12</td>
</tr>
<tr>
<td>Restlessness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASR Attention Problems</td>
<td>0.26</td>
<td>-0.41*</td>
<td>-0.09</td>
<td>0.23</td>
<td>0.21</td>
</tr>
<tr>
<td>WURS Retrospective</td>
<td>0.06</td>
<td>0.14</td>
<td>0.49*</td>
<td>0.02</td>
<td>0.08</td>
</tr>
<tr>
<td>Child Led Play</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAARS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inattention/Memory</td>
<td>-0.15</td>
<td>-0.24</td>
<td>-0.12</td>
<td>0.10</td>
<td>0.22</td>
</tr>
<tr>
<td>Problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAARS Hyperactivity</td>
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<td>-0.14</td>
<td>0.18</td>
<td>-0.13</td>
<td>0.24</td>
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<tr>
<td>Restlessness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASR Attention Problems</td>
<td>0.40*</td>
<td>-0.36</td>
<td>-0.14</td>
<td>0.10</td>
<td>0.50**</td>
</tr>
<tr>
<td>WURS Retrospective</td>
<td>0.18</td>
<td>0.20</td>
<td>0.37</td>
<td>0.09</td>
<td>0.22</td>
</tr>
<tr>
<td>Parent Led Play</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAARS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inattention/Memory</td>
<td>-0.06</td>
<td>-0.17</td>
<td>0.10</td>
<td>0.16</td>
<td>-0.18</td>
</tr>
<tr>
<td>Problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAARS Hyperactivity</td>
<td>-0.18</td>
<td>-0.13</td>
<td>0.28</td>
<td>-0.02</td>
<td>-0.33</td>
</tr>
<tr>
<td>Restlessness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASR Attention Problems</td>
<td>0.14</td>
<td>-0.38</td>
<td>0.01</td>
<td>0.14</td>
<td>0.02</td>
</tr>
<tr>
<td>WURS Retrospective</td>
<td>-0.24</td>
<td>-0.05</td>
<td>0.48*</td>
<td>-0.24</td>
<td>0.02</td>
</tr>
<tr>
<td>Clean Up</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAARS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inattention/Memory</td>
<td>-0.03</td>
<td>-0.01</td>
<td>0.06</td>
<td>-0.06</td>
<td>0.00</td>
</tr>
<tr>
<td>Problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAARS Hyperactivity</td>
<td>0.14</td>
<td>-0.13</td>
<td>0.30</td>
<td>-0.2</td>
<td>-0.03</td>
</tr>
<tr>
<td>Restlessness</td>
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</tr>
<tr>
<td>ASR Attention Problems</td>
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<td>-0.09</td>
<td>0.00</td>
<td>0.06</td>
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<tr>
<td>WURS Retrospective</td>
<td>0.25</td>
<td>0.31</td>
<td>0.31</td>
<td>-0.06</td>
<td>0.07</td>
</tr>
</tbody>
</table>

Note. CAARS = Conners’ Adult ADHD Rating Scale; ASR Attention Problems = Adult Self Report, Attention Problems Syndrome Scale; WURS = Wender Utah Rating Scale; Sample included 26 families. *p < 0.05. **p < 0.01.
Figure 3-1. Association between maternal inattention (on CAARS) and child attention problems (on CBCL).
Figure 3-2. Association between maternal attention problems (on ASR) and child ODD symptom level (on SNAP-IV).
Adult ADHD and Child Disruptive Behavior

Significant relations were found between maternal inattention and child symptoms of ADHD and ODD, as hypothesized. These findings have not previously been reported, likely due to the recent recognition in the literature that adult ADHD symptomatology significantly impacts parenting behaviors. Studies have begun to demonstrate relations between maternal ADHD symptomatology and deficiencies in parental monitoring, inconsistent discipline, and poor problem solving (Murray & Johnston, 2006; Sonuga-Barke et al., 2002). It is probable that this relation between maternal ADHD symptomatology and ineffective parenting behavior accounts for the relations found between maternal inattention and both child ADHD and ODD symptomatology in our sample of clinic-referred preschoolers.

Although significant relations were found between only certain measures of adult ADHD and certain measures of child ADHD and ODD, the findings are consistent with research suggesting that parenting contributes to the expression of child ADHD symptoms as well as the development of problems comorbid with ADHD (Barkley, 1990). In fact, these results are consistent with previous work suggesting that inattention in parenting tasks contributes to the development and maintenance of disruptive child behavior (Dishion & McMahon, 1998; Dishion, Patterson, Stoolmiller, & Skinner, 1991).

Whereas a significant association was found between maternal inattention and child ADHD and ODD symptoms, no significant association was found between maternal hyperactivity and child ADHD symptomatology or oppositional behavior. The complete absence of evidence relating adult hyperactivity to child behavior problems as manifest in either ADHD or ODD is not surprising, because the negative parenting behaviors such as deficient parental
monitoring and poor problem solving have been attributed to parental inattention but not to parental hyperactivity. In fact, Murray and Johnston (2006) found that parenting practices are more impaired among the inattentive subtype of mothers with ADHD than the combined subtype. They suggested that the higher activity and energy levels of hyperactive mothers may compensate for attention deficits by providing more opportunities to spend time with their children (and thus monitor) their children’s activities (Murray & Johnston, 2006).

Recent findings presented by Chronis et al. (2007) have demonstrated a relationship between maternal inattention and child oppositional behavior but not between adult inattention or hyperactivity and child ADHD symptomatology. It is possible that the relationship between adult inattention and child ADHD symptom expression is more pronounced among younger children than older children (the Chronis study included children between the ages of 6 and 10 years). Differences in findings may also be due to the use of a different measure of child ADHD symptomatology. As is evident in our study, the statistical relationships between constructs differed greatly depending on the specific scale used to measure the construct.

It is important to consider the consistency of the findings. Several measures of adult and child symptomatology were used in this study. Although a significant association was found between the adult CAARS Inattention/Memory Problems scale and the CBCL measure of attention problems in children, no significant association was found between the CAARS measure of adult inattention and the SNAP-IV measure of child inattention or hyperactivity. Similarly, although a significant association was found between the ASR adult syndrome scale of attention problems and the SNAP-IV measure of child ODD symptomatology, no significant association was found between the ASR Attention Problems syndrome scale and the CBCL Aggressive Problems syndrome scale.
Inconsistent findings between measures do not render a particular finding less significant, but they do stimulate questions as to why these differences in relationships among measures emerged. One explanation for the inconsistency in results could be method variance, which is an overlap in variance between two variables due to the type of measurement tool implemented or type of measurement approach used (i.e., scale construction). Method variance may cause observed relationships between constructs to differ from true relationships (Campbell & Fiske, 1959; Doty & Glick, 1998). Method variance may inflate a relationship between two constructs if the methodological components of the individual measures are more positively related than the true relationship between the constructs. Conversely, method variance may deflate the relationship between two constructs if systematic error components of two measures are less positively related than the true relationship (Doty & Glick, 1998). Thus, as an example, combining the two versions of the CBCL Attention Problems syndrome scale into one measure may have introduced systematic error which minimized the potential true association between this measure of child inattention and the ASR Attention Problems syndrome scale for adults.

Results not only varied between measures with differing item derivation (i.e., Statistical versus DSM/Rational approach), but also varied between measures using the same method of item derivation. Without a consistent pattern to the results based on item derivation, we cannot conclude that item-derivation is a factor in the inconsistent relations found between measures. However, it is evident that measure selection significantly affects research findings and that scale construction introduces systematic variance that should be controlled in statistical analyses. Doty and Glick (1998) proposed confirmatory factor analysis (CFA) as a method for reducing systematic error in studies containing multiple measures of one construct. Sample size in this study did not permit the use of CFA. However, future investigation of the study questions with a
larger sample size will make it possible to implement CFA to determine more effectively the nature of associations between adult ADHD and child hyperactive and disruptive behavior.

Another explanation for the inconsistency in results is that a particular significant finding was a statistical anomaly (an explanation made more plausible by a small sample size). However, past research linking parental inattention to the expression of child ADHD and disruptive behaviors (Barkley, 1990; Minde et al., 2003; Murray & Johnston, 2006) reinforces the validity of these findings. It is more likely that although different measures of the same construct may both be valid, they tap into different aspects of the construct and result in different statistical relationships.

**Adult ADHD and Parent Behavior in Parent-Child Interactions**

In addition to investigating relations of maternal ADHD and child behavior, this study examined relations of maternal ADHD and mothers’ behaviors during interactions with their hyperactive young children. Consistent with our hypothesis that mothers with higher levels of ADHD would show more negative behavior towards their child, a particularly intriguing relationship was found between the WURS retrospective measure of maternal ADHD symptomatology and maternal negative talk across the three standard situations. Although maternal Negative Talk was not significantly associated with any measures of current adult ADHD symptomatology, mothers who experienced more ADHD symptoms as children tended to be more critical or sarcastic towards their children. This relationship was especially strong during the PLP situation, in which the parent was instructed to lead the child’s activity. A potential explanation for the relationship between a mother’s ADHD symptom level as a child and negative reactivity towards her child is that mothers with higher symptom levels as children may have developed a need for calm and order to cope with their own symptoms. Interruption by their children could make these mothers especially reactive to their children’s hyperactive behavior.
(Weiss et al., 2000). Periods in which the child is expected to comply with parent direction may become particularly stressful for the ADHD mother, which may result in greater negativity towards the child during the PLP situation.

Across the three structured parent-child situations, maternal inattention was also associated with less maternal direction of the child’s activities, as measured by command frequency. This finding was contrary to our hypothesis, based on research by Harvey et al. (2003), that hyperactivity and impulsivity in mothers with higher levels of ADHD symptomatology would be manifested through more active direction of the child’s play. The negative relation between ADHD symptomatology and parent commands in the mother-child interaction may be due to the more significant role of inattentive than hyperactive symptomatology during the play situation. This finding would be consistent with research showing that mothers with ADHD monitor their children’s activities poorly (Dishion & McMahon, 1998; Murray & Johnston, 2006; Weiss et al., 2000). An inability to attend to and track the child’s play may have created a situation in which the mother’s hyperactivity could not be directly observed in relation to the child.

It is important to note that during the Child Led Play situation [CLP], when mothers are instructed to allow the child to lead the play, inattentive mothers did not give more commands, but showed more impatience in the commands that they gave to the child. During CLP, inattentive mothers were more likely to repeat their commands without allowing the child adequate time to comply, to use quick phrases (e.g., Listen to me) to serve as restatements of their commands, or to complete the task for the child. Research by Harvey et al. (2003) found a similar result that mothers with greater inattention used more repetition when attempting to get their children to comply.
This research has important implications for understanding not only how mothers with ADHD symptomatology interact with their children but also how maternal ADHD symptoms are manifested in the treatment setting. Inattentive mothers who present with their children for family-based treatment of child ADHD may experience more difficulty allowing their child to lead parent-child interactions, evidenced through increased impatience. Allowing the child some control in play contributes to a positive, reciprocal interaction between parent and child. This research suggests that during treatment, parents with ADHD may require more focused coaching in following their child’s lead during play.

When a parent shows evidence of ADHD symptomatology, the therapist may also discuss research findings on mothers with ADHD and directly address and problem solve aspects of the parent-child interaction that are particularly difficult for the parent. Explaining how the mother’s condition is affecting her interaction with her child may relieve some personal attributions of failure if the mother is struggling in skill acquisition. Directly addressing the mother’s ADHD symptoms may also help the mother gain more understanding and control of her own symptoms as well as her child’s symptoms.

**Limitations, Strengths, and Future Directions**

All children who participated in this study met diagnostic criteria for ADHD Hyperactive-type or Combined-type and surpassed a pre-designated cut-off for ADHD symptom expression on both a mother-report and teacher-report rating scale. Thus, all children, regardless of the parent’s ADHD symptom level, entered the study with an elevated level of ADHD symptomatology as compared to a normal sample of 4- to 6-year-old children. Although the children’s scores on the ADHD measures were normally distributed, the restriction in range of child ADHD symptoms likely affected and may have reduced the magnitude of the correlations between adult and child ADHD symptom expression.
Restricting the sample to clinic-referred, 4- to 6-year-old children and their mothers also limited the generalizability of findings to mothers of young children with clinical levels of ADHD. These results cannot be generalized to fathers or to older children with ADHD. Further, most of the children in this sample met criteria for a comorbid diagnosis of ODD. Thus, these results may not generalize to mother-child dyads in which the child has ADHD without a comorbid diagnosis.

The dimensional measurement of maternal ADHD symptomatology should also be noted. Because we did not use a DSM measure of the mothers’ ADHD symptoms, we are unable to determine which mothers met full diagnostic criteria for ADHD. However, two of the adult ADHD scales provided cutoffs indicating ADHD in the clinical range for 12% and in the above average or higher range for 27%. These numbers are fairly consistent with research suggesting that 15 to 20% of mothers of children with ADHD have ADHD themselves (Biederman, et al., 1992).

Further, it is important to acknowledge that adult ADHD frequently co-occurs with other psychological conditions such as antisocial personality, anxiety, depression, or substance use disorders (Borland & Heckman, 1976). Thus, future research must tease apart the role of inattention versus comorbid conditions in contributing to the expression of child symptomatology and maternal behaviors during parent-child interactions.

Although this study did not directly measure parenting practices, several items on the ASR Attention Problems scale (i.e. “I have trouble making decisions”) relate to problematic parenting behaviors cited in the research as related both to adult ADHD and to the development of disruptive behavior in children (Harvey et al., 2003). Still, the inclusion of a measure of parenting practices in future research would permit confirmation of the meditational role of
ineffective parenting practices assumed to be operating among inattentive mothers in the development of disruptive child behavior.

Despite the limitations of this study, there are several important strengths. To our knowledge, this is the first study to investigate the relationship between symptom level of maternal ADHD and symptom level of child ADHD and ODD in preschool-aged children. This study also contributes to the growing body of research on how adult ADHD manifests in the parenting domain and treatment setting by exploring how adult ADHD is related to parent interaction style, a major focus of parent training interventions for child ADHD and disruptive behavior. Finally, a methodological strength of this paper is the inclusion of multiple psychometrically sound rating scale measures to explore how results vary based on the measure used. The inconsistency in results found in this paper suggests that researchers must consider the measure that was used when comparing findings in different studies.

The preliminary results in this study are promising, and it will be important to continue to collect data to reexamine the study questions with a larger sample. Based on these results, we predict that upon reanalysis with CFA, factors related to adult inattention but not adult hyperactivity will be related to child ADHD expression and ODD behaviors. We also predict that factors related to inattention will remain consistently related to aspects of mother behavior such as maternal impatience during CLP. The inclusion of non-clinic referred children and their mothers will also contribute more range in the measurement of child ADHD, which may reduce some of the inconsistency in results and will allow for greater generalizability of the findings.

In conclusion, this study offers important implications for family-based treatment of child ADHD. The child’s mother is a critical member of the family unit, and better understanding of her potential ADHD symptomatology will allow for more effective treatment. By exploring how
adult ADHD is related to child disruptive behavior and affects the parent-child interaction, the therapist may tailor treatment to focus support on behaviors specific to parents with adult ADHD, leading to more effective treatment of families in which both the parent and the child are experiencing ADHD symptomatology.
REFERENCES


BIOGRAPHICAL SKETCH

Alison Rebecca Zisser was born in Jacksonville, Florida, on February 17, 1983. The younger of two children, she was raised in Jacksonville and graduated from the Bolles School in 2001. She earned her B.A. in psychology and history and graduated magna cum laude from Washington University in St. Louis in 2005.

Upon graduating, Alison spent five months in Durban, South Africa, working with HIV positive children and conducting research on AIDS prevention. After returning to the United States, Alison worked for six months as an early intervention therapist with developmentally delayed children. In August of 2006, she enrolled in a dual Master of Science and Doctor of Philosophy program at the University of Florida’s Department of Clinical and Health Psychology. Alison currently has a research assistantship in the Child Study Laboratory under the mentorship of Sheila Eyberg, Ph.D. Upon completion of her Master of Science, Alison will continue her Doctor of Philosophy work in the Department of Clinical and Health Psychology.