

Parental ADHD Symptomology and Ineffective Parenting: The Connecting Link of Home Chaos

By: Irina Mokrova, Marion O'Brien, Susan Calkins, and Susan Keane

Mokrova, I., O'Brien, M., Calkins, S., Keane, S. (2010). Parental ADHD symptomology and ineffective parenting: The connecting link of home chaos. *Parenting: Science and Practice, 10*(2), 119-135. DOI:10.1080/15295190903212844.

*****Note: This version of the document is not the copy of record. Made available courtesy of Taylor & Francis. Link to Journal: <http://www.tandfonline.com/toc/hpar20/current>**

Abstract:

Objective. This study examines links between maternal and paternal attention-deficit/hyperactivity disorder (ADHD) symptoms and parenting practices that require inhibition of impulses, sustained attention, and consistency; the role of home chaos in these associations is also assessed.

Design. ADHD symptoms, the level of home chaos, and parenting practices (e.g., involvement, inconsistent discipline, supportive and nonsupportive responses to children's negative emotions, and positive parenting) were assessed through self-reports of 311 mothers and 149 fathers of middle-childhood children. Teachers assessed the child ADHD symptoms.

Results. Mothers reported higher home chaos when they or their children had higher levels of ADHD symptoms; for fathers, only their own ADHD symptoms predicted higher levels of home chaos. Mothers' ADHD symptoms were positively associated with inconsistent discipline and nonsupportive responses to children's negative emotions, and these associations were mediated by home chaos. Higher levels of fathers' ADHD symptoms predicted more inconsistent discipline, low involvement, and a low level of supportive and a high level of nonsupportive responses to children's negative emotions. Home chaos moderated the link between paternal ADHD and inconsistent discipline and mediated the link between paternal ADHD and involvement. Overall, positive aspects of parenting, and those that require attention and ability to control one's impulses, may be compromised in fathers with high levels of ADHD symptoms.

Conclusions. Effectiveness of specific parenting practices for both mothers and fathers may be compromised in parents with ADHD symptoms. In certain cases, parental ADHD symptoms translate into ineffective parenting through disorganized homes.

Article:

INTRODUCTION

Parenting is a complex task that involves patience, attention, planning, and problem solving. The importance of these basic cognitive skills has been generally overlooked in models of the determinants of parenting in favor of social and emotional characteristics of parents (e.g., Belsky, 1984) and environmental factors (e.g., McLoyd, 1998). Yet, it is clear that effective parenting requires cognitive skills such as (1) the inhibition of immediate responses to attain long-term goals, (2) the ability to focus attention on a child and keep track of the child's activities despite the many distractions of everyday adult life, and (3) higher-order planning and

problem-solving skills that contribute to maintenance of an organized and appropriate environment for child rearing.

Deficits in these types of cognitive skills are included in the criteria for diagnoses of attention-deficit/hyperactivity disorder (ADHD; Willcutt, Doyle, Nigg, Faraone, & Pennington, 2005), suggesting that adults with diagnoses of ADHD or those who experience symptoms of ADHD in a nonclinical range may have considerable difficulty with parenting. Although until recently considered a disorder limited to childhood, ADHD is now known to persist into adulthood in 30% to 50% of individuals diagnosed as children (Murphy & Barkley, 1996a). Few researchers have considered the broader implications for family members when a partner or a parent has ADHD. There is some evidence that separation and divorce rates are high for couples in which one partner has ADHD (Biederman et al., 1993; Murphy & Barkley, 1996a). In addition, results of the few studies that have examined parents with ADHD show clear links with ineffective parenting and related child problems. For example, parents diagnosed with ADHD tend to be lax and inconsistent in enforcing limits with their children, possibly because of the attentional demands of monitoring child behavior and providing consistent consequences (Murray & Johnston, 2006). Among fathers who were highly involved with their children, those with symptoms of ADHD were found to be harsher in their parenting than those with no ADHD symptomology (Arnold, O'Leary, & Edwards, 1997); again, this link may relate to an inability to inhibit negative responses, especially over long periods of time. Mothers with ADHD are also reported to develop few household routines and be relatively unaware of their children's activities (Weiss, Hechtman, & Weiss, 2000). Despite these limitations in parenting skills, mothers with ADHD are found to be equally positive and, in fact, empathic in responding to their children when compared with mothers without ADHD (Murray & Johnston, 2006; Psychogiou, Daley, Thompson, & Sonuga-Barke, 2007). The difficulties that parents with ADHD symptoms appear to have are not in their affective ties or displays of warmth but in their ability to organize the home environment, attend closely to their children's behavior, and respond thoughtfully and consistently to their children. Thus, in the present study, we focus on three specific aspects of parenting—monitoring, inconsistent discipline, and involvement—that we expect to be compromised in parents who experience symptoms of ADHD, and we focus on one aspect—positive parenting—that we expect not to differ in parents with ADHD symptoms compared with typical parents.

In the present study, we also examine another specific dimension of parenting: response to child negative emotions. Providing support in situations in which children experience negative affect is expected to be a particularly difficult task for parents who have ADHD symptoms. Children's negative emotions tend to elicit reactive parental negativity (Martin, Clements, & Crnic, 2002). To respond sensitively and help children learn from negatively charged experiences, parents must inhibit their initial negative reaction in favor of a supportive and encouraging response. We examined parental supportive and nonsupportive responses to child negative emotions as important components of effective parenting that are likely to be linked to the presence of ADHD symptoms in parents.

The Role of Home Chaos

Home chaos refers to an environment that is high in background noise and crowding and that is low in structural and temporal routine (Corapci & Wachs, 2002). An orderly and regulated home

contributes to the well-being of both parents and children. Research indicates that family environments high in chaos increase parental negative responses, lower parental involvement in family activities, and reduce engagement in developmentally facilitative interactions with children (Corapci & Wachs, 2002; Evans, Maxwell, & Hart, 1999). Valiente, Lemery-Chalfant, and Reiser (2007) found home chaos to be negatively associated with parents' supportive reactions to children's negative emotions and parents' effortful control, which includes attention, activation, and inhibition. For children, lack of routine and structure are related to externalizing behaviors (Valiente et al., 2007) and lower levels of social and cognitive competence (Dumas, LaFreniere, & Serketich, 1995). Furthermore, research indicates that household chaos is a useful construct in itself, not just a proxy for adverse demographic factors (Dumas et al., 2005), and it is related to child problem behavior beyond socioeconomic status and parenting (Coldwell, Pike, & Dunn, 2006)

On the basis of evidence that mothers with ADHD develop few household routines (Weiss et al., 2000) and that parental effortful control (including attention and inhibition of immediate responses) is negatively associated with home chaos (Valiente et al., 2007), we examined the link between parental ADHD symptoms and home chaos and also the extent to which home chaos mediates the relation between parental ADHD symptoms and effective parenting. It is our hypothesis that parents with ADHD symptoms are less likely to follow through with household chores, establish and maintain routines, and keep track of family activities, thus creating a more chaotic home environment. In turn, elevated levels of home chaos interfere with effective parenting practices. An alternative possibility is that high levels of household chaos exacerbate the associations between parental ADHD symptomology and ineffective parenting. Thus, we ask whether parental ADHD symptoms translate into ineffective parenting through a disordered and chaotic household, or whether a disordered home environment intensifies the links between parental ADHD symptoms and negative parenting.

Parenting in Mothers and Fathers

Emerging research evidence suggests that the parenting of mothers and fathers is similar in some respects but different in others (Parke, 2002). Mothers and fathers are similar in overall expression of emotion and in quantity of positive interactions with their children (e.g., McDowell, Kim, O'Neil, & Parke, 2002), but mothers tend to be more supportive when children are upset, sad, or angry (Eisenberg, Fabes, & Murphy, 1996; McElwain, Halberstadt, & Volling, 2007). Mothers and fathers may also differ in their parenting cognitions and attributions of children's noncompliance (Hoza et al., 2000). Thus, the present study examines ADHD symptoms and parenting in both mothers and fathers.

Clinical and Nonclinical ADHD in Adults and Children

Previous research has tended to focus on parents with full-fledged ADHD diagnoses. Some clinicians, however, have described ADHD symptoms as falling at the extreme end of the continuum of typical behavioral traits (Murphy & Barkley, 1996b). In this view, the deficits in attentional focus or behavioral inhibition included among the diagnostic criteria for ADHD are best understood as quantitatively—but not qualitatively—different from the same traits in the general population. Because a diagnosis of ADHD requires the presence of at least six characteristics of the disorder for inattentive type or hyperactive-impulsive type (American Psychiatric Association, 2000), individuals may have significant dysfunction but still not reach

criteria for a clinical diagnosis. The present study included individuals from a community sample who experience subclinical symptoms of ADHD to examine the potential role of parental ADHD symptomology in parenting effectiveness. We also included both fathers and mothers to expand our understanding of family functioning when either parent has ADHD symptoms. Because there may be differences in parenting as a function of family composition, we controlled for two-parent versus single-parent families in the analyses of mothers. Because child ADHD symptoms are known to affect parenting (Johnston, Murray, Hinshaw, Pelham, & Hoza, 2002), we controlled for child ADHD as well.

Study Hypotheses

We examined the following specific hypotheses: (1) parents with higher ADHD symptoms report higher levels of home chaos; (2) parents with higher ADHD symptoms report more ineffective parenting behaviors, such as low monitoring, inconsistent discipline, lack of involvement, and nonsupportive responses to child negative emotions, but parental ADHD symptoms are not related to reports of positive parenting; and (3) home chaos mediates the link between parental ADHD symptoms and parenting effectiveness. Because living in a chaotic home environment may exacerbate the links between parental ADHD symptoms and parenting, we also tested the moderating model as an alternative to the last hypothesis.

METHOD

Participants

Families participating in this study were part of a larger longitudinal project designed to identify early indicators of behavioral problems in young children. For the larger project, we recruited families through childcare centers, the County Health Department, and the local Women, Infant, and Children program in a southeastern area of the United States. The recruitment process occurred in two stages when focal children of participating families were 2 years of age: one group was born during 1995–1996, and the other group was born in 1998. The aim of the recruitment process was to attain a sample representative of the surrounding counties in terms of ethnicity and socioeconomic status (SES). As such, our sample was a community sample, not a clinical one. We collected the data used in the present report at the same time point (2005–2006) for all 319 families remaining in the project (with an attrition rate of 27% over 8 years); thus, 213 families had a 7-year-old child, and 106 had a 10-year-old child. In this sample, 72% were two-parent households; 67% were European American (coded “1”), and 33% of ethnic minority (coded “2”). Slightly more than half (55%) of participating families had a girl (coded “2”; boys were coded “1”) as the focal child. Of the mothers, 38% had less than a college education. According to the Hollingshead (1975) Four-Factor Index of Social Status, 49% were in nonprofessional occupations and 51% were in professional occupations. Comparison of the demographic characteristics of the participating families with those who discontinued participation showed no differences in terms of ethnicity, marital status, or SES. There was, however, a difference in child gender, $t(445) = 2.19, p = .029$; a higher proportion of families with girls continued participation in the project.

Mothers were the primary caregivers in all but two of the participating families; fathers were primary caregivers in these two families (one family with a stepmother and one as a single parent household). Of the 228 two-parent families, 149 fathers (65%) participated in the study. There were no significant differences between families with participating and nonparticipating fathers

in terms of family SES, but there were differences by child gender, $t(226) = 2.15, p = .03$; and by ethnicity, $t(226) = 2.06, p = .04$. Of nonparticipating fathers, 60% had a girl as a focal child, and 30% were ethnic minority. Of participating fathers, 46% had a girl as a focal child, and 20% were ethnic minority.

Participants who were missing two or more questionnaires from all analyses, thus reducing the number of participating mothers to 311, and the number of families in which information was available for both mothers and fathers to 147. Classroom teacher reports were used to assess children's ADHD symptomology and were available for 253 children. There were no significant differences in child gender or ethnicity for available and unavailable teacher reports of child ADHD symptoms. The total amount of missing data was 1.7% for mothers, 0.7% for fathers, and 19.2% for teachers. ¹ Missing data were replaced by scale means for categorical data and imputed using the maximum likelihood estimation method, implemented by the EM algorithm, for ordinal scales.

Procedure

During a laboratory visit, while children were engaged in activities as a part of the larger study, mothers completed questionnaires regarding family demographics, their own ADHD symptoms, perceived level of routine and structure in the home, and aspects of parenting practices such as monitoring, involvement, discipline, overall positive parenting, and responses to children's negative emotions. At the end of the visit, a questionnaire packet with a stamped return envelope was given to the mothers to be completed by fathers and mailed back to the research team. The questionnaires included self-reported father ADHD symptoms, perceived level of routine and structure in the home, and the same aspects of parenting practices as completed by the mothers.

Measures

Demographics. We collected all demographic information by mother report.

Maternal and paternal ADHD symptoms. We measured mothers' and fathers' ADHD symptoms using the Adult ADHD Rating Scale-IV (Murphy & Barkley, 1996a), a self-report measure that yields an overall ADHD severity index and has been shown in previous research to correlate with clinical ADHD assessments (Murphy & Barkley, 1996b). The scale consists of 18 items assessing difficulties with inhibition of immediate responses, sustaining attention, planning, and problem solving. Each item is rated on a 4-point scale ranging from 0 (*rarely/never*) to 3 (*very often*), on the basis of behavior in the past 6 months. We calculated total scores by summing the individual item scores; the possible range is 0 to 54. Cronbach's alphas were .90 for mothers and .87 for fathers. It is important to note that in this community sample, as expected, few parents (3% of participating mothers and 2% of fathers) reached the clinical cutoffs for ADHD diagnosis. The measure of parental ADHD symptoms was used as a continuous variable reflecting the degree of symptom presentation, not as a categorical variable identifying diagnostic categories.

Home chaos. We assessed the level of routine and structure in the home through the Confusion, Hubbub, and Order Scale (Matheny, Wachs, Ludwig, & Phillips, 1995) that was administered to both mothers and fathers. Participants either agreed or disagreed with 15 statements describing life in their home; one such statement was "We can usually find things when we need them."

After reflecting the items describing orderliness, a total score (range = 0–15) was calculated; higher scores indicate more chaotic home settings. Cronbach's alphas were .82 for mothers and .83 for fathers.

Parenting practices. We assessed parenting practices using two measures. We used the Alabama Parenting Questionnaire (Shelton, Frick, & Wootton, 1996) to assess monitoring, inconsistent discipline, parental involvement, and positive parenting. Each item was rated on a 5-point scale ranging from 1 (*never*) to 5 (*always*) to represent typical frequency in the home. Scores were calculated as means for each of the subscales. The monitoring subscale consisted of 10 items (e.g., “Your child is out with friends you do not know.”) with Cronbach's $\alpha = .56$ for mothers and $\alpha = .59$ for fathers; inconsistent discipline included 6 items (e.g., “The punishment you give your child depends on your mood.”), with Cronbach's $\alpha = .70$ for mothers and $\alpha = .71$ for fathers; involvement included 10 items (e.g., “You talk to your child about his/her friends.”) with Cronbach's $\alpha = .72$ for mothers and $\alpha = .81$ for fathers; and positive parenting subscale included 6 items (e.g., “You compliment your child when he/she does something well.”) with Cronbach's $\alpha = .79$ for mothers and $\alpha = .78$ for fathers. Because of low levels of internal reliability, the monitoring subscale was excluded from the analysis.

We used the Coping with Children's Negative Emotions Scale (Fabes, Eisenberg, & Bernzweig, 1990) to measure parental responses to children's negative affect. The scale consists of 12 hypothetical scenarios in which the child is described as upset or angry. On a 7-point Likert-type scale ranging from 1 (*very unlikely*) to 7 (*very likely*), parents rate how likely they would be to express six different types of reactions in response to their children's negative emotions. Following previous work (Eisenberg & Fabes, 1994; Fabes, Poulin, Eisenberg, & Madden-Derdich, 2002), the responses were aggregated into two subscales: supportive responses (including encouraging emotional expressiveness, emotion-focused coping, and problem-focused reactions) and nonsupportive responses (including distress, minimization, and punitive reactions). Cronbach alphas for supportive responses were .93 for mothers and .94 for fathers, and those for nonsupportive responses were .84 for mothers and .81 for fathers.

Child ADHD symptoms. We used the ADHD Rating Scale-IV: School Version (DuPaul, Power, Anastopoulos, & Reid, 1998), completed by teachers, to assess children's ADHD symptoms. This measure is based on the diagnostic criteria for ADHD (DSM-IV; American Psychiatric Association, 2000) and was standardized and used in previous research (DuPaul, Anastopoulos, et al., 1998; Power, Costigan, Leff, Eiraldi, & Landau, 2001). The scale consists of 18 items describing symptoms, such as “has difficulty sustaining attention in tasks or playing activities.” Each item is rated on a 4-point Likert-type scale ranging from 0 (*rarely/never*) to 3 (*very often*), on the basis of children's behavior in the last 6 months. Total scores were calculated by summing individual item scores; the possible range is 0 to 54. Cronbach α for the present sample was .96.

RESULTS

Preliminary Analyses

We ran a series of *t* tests to determine whether there were differences by child age in any of the study measures. We found no statistically significant differences, and therefore, we conducted the analyses for the entire group. Correlational analyses indicated relations with study variables

for child gender and ethnicity; thus, these factors were controlled in all analyses. Descriptive data on study variables for mothers and fathers, and the correlations for measures completed by both mothers and fathers within the same families, are shown in Table 1

Table 1: Descriptive Data for Study Variables for Mothers and Fathers

Measure and Variable	Mothers (<i>n</i> = 311)		Fathers (<i>n</i> = 149)		Mother–Father Correlations (<i>n</i> = 147)
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>R</i>
Attention-Deficit/Hyperactivity Disorder symptoms	6.34	6.55	8.07	6.30	.10
Home chaos	3.33	3.09	2.93	2.98	.51**
Alabama Parenting Questionnaire					
Inconsistent discipline	2.03	.53	2.11	.52	.32**
Involvement	4.21	.39	3.81	.45	.13
Positive parenting	4.33	.45	4.10	.45	.23**
Coping with Children’s Negative Emotions Scale					
Supportive responses to children’s negative emotions	5.68	.75	5.24	.82	.18*
Nonsupportive responses to children’s negative emotions	2.28	.65	2.60	.55	.18*

p* < .05. *p* < .01.

Mothers’ and fathers’ reports of disorganization in the home were significantly correlated as were most of the parenting variables. Zero-order correlations between study measures for mothers and for fathers, as well as child ADHD symptoms, are shown in Table 2. Correlations were in the expected direction, and, as predicted, parents with higher ADHD symptoms reported more negative parenting in general.

Table 2: Correlations Between Study Variables for Mothers and Fathers

Variable	1	2	3	4	5	6	7	8
1. Child ADHD symptoms	—	.03	.16**	.15**	-.04	.00	-.04	.17**
2. Parent ADHD symptoms	-.03	—	.46**	.21**	-.11*	-.09	-.11	.23**
3. Home chaos	.06	.43**	—	.28**	-.15*	-.06	-.12*	.30**
4. Inconsistent discipline	.04	.38**	.40**	—	-.22**	-.06	-.12*	.27**
5. Involvement	-.11	-.23**	-.32**	-.29**	—	.58**	.36*	-.15*
6. Positive parenting	-.11	-.16	-.11	-.24**	.67**	—	.28**	-.03
7. Supportive response to child negative emotions	-.05	-.26**	-.19*	-.25**	.45**	.52**	—	.01
8. Nonsupportive response to child negative emotions	.01	.28**	.10	.21**	-.17*	-.18	-.34**	—

Note. Correlations for mothers appear above the diagonal; correlations for fathers appear below the diagonal. Child ADHD symptoms are those reported by teacher. ADHD = Attention-Deficit/Hyperactivity Disorder.

p* < .05. *p* < .01.

Relation Between Parental ADHD Symptoms and Home Chaos

Hierarchical linear regression analyses were run separately for mothers and for fathers to examine relations between parental ADHD symptoms and their reports of home chaos, controlling for child gender, ethnicity, and child ADHD symptoms and for family composition (single-parent status versus two-parent status) in the analysis for mothers. Results are shown in Table 3. For mothers, the block of control variables was significant, and inspection of univariate results indicated that child ADHD symptoms contributed significantly to mothers’ report of chaos in the home (4% of total variance). Mothers’ own ADHD symptoms were also significantly related to their reports of home chaos beyond the controls, accounting for 20% of the variance. The analyses for fathers showed that only fathers’ own ADHD symptoms were related to their report of home chaos and accounted for 18% of the variance.

Table 3: Regression Analyses Examining the Relation Between Parental ADHD Symptoms and Parents' Reports of Home Chaos

Variable	Mothers (<i>n</i> = 311)				Fathers (<i>n</i> = 149)			
	<i>B</i>	<i>SE</i>	β	ΔR^2	<i>B</i>	<i>SE</i>	β	ΔR^2
Step 1				.04*				.03
Child gender	.46	.33	.07		.53	.47	.09	
Ethnicity	-.06	.25	-.01		-.43	.37	-.09	
Two-parent family	-.36	.39	-.05					
Child ADHD symptoms	.04	.02	.15**		.03	.03	.10	
Step 2				.20***				.18***
Parent ADHD symptoms	.22	.02	.46***		.20	.04	.43***	

Note. For mothers, final model was as follows: adjusted $R^2 = .23$, $F(5, 305) = 19.10$, $p < .001$; for fathers, final model was as follows: adjusted $R^2 = .18$, $F(4, 144) = 7.61$, $p < .001$. ADHD = Attention-Deficit/Hyperactivity Disorder.

* $p < .05$. ** $p < .01$. *** $p < .001$.

The models were ran again including only the subsample of families in which both parents participated to determine whether the spouse's ADHD symptoms contributed to parent report of home chaos beyond his or her own ADHD symptoms. For mothers, father ADHD symptoms accounted for a small but significant portion of variance, $\beta = .18$, $p < .05$, contributing an additional 2%. Mother ADHD was not significant in the father analyses. Thus, for mothers, not only her own ADHD symptoms but those of her child and her partner contributed to a sense of disorganization and disorder in the home environment. For fathers, by contrast, neither their child's nor their wife's ADHD symptoms contributed to their perception of chaos in the home environment.

Parental ADHD Symptoms and Parenting Effectiveness

We used hierarchical regression analyses to examine the relation between parental ADHD symptoms and indicators of effective parenting: inconsistent discipline, parental involvement, positive parenting, and supportive and nonsupportive responses to child negative emotions. Our hypotheses were that parental ADHD symptoms would be related to indices of negative parenting effectiveness but not positive aspects of parenting, and that home chaos would mediate the relation between parental ADHD symptoms and parenting variables, as indicated by a decrease in the beta for parental ADHD symptoms when home chaos was added to the model (Baron & Kenny, 1986). We also examined an alternative hypothesis of home chaos as a moderator in the link between parents' ADHD symptoms and their parenting effectiveness by including in the final step of the regression analyses the interaction term between parental ADHD symptoms and home chaos. All analyses were run controlling for child gender, ethnicity, and ADHD symptoms; family composition (single-parent family versus two-parent family) was added as a control in the mother analyses.

Analyses for mothers indicated significant relations between maternal ADHD symptoms and parenting for two of the five parenting effectiveness variables: inconsistent discipline and nonsupportive responses to child negative emotions. As anticipated, there were no relations between ADHD symptoms of mothers and positive aspects of their parenting. Results for inconsistent discipline and nonsupportive responses are shown in Tables 4 and 5.

Table 4: Regression Analyses Examining Home Chaos as a Mediator and Moderator of the Relation Between Mothers' ADHD Symptoms and Reports of Parenting: Inconsistent Discipline

Variable	Model 1			Model 2			Model 3			ΔR^2
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	
Step 1										0.04*
Child gender	-.04	.06	-.04	-.06	.06	-.05	-.05	.06	-.05	
Ethnicity	-.01	.05	-.02	-.01	.05	-.02	-.01	.05	-.01	
Two-parent family	-.13	.07	-.11	-.12	.07	-.10	-.11	.07	-.09	
Child ADHD symptoms	.01	.00	.13**	.00	.00	.09	.00	.00	.09	
Step 2										.04***
Mother ADHD symptoms	.02	.01	.20***	.01	.01	.10	.01	.01	.15	
Step 3										.03***
Home chaos	—	—	—	.04	.01	.21***	.04	.01	.22***	
Step 4										.00
Mother ADHD \times Chaos	—	—	—	—	—	—	-.00	.00	-.08	

Note. For Model 3, adjusted $R^2 = .10$, $F(7, 303) = 5.60$, $p < .001$. ADHD = Attention-Deficit/Hyperactivity Disorder.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Model 1 in Tables 4 and 5 shows that mothers' ADHD symptoms were positively and significantly related to inconsistent discipline and to nonsupportive responses to child negative emotions beyond the effects of child ADHD symptoms. Mothers who reported more ADHD symptoms also reported being more inconsistent in their discipline and using more nonsupportive responses to children's negative emotions. In Model 2, with the introduction of home chaos, maternal ADHD symptoms decreased, indicating that home chaos mediates the link between mothers' ADHD symptoms and parenting behavior. Results of the Sobel test of indirect effects confirms the significance of these mediation paths; for inconsistent discipline, the Sobel test statistic is 4.60, $p < .001$, and for nonsupportive responses, it is 4.84, $p < .001$. The interaction between mothers' ADHD symptoms and home chaos (Model 3) was not significant for any of the parenting variables. Higher levels of maternal ADHD were associated with inconsistent discipline and nonsupportive responses to child negative emotions through home chaos. The overall models account for relatively small (10% in both cases) but significant amounts of the variance in mothers' parenting behavior.

Table 5: Regression Analyses Examining Home Chaos as a Mediator and Moderator of the Relation Between Mothers' ADHD Symptoms and Reports of Parenting: Nonsupportive Response to Child Negative Emotions

Variable	Model 1			Model 2			Model 3			ΔR^2
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	
Step 1										.04*
Child gender	.08	.08	.06	.06	.07	.04	.06	.07	.04	
Ethnicity	-.01	.06	-.01	-.01	.06	-.01	-.01	.06	-.01	
Two-parent family	-.09	.09	-.06	-.07	.09	-.05	-.07	.09	-.05	
Child ADHD symptoms	.01	.00	.17**	0.01	.00	.13*	.01	.00	.13*	
Step 2										.05***
Mother ADHD symptoms	.02	.01	.22***	.01	.01	.12*	.01	.01	.13	
Step 3										.04***
Home chaos	—	—	—	.05	.01	.22***	.05	.01	.22***	
Step 4										.00
Mother ADHD \times Chaos	—	—	—	—	—	—	.00	.00	-.02	

Note. For Model 3, adjusted $R^2 = .10$, $F(7, 303) = 6.02$, $p < .001$. ADHD = Attention-Deficit/Hyperactivity Disorder.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Fathers' ADHD symptoms were significantly related to four of the five aspects of parenting behavior examined: inconsistent discipline, involvement, and both supportive and nonsupportive responses to child negative emotions. Only the construct of positive parenting was not associated with paternal ADHD symptoms. Results for fathers are shown in 6–9

Table 6: Regression Analyses Examining Home Chaos as a Mediator and Moderator of the Relation Between Fathers' ADHD Symptoms and Reports of Parenting: Inconsistent Discipline

Variable	Model 1			Model 2			Model 3			ΔR^2
	B	SE B	β	B	SE B	β	B	SE B	β	
Step 1										.01
Child gender	-.01	.08	-.01	-.04	.08	-.04	-.06	.08	-.05	
Ethnicity	.02	.07	.03	.05	.06	.06	.05	.06	.06	
Child ADHD symptoms	.00	.01	.05	.00	.01	.01	.00	.00	-.01	
Step 2										.14***
Father ADHD symptoms	.03	.01	.39***	.02	.01	.26**	.03	.01	.31***	
Step 3										.07***
Home chaos	—	—	—	.05	.01	.30***	.06	.02	.34***	
Step 4										.03*
Father ADHD \times Chaos	—	—	—	—	—	—	-.00	.00	-.19*	

Note. For Model 3, adjusted $R^2 = .22$, $F(6, 142) = 7.91$, $p < .001$. ADHD = Attention-Deficit/Hyperactivity Disorder.
 * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 7: Regression Analyses Examining Home Chaos as a Mediator and Moderator of the Relation Between Fathers' ADHD Symptoms and Reports of Parenting: Involvement

Variable	Model 1			Model 2			Model 3			ΔR^2
	B	SE B	β	B	SE B	β	B	SE B	β	
Step 1										.09**
Child gender	-.04	.07	-.04	-.02	.07	-.02	-.01	.07	-.01	
Ethnicity	.17	.06	.24**	.16	.06	.22**	.16	.06	.21**	
Child ADHD symptoms	-.01	.04	-.15	-.01	.00	-.12	-.01	.00	-.11	
Step 2										.04*
Father ADHD symptoms	-.01	.01	-.20*	-.01	.01	-.10	-.01	.01	-.14	
Step 3										.04**
Home chaos	—	—	—	-.04	.01	—	-.04	.01	-.26**	
						.24**				
Step 4										.01
Father ADHD \times Chaos	—	—	—	—	—	—	.00	.00	.12	

Note. For Model 3, adjusted $R^2 = .14$, $F(6, 142) = 5.16$, $p < .001$. ADHD = Attention-Deficit/Hyperactivity Disorder.
 * $p < .05$. ** $p < .01$.

Table 8: Regression Analyses Examining Home Chaos as a Mediator and Moderator of the Relation Between Fathers' ADHD Symptoms and Reports of Parenting: Supportive Response to Child Negative Emotions

Variable	Model 1			Model 2			Model 3			ΔR^2
	B	SE B	β	B	SE B	β	B	SE B	β	
Step 1										.05
Child gender	.14	.14	.09	.15	.14	.10	.16	.14	.10	
Ethnicity	.19	.11	.14	.18	.11	.14	.18	.11	.13	
Child ADHD symptoms	-.00	.01	-.05	-.00	.01	-.04	-.00	.01	-.03	
Step 2										.05**
Father ADHD symptoms	-.03	.01	-.22**	-.02	.01	-.19*	-.03	.01	-.21*	
Step 3										.01
Home chaos	—	—	—	-.02	.02	-.08	-.03	.03	-.10	
Step 4										.01
Father ADHD \times Chaos	—	—	—	—	—	—	.00	.00	.09	

Note. For Model 3, adjusted $R^2 = .07$, $F(6, 142) = 3.30$, $p < .01$. ADHD = Attention-Deficit/Hyperactivity Disorder.
 * $p < .05$. ** $p < .01$.

Table 9: Regression Analyses Examining Home Chaos as a Mediator and Moderator of the Relation Between Fathers' ADHD Symptoms and Reports of Parenting: Nonsupportive Response to Child Negative Emotions

Variable	Model 1			Model 2			Model 3			ΔR^2
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	
Step 1										.03
Child gender	-.04	.09	-.04	-.04	.09	-.04	-.05	.09	-.05	
Ethnicity	-.08	.07	-.09	-.08	.07	-.09	-.08	.07	-.09	
Child ADHD symptoms	.00	.01	.01	.00	.01	.02	.00	.01	-.00	
Step 2										.06**
Father ADHD symptoms	.02	.01	.26**	.02	.01	.27**	.03	.01	.33***	
Step 3										.00
Home chaos	—	—	—	-.01	.02	-.03	.00	.02	.01	
Step 4										.03
Father ADHD × Chaos	—	—	—	—	—	—	-.00	.00	-.18	

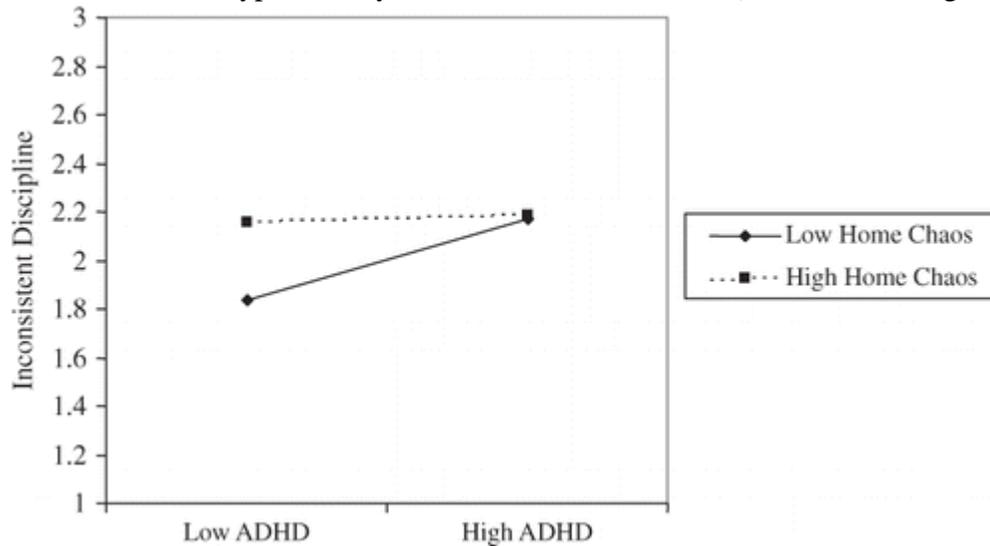
Note. For Model 3, adjusted $R^2 = .08$, $F(6, 142) = 3.07$, $p < .01$. ADHD = Attention-Deficit/Hyperactivity Disorder. ** $p < .01$. *** $p < .001$.

Father ADHD symptoms were positively and significantly linked to inconsistent discipline (Model 1 in Table 6). Home chaos also contributed significantly in predicting inconsistent discipline, but entering home chaos (Model 2 in Table 6) did not significantly reduce the beta for fathers' ADHD symptoms. Thus, home chaos did not mediate the relation between father ADHD symptoms and inconsistent discipline for fathers. When fathers reported higher ADHD symptoms and more chaos at home, they also reported being inconsistent in their discipline. Father ADHD symptoms were also significantly related to father involvement; fathers with more ADHD symptoms were less involved with their children. Entering home chaos into the model (Model 2 in Table 7) reduced the beta for father ADHD symptoms to a nonsignificant level, suggesting that home chaos mediates the link between father ADHD symptoms and involvement. The Sobel test to indicate the significance of an indirect effect yielded a significant result of 3.29, $p < .001$.

Results for supportive and nonsupportive responses to child negative emotions were similar and complementary. Fathers with higher ADHD symptoms reported lower supportive responses and higher nonsupportive responses. Home chaos was not significantly associated with either supportive or nonsupportive responses and did not serve as a mediator. The amount of variance accounted for in these models was low (7% and 8%, respectively) but significant.

The interaction term between father ADHD symptoms and home chaos was tested for each of the parenting variables (Model 3) and was significant only for inconsistent discipline. The simple slopes depicting this interaction are shown in Figure 1. When home chaos was high, there was no relation between fathers' ADHD symptoms and inconsistent discipline (simple slope = 0.014, $p = .16$), but when home chaos was low, father ADHD symptoms were significantly linked to inconsistent discipline (simple slope = 0.026, $p = .01$). Under conditions of high home chaos, fathers, on average, report relatively high levels of inconsistent discipline. When home chaos is low, only those fathers who have higher levels of ADHD symptoms are inconsistent in their discipline.

Figure 1: Fathers' inconsistent discipline, as predicted by two-way interaction between paternal Attention-Deficit/Hyperactivity Disorder and home chaos (low = -1 SD, high = $+1$ SD)



DISCUSSION

This study examined associations between parental ADHD symptomology, level of home chaos, and ineffective parenting behaviors as reported by mothers and fathers of school-age children. Findings suggest that parenting practices requiring inhibition of immediate responses and the ability to focus attention on a child may be compromised in parents with ADHD symptoms at non-clinical levels. Consistent with our hypotheses, parents who experienced higher levels of ADHD symptoms also reported greater disorganization and disorder in the home. For mothers, ratings of home chaos were linked to the presence of ADHD symptoms in any family member—herself, her spouse, or her child. For fathers, only their own ADHD symptomology was related to their perception of household chaos.

Results held for both mothers and fathers. Mothers with higher levels of ADHD symptoms were more likely to report inconsistency in imposing limits with their children, supporting earlier findings that parents diagnosed with ADHD tend to be lax and inconsistent in discipline (Murray & Johnston, 2006). Mothers with more ADHD symptoms also reported a higher frequency of nonsupportive responses—becoming distressed, minimizing children's distress, or punishing their children—to their children's negative emotions. As predicted, we did not find a relation between maternal ADHD symptoms and positive aspects of parenting. These findings are consistent with previous reports (Murray & Johnston; Psychogiou et al., 2007)

Although fathers showed similar patterns, our results suggest they may have more difficulties in parenting than mothers. In addition to inconsistent discipline and nonsupportive responses to children's negative emotions, fathers with ADHD symptoms reported lower levels of involvement with their children and lower rates of supportive responses to children's distress. The reason for these differences is not clear. Mothers in general tend to respond to child negative emotions more supportively than do fathers, and perhaps this difference is amplified when parents have ADHD symptoms. Mothers also may prioritize children's interests and attend to

children's needs above their own more often than do fathers. It may also be the case that fathers with ADHD symptoms also experience greater stress outside the family, thus compounding the negative effect on their parenting. Similar to mothers, fathers with ADHD symptoms did not report lower levels of positive parenting.

We found home chaos to play a role in the associations between parental ADHD and ineffective parenting. Living in a chaotic home environment seems to work as a mechanism through which maternal ADHD symptoms are translated into compromised parenting. Mothers with higher ADHD symptoms appear to have more difficulties in organizing a home environment that is conducive to effective parenting, and chaos in the home was linked to inconsistent discipline and nonsupportive responses to children's negative emotions. Home chaos also mediated the association between fathers' ADHD symptoms and their level of involvement with their children, and it moderated the association between fathers' ADHD symptoms and inconsistent discipline. Under conditions of high home chaos, fathers as a group reported relatively high levels of inconsistent discipline. However, when home chaos was low, only those fathers who had higher levels of ADHD symptoms were inconsistent in their discipline. Thus, living in a disorganized home appears to be linked to inconsistent discipline regardless of fathers' ADHD symptomology. Home chaos was a significant moderator only in this one case, however, and therefore replication of these findings is needed for further understanding of the relation between home chaos and parent ADHD symptoms.

The present study has several strengths and limitations. The inclusion of both parents addresses the need for further understanding of parenting practices in mothers and fathers. It has become clear that the mechanisms governing parenting in mothers and fathers differ from each other (Parke, 2002); however, parenting more often is studied in mothers only. By including both parents, the present study expands our understanding of overall family processes and shows different pathways through which parental ADHD symptoms may be linked to family life. The relatively large sample size of the present study allowed us to examine two-way interactions between the study variables and have more confidence in the results.

The main limitations of the study are shared method variance because of parents providing information about their ADHD symptomology, parenting, and perceived home chaos, as well as our reliance on self-reports rather than observational data. Although the measure of parental ADHD symptomology has been validated in prior research (Murphy & Barkley, 1996a), observational assessments of parenting practices may be more accurate than self-reports (Zaslow et al., 2006). Another limitation is the lack of ethnic diversity in the sample, especially for fathers, which made it impossible to examine the potential role of ethnic differences in these family processes and make our results generalizable to minority fathers. The present study extends our understanding of parenting behaviors in adults with ADHD symptoms and the difficulties they may be facing. The results show that parental ADHD symptoms are translated into ineffective parenting to some extent through a disorganized home environment. Although the treatment of clinically diagnosed ADHD may require more extensive intervention, the results of the present study suggest that parents with nonclinical levels of ADHD symptoms who make an extra effort in creating quiet and organized homes and implementing daily routines may help to buffer any negative effects of parents' ADHD symptoms on their parenting. It is also important for mental health specialists and other professionals who work with parents to be alert

to the potential links among adult ADHD symptoms, home organization, and parenting behavior. Teaching parents skills that will help them to create and maintain quiet and organized households could be an important step in alleviating possible negative effects of parental ADHD symptoms.

The present study focused on parenting practices of adults who exhibit ADHD symptoms. To maintain our focus, child ADHD symptoms were controlled in the analyses. However, recent research suggests that adult ADHD interacts with child ADHD such that mothers with ADHD are less negative in their parenting of children with ADHD than other mothers, whereas fathers with ADHD are more negative than other fathers (Psychogiou et al., 2007). Future research is needed to address the joint and unique contributions of parent and child ADHD symptoms to parenting practices. Furthermore, it will also be important to understand family dynamics when one or both parents have ADHD symptoms. It is evident that the presence of ADHD symptoms in parents, even in the subclinical range, influences the quality of parenting and the supportiveness of the home environment for child rearing. By understanding the link between parental ADHD symptoms and challenges in the parent role, professionals can better address specific challenges these families face.

ACKNOWLEDGEMENTS

This project was supported by Grant MH55144 from the National Institute of Mental Health. The authors express their gratitude to the participating families and to the research team of this project.

NOTES

¹Because of the substantial amount of missing data on teacher reports of child ADHD symptoms, all analyses were run with the reduced sample as well as with missing data imputed. We found no differences in results, and, therefore, the results for the full sample, with imputed data, are reported.

REFERENCES

- American Psychiatric Association. 2000. *Diagnostic and Statistical Manual of Mental Disorders*, 4th, Washington, DC: Author.
- Arnold, E. H., O'Leary, S. G. and Edwards, G. H. 1997. Father involvement and self-reported parenting of children with attention-deficit/hyperactivity disorder. *Journal of Consulting and Clinical Psychology*, 2: 337–342.
- Baron, R. M. and Kenny, D. A. 1986. The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51: 1173–1182.
- Belsky, J. 1984. The determinants of parenting: A process model. *Child Development*, 55: 83–96.
- Biederman, J., Faraone, S. V., Spencer, T., Wilens, T. E., Norman, D., Lapey, K. A. 1993. Patterns of psychiatric co-morbidity, cognition, and psychosocial functioning in adults

- with attention-deficit/hyperactivity disorder. *American Journal of Psychiatry*, 150: 1792–1798.
- Coldwell, J., Pike, A. and Dunn, J. 2006. Household chaos—Links with parenting and child behaviour. *Journal of Child Psychology and Psychiatry*, 47: 1116–1122.
- Corapci, F. and Wachs, T. D. 2002. Does parental mood or efficacy mediate the influence of environmental chaos upon parenting behavior?. *Merrill-Palmer Quarterly*, 48: 182–201.
- Dumas, J. E., LaFreniere, P. J. and Serketich, W. J. 1995. “Balance of power”: A transactional analysis of control in mother–child dyads involving socially competent, aggressive, and anxious children. *Journal of Abnormal Psychology*, 104: 104–113.
- Dumas, J. E., Nissley, J., Nordstrom, A., Phillips Smith, E., Prinz, R. J. and Levine, D. W. 2005. Home chaos: Sociodemographic, parenting, interactional, and child correlates. *Journal of Clinical Child and Adolescent Psychology*, 34: 93–104.
- DuPaul, G. J., Anastopoulos, A. D., Power, T. J., Reid, R., Ikeda, M. J. and McGoey, K. E. 1998. Parent ratings of attention-deficit/hyperactivity disorder symptoms: Factor structure and normative data. *Journal of Psychopathology and Behavioral Assessment*, 20: 83–102.
- DuPaul, G. J., Power, T. J., Anastopoulos, A. D. and Reid, R. 1998. *ADHD Rating Scale-IV: Checklists, norms, and clinical interpretation*, New York: Guilford Press.
- Eisenberg, N. and Fabes, R. A. 1994. Mothers’ reactions to children’s negative emotions: Relations to children’s temperament and anger behavior. *Merrill-Palmer Quarterly*, 40: 138–156.
- Eisenberg, N., Fabes, R. A. and Murphy, B. C. 1996. Parents’ reactions to children’s negative emotions: Relations to children’s social competence and comforting behavior. *Child Development*, 67: 2227–2247.
- Evans, G. W., Maxwell, L. E. and Hart, B. 1999. Parental language and verbal responsiveness to children in crowded homes. *Developmental Psychology*, 35: 1020–1023.
- Fabes, R. A., Eisenberg, N. and Bernzweig, J. 1990. *The Coping with Children’s Negative Emotions Scale: Procedures and scoring*, Tempe, AZ: Arizona State University.
- Fabes, R. A., Poulin, R. E., Eisenberg, N. and Madden-Derdich, D. A. 2002. The Coping with Children’s Negative Emotions Scale (CCNES): Psychometric properties and relations with children’s emotional competence. *Marriage and Family Review*, 34: 285–310.
- Hollingshead, A. B. 1975. *Four-Factor Index of Social Status*, New Haven, CT: Unpublished manuscript.

- Hoza, B., Owens, J. S., Pelham, W. E., Swanson, J. M., Conners, C. K., Hinshaw, S. P. 2000. Parent cognitions as predictors of child treatment response in attention-deficit/hyperactivity disorder. *Journal of Abnormal Child Psychology*, : 569–583.
- Johnston, C., Murray, C., Hinshaw, S. P., Pelham, W. E. Jr and Hoza, B. 2002. Responsiveness in interactions of mothers and sons with ADHD: Relations to maternal and child characteristics. *Journal of Abnormal Child Psychology*, 30: 77–88.
- Martin, S. E., Clements, M. L. and Crnic, K. A. 2002. Maternal emotions during mother–toddler interaction: Parenting in an affective context. *Parenting: Science and Practice*, 2: 105–126. [Taylor & Francis Online], [Web of Science ®]
- Matheny, A. P., Wachs, T. D., Ludwig, J. L. and Phillips, K. 1995. Bringing order out of chaos: Psychometric characteristics of the confusion, hubbub, and order scale. *Journal of Applied Developmental Psychology*, 16: 429–444.
- McDowell, D. J., Kim, M., O’Neil, R. and Parke, R. D. 2002. Children’s emotional regulation and social competence in middle childhood: The role of maternal and paternal interactive style. *Marriage and Family Review*, 34: 345–364.
- McElwain, N. L., Halberstadt, M. G. and Volling, B. L. 2007. Mother- and father-reported reactions to children’s negative emotions: Relations to young children’s emotional understanding and friendship quality. *Child Development*, 78: 1407–1425.
- McLoyd, V. C. 1998. Socioeconomic disadvantage and child development. *American Psychologist*, 53: 185–204.
- Murphy, K. and Barkley, R. A. 1996a. Attention-deficit/hyperactivity disorder in adults: Comorbidities and adaptive impairments. *Comprehensive Psychiatry*, 37: 393–401
- Murphy, K. and Barkley, R. A. 1996b. Prevalence of DSM-IV symptoms of ADHD in adult licensed drivers: Implications for clinical diagnosis. *Journal of Attention Disorders*, 1: 147–161.
- Murray, C. and Johnston, C. 2006. Parenting in mothers with and without attention-deficit/hyperactivity disorder. *Journal of Abnormal Psychology*, 115: 52–61.
- Parke, R. D. 2002. “Fathers and families”. In *The handbook of parenting: Being and becoming a parent*, 2nd, Edited by: Bornstein, M. H. Vol. 3, 27–73. Mahwah, NJ: Erlbaum.
- Power, T. J., Costigan, T. E., Leff, S. S., Eiraldi, R. B. and Landau, S. 2001. Assessing ADHD across settings: Contributions of behavioral assessment to categorical decision making. *Journal of Clinical Child Psychology*, 30: 399–412.

- Psychogiou, L., Daley, D., Thompson, M. and Sonuga-Barke, E. 2007. Mothers' expressed emotion toward their school-aged sons: Associations with child and maternal symptoms of psychopathology. *European Child and Adolescent Psychiatry*, 16: 458–464.
- Shelton, K. K., Frick, P. J. and Wootton, J. 1996. Assessment of parenting practices in families of elementary school-age children. *Journal of Clinical Child Psychology*, 25: 317–329.
- Valiente, C., Lemery-Chalfant, K. and Reiser, M. 2007. Pathways to problem behaviors: Chaotic homes, parent and child effortful control, and parenting. *Social Development*, 16: 249–267.
- Weiss, M., Hechtman, L. and Weiss, G. 2000. ADHD in parents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 39: 1059–1061.
- Willcutt, E. G., Doyle, A. E., Nigg, J. T., Faraone, S. V. and Pennington, B. F. 2005. Validity of the executive function theory of attention-deficit/hyperactivity disorder: A meta-analytic review. *Biological Psychiatry*, 57: 1336–1346.
- Zaslow, M. J., Weinfield, N. S., Gallagher, M., Hair, E., Ogawa, J. R., Egeland, B. 2006. Longitudinal prediction of child outcomes from differing measures of parenting in a low-income sample. *Developmental Psychology*, 42: 27–37.