

Parent Characteristics and Parent-Child Interactions in Families of Nonproblem Children and ADHD Children with Higher and Lower Levels of Oppositional-Defiant Behavior

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This study examined parent-child interactions and parent characteristics in families of nonproblem children and attention deficit hyperactivity disorder (ADHD) children with lower (ADHD-LOD) and higher (ADHD-HOD) levels of oppositional-defiant behavior. Families of ADHD children were recruited from a parent training program. Observed and parent-reported child behavior problems were highest in the ADHD-HOD group. Observed parent behavior revealed few differences, but daily reports indicated that parents in both ADHD groups used more negative-reactive and fewer positive parenting strategies than control parents. Maternal psychological functioning differed between the ADHD and nonproblem groups, but not between the two ADHD groups. Fathers of ADHD-HOD children reported more psychological disturbance than controls. Parenting self-esteem was lowest in the ADHD-HOD group and highest in the nonproblem group. The results support the LOD and HOD distinction, but also suggest that, although certain difficulties are more common in the families of ADHD-HOD children, families of ADHD-LOD children also differ from controls on a number of dimensions.

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With prevalence estimated at 5% of the school-aged population (American Psychiatric Association, 1987; Szatmari, Offord, & Boyle, 1989), attention deficit hyperactivity disorder (ADHD) is a relatively common childhood disorder. In addition to the defining difficulties of ADHD, these children often experience disruptions in their family relationships. For example, studies by Cunningham and Barkley (1979) and Mash and Johnston (1982) indicated that, in contrast to nonproblem mother-child dyads, ADHD children were less compliant and more negative and their mothers gave more commands, fewer rewards, and were less interactive in laboratory settings. Similar parent-child difficulties have been observed in studies with ADHD children of differing ages (Barkley, Karlsson, & Pollard, 1985), ADHD girls (Befera & Barkley, 1985), and in father-ADHD child interactions (Tallmadge & Barkley, 1983). Parents of ADHD children have also been the focus of research. For example, Mash and Johnston (1983) found that mothers of ADHD children reported less parenting self-esteem and more stress than mothers of normal children. Increased levels of depression, other psychiatric diagnoses, and marital dissatisfaction have also been found in parents of ADHD children compared to controls (Befera & Barkley, 1985; Cantwell, 1972; Cunningham, Benness, & Siegel, 1988; Morrison, 1980).

However, this literature describing the families of ADHD children is based on samples of ADHD children that were not differentiated in terms of oppositional-defiant (OD) behaviors. Considerable evidence now exists to support the distinctive, although interrelated, nature of ADHD symptoms and oppositional-defiant behaviors (Abikoff & Klein, 1992; Hinshaw, 1987). Indeed, recent research has suggested that parental disturbance and parent-child conflict in ADHD samples are more likely to be associated with the presence of oppositional-defiant behaviors than with the symptoms of ADHD.

Several studies have compared rates of disturbance in parents of ADHD children with and without a concurrent diagnosis of oppositional or conduct disorder (e.g., Anastopoulos, Guevremont, Shelton, & DuPaul, 1992; August, Stewart, & Holmes, 1983; Faraone, Biederman, Keenan, & Tsuang, 1991; Lahey, Piacentini, McBurnett, Stone, Hartdagen, & Hynd, 1988; Schachar & Wachsmuth, 1990). Summarizing across this research, it has generally been found that psychiatric disorders, substance abuse, family adversity, marital separations, parenting stress, and criminal activities are more common in families of ADHD children who are comorbid for oppositional or conduct disorder than in families of ADHD children who do not have these accompanying diagnoses. Indeed, the families of purely ADHD children often do not differ from normal controls. However, this research is not without inconsistencies and limitations. For example, Reeves, Werry, Elkind, and Zametkin (1987) found that, although ADHD children with conduct disorder experienced more family adversity than ADHD children with-

out conduct disorder, the two groups did not differ in rates of parental psychopathology, life stress, or marital dissatisfaction. Similarly, although Schachar and Wachsmuth (1990) found more overall parental psychiatric diagnoses in families of ADHD plus conduct disorder children, they failed to replicate previous reports (e.g., Lahey et al., 1988) of more parental antisocial personality disorder in this group. This area of research is also limited by a focus on parental psychiatric disorders and maternal reports of functioning. The present study was designed to expand on previous research contrasting parents of ADHD children who display lower and higher levels of oppositional-defiant behavior. A range of characteristics, including parenting self-esteem, social relationships, life stress, and psychological disturbance were examined in both mothers and fathers of ADHD children. A group of families of nonproblem children was included to provide a normative anchor for the comparisons of ADHD families.

Few studies have compared parent-child interactions in families of ADHD children with lower and higher levels of oppositional-defiant behavior. Summarizing across a number of studies, Loney (1987) concluded that, among ADHD children, it is oppositional-defiant behaviors rather than ADHD symptoms that are most related to reports of parent-child difficulties and family hostility. Using parent responses to a questionnaire, Schachar and Wachsmuth (1991) demonstrated that parents of children with both ADHD and conduct disorder diagnoses reported more problems in the parent-child relationship than parents of children with a sole diagnosis of ADHD who did not differ from a nonproblem control group. However, these studies remain limited by the methods used to measure parent-child interactions. Ratings of patients' charts or parent-completed checklists (Loney, Langhorne, & Paternite, 1978; Schachar & Wachsmuth, 1991) have been the most common measures of parent-child interactions. No published reports of observed parent-child interactions in families of ADHD children categorized according to the child's level of oppositional behavior exist. In the present study three methods—laboratory observations, daily reports of parent-child interactions in the home, and parent-completed questionnaires—were used to assess both mother-child and father-child interactions.

Previous research has relied on a diversity of methods for subgrouping ADHD children according to their level of oppositional-defiant behavior. Most studies (e.g., August et al., 1983; Lahey et al., 1988; Reeves et al., 1987) have relied on a diagnostic approach, using structured interviews concerning child behavior. However, as Loney (1987) has noted, diagnostic criteria, particularly prior to *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., rev.) (DSM-III-R; APA, 1987), are unlikely to provide the maximum discrimination between ADHD symptoms and oppositional-defiant behaviors. In this

study, rather than using categorical diagnostic criteria, ADHD children were subgrouped using a dimensional measure of oppositional-defiant behavior, the Aggression subscale of the IOWA Conners (Loney & Milich, 1982). The IOWA Conners was designed to provide a maximum distinction between oppositional-defiant behaviors and the inattention-overactivity symptoms of ADHD. The items chosen for the Aggression subscale have demonstrated reasonable divergent and convergent validity from ADHD symptoms in a number of studies, and subgroups of ADHD children formed using this subscale have been shown to differ on a number of dimensions (e.g., Johnston, Patenaude, & Inman, 1992; Johnston & Pelham, 1986; Loney, 1987; Loney & Milich, 1982; Milich & Fitzgerald, 1985).

In summary, this study employed the IOWA Conners Aggression subscale to divide ADHD children into groups with lower and higher levels of oppositional-defiant behavior. These groups, and a control group of non-problem children, were compared on measures of mother-child and father-child interactions and parent characteristics. It was predicted that parent-child conflict and parental disturbance would appear more often in families of ADHD children with higher levels of oppositional-defiant behavior than in either ADHD children with lower levels of oppositional-defiant behavior or the control group.

METHOD

Subjects

Forty-eight families referred to a parenting program for parents of 5- to 11-year-old children with ADHD participated in the study. All families participated prior to beginning treatment. In addition to the child having a referring diagnosis of ADHD, a semistructured parent interview and parent ratings on the ADHD Rating Scale (DuPaul, 1991) were used to confirm the diagnosis. Consistent with the criteria specified in DSM-III-R (APA, 1987), information from the parent interview served to exclude children who had not displayed ADHD symptoms prior to age 7 or for at least 6 months' duration, or who had developmental disabilities (e.g., autism, mental retardation). The ADHD Rating Scale (DuPaul, 1991) lists the DSM-III-R diagnostic criteria for ADHD and asks parents to rate how descriptive each symptom is of the child on a 4-point scale ranging from *not at all* to *very much*. Ratings above the median (*pretty much* or *very much*) were taken to indicate symptom presence and children were required to have at least 8 of the 14 ADHD symptoms based on an average of mother and father ratings, if both were available.

The 48 ADHD children were divided into groups with lower and higher levels of oppositional-defiant behavior (ADHD-LOD and ADHD-HOD, respectively) using parent ratings (again, averaged for mothers and fathers in two-parent families) on the IOWA Conners Aggression subscale (Loney & Milich, 1982). The five items on this subscale are rated on a 0 to 3 scale according to their descriptiveness of the child, with anchors ranging from *not at all* to *very much*. The Aggression subscale score is calculated by summing across the five items and can range from 0 to 15. Although parent norms are not available for this rating scale, teacher norms have been provided by Pelham, Milich, Murphy, and Murphy (1989). Following their recommendation, a cutoff score of 9 on the Aggression subscale was used to classify ADHD children as having lower (ADHD-LOD) or higher (ADHD-HOD) levels of OD behavior. Twenty-three children were classed as ADHD-LOD and 25 as ADHD-HOD.³

Thirty-three families of nonproblem children were recruited through newspaper and community notices. Children were classed as nonproblem if parent ratings (averaged in two-parent families) did not exceed 9 on the IOWA Aggression subscale or *T*-scores of 70 on the Internalizing and Externalizing scales of the Child Behavior Checklist (Achenbach & Edelbrock, 1983).

Table I presents descriptive information for the three groups. One-way analyses of variance (ANOVAs) comparing the groups on child and parent age, and family socioeconomic status (SES) indicated no significant differences (all *ps* > .30). Chi-square statistics comparing the three groups on the number of adopted children, male children, and single parents were also nonsignificant (*ps* of .13, .26 and .08, respectively). Finally, a chi square contrasting the two ADHD groups on the number of medicated children was also nonsignificant (*p* = .11).

Procedures

Initially, parents of ADHD children attended an interview session and were given questionnaire measures to complete at home. They returned, approximately 1 week later, with their ADHD child for the laboratory ob-

³Parents also rated their children on the symptoms of oppositional defiant and conduct disorders. Parent ratings were averaged in two-parent families. On a 0 to 3 scale, using ratings of 2 or 3 as indicative of symptom presence, 13% of the ADHD-LOD children were rated as meeting criteria for oppositional defiant disorder (ODD) and 84% of the ADHD-HOD children met this criteria. None of the ADHD-LOD children and 36% of the ADHD-HOD met criteria for conduct disorder. Reanalysis of the data excluding ADHD-LOD children who met ODD criteria and ADHD-HOD children who did not meet ODD criteria essentially replicated the results reported for the full groups.

Table I. Descriptive Information for Families of Nonproblem Children and ADHD Children with Lower and Higher Levels of Oppositional-Defiant Behavior^d

	Nonproblem (<i>n</i> = 33)		ADHD-LOD (<i>n</i> = 23)		ADHD-HOD (<i>n</i> = 25)	
Child age ^b	101.58	(20.39)	98.13	(25.52)	105.00	(20.62)
Mother age ^c	35.64	(3.66)	37.27	(4.37)	35.92	(5.40)
Father age ^c	38.68	(3.86)	38.94	(6.73)	40.29	(7.12)
Socioeconomic status ^d	2.48	(1.12)	2.52	(1.12)	2.92	(1.15)
Percent boys	82		87		96	
Percent adopted	3		0		12	
Percent single mothers	12		17		36	
Percent medicated	0		22		48	

^aStandard deviations in parentheses. ADHD = attention deficit hyperactivity disorder; ADHD-LOD = ADHD children with lower levels of oppositional-defiant behavior; ADHD-HOD = ADHD children with higher levels of oppositional-defiant behavior.

^bChild age in months.

^cParent age in years.

^dSocioeconomic status calculated according to the Hollingshead Four Factor Index of Social Status (Hollingshead, 1975).

ervation session. Completed questionnaires were to be returned at that time. When responding to recruitment notices, families of nonproblem children completed a brief telephone screening interview and were mailed the questionnaires for completion prior to their laboratory visit. Each parent was paid \$10 for participation. Mothers and fathers were instructed to complete the questionnaires independently of each other.

The laboratory observation was conducted in a room furnished with sofas, end tables and lamps, book shelves, a file cabinet, a table and chairs, a child's table and chair, and numerous toys (e.g., lego, velcro darts and board, toy trucks, coloring books). Parent-child interactions were videotaped from behind an observation mirror and audio-recorded with a microphone suspended from the ceiling. Each parent engaged in a 30-min interaction with the child, with the order of mother-child and father-child interactions counterbalanced across two-parent families. The first 10 min of the parent-child interaction were devoted to free play and served as a habituation period. Then, the parent was given a set of written instructions and materials for tasks the child was to complete. Tasks included activities such as sharpening a pencil, dusting a small table, sorting and folding socks, and sorting cards belonging to different decks. Two parallel sets of 10 tasks were used and counterbalanced across mothers and fathers. In the remaining 10 minutes, the child was to complete a set of age-appropriate academic tasks. Parents were instructed to have the children work as independently

as possible on these tasks. Data for the parent-child interactions during the 10 min of tasks and 10 min of academics are reported. ADHD children who were receiving stimulant medication treatment ($n = 17$) were withdrawn from this medication 24 hours prior to the laboratory observation. Arrangements were made at the conclusion of the observation session to complete daily phone interviews over the next 7 days.

Measures

Parent-Child Interactions. Reports of parent-child interactions were assessed using the Home Situations Questionnaire (Barkley & Edelbrock, 1987). This measure asks parents for the number of common home situations in which the child's behavior is problematic (Number of Problems) and the severity of these problems (Severity of Problems). The measure is reliable and valid, and normative data are available (Barkley & Edelbrock, 1987).

Parent-child interactions were also assessed as part of the daily telephone interviews conducted for 7 days following the observation sessions. Almost all interviews were conducted with the mothers (86.3%). The daily phone interview was modeled after the technique described by Chamberlain and Reid (1987). The interviews asked about the previous 24 hours and were completed each evening after the children's bedtimes. Mothers rated their mood (Daily Mood), marital satisfaction (Daily Marital), and life stress (Daily Stress). Mothers also indicated whether or not their children had presented a problem in 13 of the situations from the Home Situations Questionnaire (Daily Problems) and, if so, what the parenting response had been. Using each day's rating as an item, an estimate of the internal consistency of the Daily Problems index was calculated as .84 using Cronbach's alpha. Parenting responses to child problem behaviors were grouped into four categories: negative consequences (i.e., verbal reprimands, timeout, physical punishment, loss of privileges), nonreactive or positive consequences (i.e., ignoring, allowing natural consequences to occur, rewarding incompatible behavior, discussing the problem with the child), prevention (e.g., setting clear rules, prompting the child, altering the situation), and other responses. Scores are expressed as the percentage of time each type of strategy was used. These categories were adapted from previous research on parenting (Grusec & Kuczynski, 1980; Johnston & Behrenz, 1993). Because many parents reported days with no child behavior problems, and hence no reported parenting strategies, internal consistency could not be estimated for this measure. However, the interviews were conducted by individuals trained to use the strategies coding system in studies of child-

rearing discussions. Interrater reliabilities in these studies ranged between .67 and .93 (Johnston & Behrenz, 1993), and .72 and .90 (Johnston, 1994).

Finally, parent-child interactions were assessed via observational coding of the videotaped interactions. Five female coders were trained to use the Response Class Matrix (RCM; Mash, Terdal & Anderson, 1973) and independently coded mother-child and father-child interactions during the 10 min of tasks and 10 minutes of academics. The RCM codes specific classes of parent and child behaviors every 15 sec. Summary measures indicating the percentage of intervals in which the parent was directive, negative, social, gave praise, or didn't respond and the percentage of intervals in which the child was compliant, oppositional, social, or didn't respond are reported. Such summary measures have proven sensitive to parent-ADHD child interactions difficulties (Cunningham & Barkley, 1979; Mash & Johnston, 1982). Observers were blind as to the OD status of the ADHD children, however, it was not always possible to keep observers unaware of the ADHD versus nonproblem status of the child. Videotapes were coded in a randomly determined order. Seventeen percent of the tapes were independently coded by two observers to provide estimates of reliability. Another 2% were group coded as part of training or because observers failed to reach an adequate level of agreement.

The reliability of RCM observations was calculated in two ways for the 101 parent-child interactions that were independently coded by two observers. First, interobserver agreement was calculated on an interval-by-interval basis and ranged from 70% to 96%, with an average of 84%. Second, for each summary category, correlations were calculated between observers' scores. For parent behaviors, the correlations were .87 for directiveness, .89 for social behavior, .93 for praise, and .95 for not responding. No parent negative behaviors were coded in the reliability sample so correlations were not computed. For child behaviors, the correlations were .95 for compliance, .67 for not responding, .96 for social behavior, and .83 for oppositional behavior. All correlations were significant at the .001 level.

Parent Characteristics. The Symptom Checklist 90—Revised (SCL 90-R; Derogatis, 1983) was used to measure psychological distress. This measure has demonstrated reliability and validity, and normative data are available (Derogatis, 1983). Mother and father *T*-scores on the Obsessive-Compulsive (includes items such as forgetfulness, indecisiveness, and trouble concentrating, which may reflect ADHD), Depression, and Hostility subscales were examined. These scales were chosen to reflect dimensions of psychological functioning that have been identified as problematic in previous studies of parents of ADHD children (e.g., Cunningham et al., 1988; Faraone et al., 1991, Lahey et al., 1988). The average rating from the Daily Mood item on the phone interview was also used to reflected

maternal psychological distress. This rating could range from 1 to 7, with anchors of *very happy* and *very sad*. Across the 7 days, the internal consistency of this rating was estimated at .78.

Parenting self-esteem was assessed using the total score from the Parenting Sense of Competence Scale (PSOC; Johnston & Mash, 1989). This measure taps the extent to which parents feel confident and satisfied in the parenting role. The questionnaire has demonstrated evidence of reliability and validity, and normative data are available (Johnston & Mash, 1989).

The Perceived Social Support Scale (Procidano & Heller, 1983) was used to assess perceived support from friends. This measure has demonstrated internal consistency and expected relationships with other psychological constructs (Procidano & Heller, 1983). The Dyadic Adjustment Scale (DAS; Spanier, 1976) was used to measure marital satisfaction, and raw scores are reported for mothers and fathers. This commonly used measure shows high internal consistency and correlates with other indices of marital adjustment (Spanier, 1976). The average rating from the Daily Marital item on the phone interview was also reported and could range from 1 to 7, with anchors of *very positive marital relationship* and *very negative marital relationship*. Internal consistency was estimated at .83 for this rating.

Finally, the Life Experiences Survey (LES; Sarason, Johnson, & Siegel, 1978), completed by mothers, was used to assess family stress. This measure asks respondents to rate the valence and severity of both positive and negative events that have occurred in the past year. This measure has sound psychometric properties and evidence suggests that the severity of negative events is the most sensitive indicator of stress (Sarason et al., 1978). The average rating from the Daily Stress item on the phone interview was also included. This rating could range from 1 to 7, with anchors of *no life stress* to *a lot of life stress*. Ratings of Daily Stress yielded an internal consistency estimate of .80.

RESULTS

To protect against Type I error in the multiple comparisons conducted in the study, each group of variables (i.e., parent reports of parent-child interactions, observations of parent-child interactions, and measures of parent characteristics) was initially considered in a multivariate analysis of covariance (MANCOVA) conducted separately for mothers and fathers. Child age served as the covariate in all analyses. If the multivariate test indicated a significant difference among the groups, followup univariate

F-tests were conducted with Student–Newman–Keuls *post hoc* comparisons at the .05 alpha level. The one exception to this general strategy was the marital measures. Including these measures in the general multivariate tests would have resulted in the exclusion of all single mothers from the analysis (because missing data are excluded on an analysis-by-analysis basis). Therefore, mother and father DAS scores and the Daily Marital item were each examined using univariate analyses of covariance (ANCOVAs).

The first set of variables represented mothers' reports of parent–child interactions, and included Number of Problems and Severity of Problems, Daily Problems, Negative Consequences, Positive-Nonreactive Consequences, and Prevention. The MANCOVA comparing the three groups on these six variables was significant, $F(12, 144) = 13.92, p < .001$. Followup univariate tests indicated significant differences on the Number of Problems, $F(2, 77) = 59.07, p < .001$; Severity of Problems, $F(2, 77) = 103.52, p < .001$; Daily Problems, $F(2, 77) = 17.21, p < .001$; Negative Consequences, $F(2, 77) = 9.64, p < .01$; and Positive-Nonreactive Consequences, $F(2, 77) = 4.45, p < .02$. *Post hoc* comparisons indicated that, for all variables, the nonproblem group was significantly different from the two ADHD groups; however, only for Severity of Problems did the two ADHD groups differ, with more severe problems reported for the ADHD–HOD group.

For father reports of parent–child interactions, the two Home Situations Questionnaire scores were first examined in a MANCOVA which revealed a significant group difference, $F(4, 112) = 17.37, p < .001$. Univariate *F*s revealed significant effects for both Number of Problems, $F(2, 57) = 32.63, p < .001$, and Severity of Problems, $F(2, 57) = 27.30, p < .001$. *Post hoc* comparisons indicated that the nonproblem group was significantly different from the two ADHD groups on both variables, but the two ADHD groups did not differ. Means (adjusted for child age), standard deviations, and group differences for the variables reflecting parent reports of parent–child interactions are shown in Table II.

Next, observational measures of the parent–child interactions were considered, with separate analyses for mothers and fathers, and for task and academic situations. Because the summary measures from the Response Class Matrix are expressed as percentages, if all measures are used they are linearly dependent on one another. Therefore, parent and child not responding were omitted from these analyses. Looking first at mother–child interactions in the task situation, the MANCOVA comparing the three groups on mother directiveness, social behavior, giving praise, and negative, and child compliance, social behavior, and oppositional behavior produced a significant overall group effect, $F(14, 142) = 1.84, p < .05$. The univariate effects were not significant for any mother behaviors, but

Table II. Child-Age Adjusted Means and Standard Deviations (in Parentheses) for Measures of Parent-Child Interactions in Families of Nonproblem Children and ADHD Children with Lower and Higher Levels of Oppositional-Defiant Behavior^d

	Nonproblem		ADHD-LOD		ADHD-HOD	
Mother-child interactions						
	(n = 33)		(n = 23)		(n = 25)	
Home Situations Questionnaire ^b						
Number of Problems	0.12 _a	(0.91)	2.44 _b	(1.07)	2.50 _b	(0.92)
Severity of Problems	-0.36 _a	(0.58)	1.58 _b	(0.86)	2.25 _c	(0.78)
Daily problems	0.80 _a	(0.67)	2.02 _b	(1.17)	2.05 _b	(1.00)
Daily parenting strategies						
Positive-nonreactive	0.29 _a	(0.24)	0.15 _b	(0.12)	0.17 _b	(0.15)
Negative	0.27 _a	(0.25)	0.42 _b	(0.19)	0.50 _b	(0.11)
Prevention	0.37 _a	(0.26)	0.31 _a	(0.17)	0.26 _a	(0.15)
Response Class Matrix—Task Situation						
Mother directive	31.67 _a	(10.93)	32.27 _a	(8.64)	34.89 _a	(11.74)
Mother social	43.22 _a	(13.31)	41.16 _a	(11.35)	39.52 _a	(10.57)
Mother praise	2.57 _a	(3.34)	3.56 _a	(4.05)	3.45 _a	(3.59)
Mother negative	0.15 _a	(0.61)	0.00 _a	(0.00)	0.13 _a	(0.66)
Child compliant	96.22 _a	(6.13)	88.37 _{ab}	(15.10)	85.28 _b	(23.29)
Child social	2.49 _a	(4.92)	8.34 _b	(12.01)	6.14 _{ab}	(7.54)
Child oppositional	0.15 _a	(0.61)	0.43 _a	(1.23)	4.33 _b	(8.99)
Response Class Matrix—Academic Situation						
Mother directive	14.49 _a	(13.12)	17.27 _{ab}	(8.02)	24.19 _b	(15.25)
Mother social	26.11 _a	(16.55)	27.02 _a	(20.39)	25.10 _a	(11.08)
Mother praise	2.19 _a	(3.41)	1.44 _a	(2.57)	2.60 _a	(3.71)
Mother negative	0.08 _a	(0.44)	0.00 _a	(0.00)	0.10 _a	(0.50)
Child compliant	95.54 _a	(8.66)	95.41 _a	(7.05)	94.08 _a	(8.33)
Child social	2.64 _a	(4.84)	2.41 _a	(3.95)	3.32 _a	(4.35)
Child oppositional	0.98 _a	(2.25)	1.32 _a	(4.32)	2.10 _a	(4.73)
Father-child interactions						
	(n = 29)		(n = 19)		(n = 14)	
Home Situations Questionnaire						
Number of Problems	0.22 _a	(1.24)	2.23 _b	(0.78)	2.63 _b	(0.94)
Severity of Problems	-0.16 _a	(0.76)	1.17 _b	(0.84)	1.54 _b	(0.79)
Response Class Matrix—Task Situation						
Father directive	34.58 _a	(12.07)	35.67 _a	(12.40)	35.61 _a	(10.63)
Father social	41.80 _a	(12.74)	43.64 _a	(10.59)	39.50 _a	(12.41)
Father praise	3.09 _a	(3.84)	3.01 _a	(3.62)	1.85 _a	(2.99)
Father negative	0.00 _a	(0.00)	0.12 _a	(0.57)	0.01 _a	(0.00)
Child compliant	96.94 _a	(3.61)	93.87 _a	(9.55)	89.64 _a	(22.65)
Child social	2.16 _a	(2.39)	3.49 _a	(4.80)	5.57 _a	(12.70)
Child oppositional	0.40 _a	(1.40)	1.87 _a	(2.54)	2.34 _b	(2.72)
Response Class Matrix—Academic Situation						
Father directive	17.52 _a	(15.81)	29.12 _b	(23.55)	15.86 _a	(12.65)
Father social	27.02 _a	(13.44)	31.73 _a	(19.01)	27.78 _a	(15.14)
Father praise	2.46 _a	(3.39)	1.20 _a	(1.93)	1.50 _a	(3.16)

Table II. Continued

	Nonproblem		ADHD-LOD		ADHD-HOD	
Response Class Matrix—Academic Situation						
Father negative	0.29 _a	(1.42)	0.00 _a	(0.00)	0.52 _a	(1.88)
Child compliant	95.32 _a	(9.65)	93.72 _a	(12.92)	88.89 _a	(24.61)
Child social	1.96 _a	(3.77)	3.91 _a	(6.37)	5.40 _a	(7.12)
Child oppositional	2.04 _a	(6.75)	1.82 _a	(6.84)	1.53 _a	(3.40)

^aMeans with the same subscripts are not significantly different. ADHD = attention deficit hyperactivity disorder; ADHD-LOD = ADHD children with lower levels of oppositional-defiant behavior; ADHD-HOD = ADHD children with higher levels of oppositional-defiant behavior.

^bHome Situations Questionnaire scores are standard scores. Daily Problems is the average number of problems reported per day in the daily interview. Parenting Strategies are the average percentages of strategies used in each category. Response Class Matrix scores are the percentages of intervals in which the behavior occurred.

there were significant group differences on child compliance, $F(2, 77) = 3.73, p < .05$; oppositional, $F(2, 77) = 5.50, p < .01$; and social, $F(2, 77) = 3.70, p < .05$ behaviors. *Post hoc* analyses indicated that for child compliance only the nonproblem and ADHD-HOD groups differed significantly; for oppositional behavior the control and ADHD-LOD groups were significantly different from the ADHD-HOD group, but not from each other; and for social behavior only the nonproblem and ADHD-LOD groups differed. The MANCOVA for observational measures of the mother-child academic situation was nonsignificant.

The MANCOVA for observational measures of the father-child task interaction produced a marginally significant group effect, $F(14, 108) = 1.56, p < .10$. Although risking a Type I error, univariate tests were conducted. Only the test for child oppositional behavior was significant, $F(2, 60) = 4.79, p < .01$, and *post hoc* analyses indicated that the nonproblem and ADHD-LOD groups did not differ, but both were less oppositional than the ADHD-HOD group. The MANCOVA for observational measures of the father-child academic interaction revealed a significant group effect, $F(14, 106) = 1.88, p < .05$. Only the univariate effect for father directiveness was significant, $F(2, 59) = 5.95, p < .01$. Interestingly, fathers of ADHD-LOD children were more directive than either fathers of ADHD-HOD children or fathers of nonproblem children. ADHD-HOD and nonproblem groups did not differ. Information for the observational variables is shown in Table II.

For parent characteristics, the MANCOVA comparing mothers in the three groups on the SCL Obsessive-Compulsive, Depression, and Hostility

scores, the PSOC score, the Perceived Social Support and LES Severity of Negative Events scores, and the Daily Mood and Daily Stress scores was significant, $F(16, 140) = 3.09, p < .01$. Univariate ANCOVAs were significant for the following variables: SCL Obsessive-Compulsive, $F(2, 77) = 6.73, p < .01$; Depression, $F(2, 77) = 7.88, p < .001$; and Hostility, $F(2, 77) = 8.08, p < .001$; PSOC, $F(2, 77) = 11.35, p < .001$; LES Severity of Negative Events, $F(2, 77) = 8.06, p < .01$; and Daily Mood, $F(2, 77) = 3.81, p < .05$. *Post hoc* comparisons indicated that, for all three SCL scales as well as Daily Mood and LES life stress, the nonproblem group had significantly fewer problems than the two ADHD groups, who did not differ from each other. On the PSOC, all three groups significantly differed from one another. Mothers of nonproblem children experienced the greatest feelings of parenting competence and mothers of ADHD-HOD children the least. The mothers' DAS and Daily Marital scores were examined with ANCOVAs. The DAS revealed a significant group effect, $F(2, 60) = 6.66, p < .01$, as did the Daily Marital item, $F(2, 62) = 4.68, p < .05$. The nonproblem group had significantly better marital adjustment than the two ADHD groups, which did not differ on the DAS, and only the nonproblem and ADHD-HOD groups differed significantly on Daily Marital.

The MANCOVA for father characteristics (SCL Obsessive-Compulsive, Depression, and Hostility, PSOC, and Perceived Social Support) was significant, $F(10, 104) = 2.77, p < .01$. Univariate ANCOVAs revealed significant effects for the SCL scales of Obsessive-Compulsive, $F(2, 58) = 3.77, p < .05$, and Depression, $F(2, 58) = 4.52, p < .05$; and the PSOC score, $F(2, 58) = 13.86, p < .001$. On the SCL scales, only the nonproblem and ADHD-HOD groups differed. On the PSOC, all three groups differed significantly. As with mothers, fathers of nonproblem children reported the highest levels of parenting competence and fathers of ADHD-HOD children the lowest. The ANCOVA for fathers' DAS scores was significant, $F(2, 58) = 4.91, p < .05$, and *post hoc* comparisons indicated that the nonproblem group was significantly better adjusted than the two ADHD groups, which did not differ. Means, standard deviations, and group differences for parent characteristics are shown in Table III.

DISCUSSION

Results from this sample of families with ADHD children referred for parent training suggest that, although certain difficulties in parent-child interactions are more common in families having ADHD children with higher levels of oppositional-defiant behavior than in families having nonproblem children, these difficulties also often appear in families of ADHD

Table III. Child-Age Adjusted Means and Standard Deviations (in Parentheses) for Measures of Parent Characteristics in Parents of Nonproblem Children and ADHD Children with Lower and Higher Levels of Oppositional-Defiant Behavior^a

	Nonproblem		ADHD-LOD		ADHD-HOD	
Mothers						
	(n = 33)		(n = 23)		(n = 25)	
Symptom Checklist 90-R ^b						
Obsessive-Compulsive	50.60 _a	(8.01)	58.46 _b	(10.30)	57.26 _b	(8.55)
Depression	51.26 _a	(9.55)	58.98 _b	(8.00)	59.14 _b	(9.04)
Hostility	51.72 _a	(7.72)	59.44 _b	(9.65)	59.73 _b	(9.41)
Daily Mood	2.92 _a	(0.76)	3.48 _b	(0.98)	3.54 _b	(1.14)
Parenting Sense of Competence						
Total	0.55 _a	(1.14)	-0.04 _b	(0.91)	-0.78 _c	(1.08)
Perceived Social Support	15.55 _a	(4.38)	15.31 _a	(5.00)	13.89 _a	(4.82)
Life Events Survey						
Negative Severity	1.35 _a	(0.41)	1.70 _b	(0.72)	1.93 _b	(0.69)
Daily Stress	3.26 _a	(1.07)	3.68 _a	(1.19)	3.81 _a	(1.02)
Dyadic Adjustment ^c	115.01 _a	(13.97)	106.58 _b	(13.54)	99.80 _b	(15.93)
Daily Marital ^c	2.45 _a	(0.76)	2.87 _{ab}	(0.81)	3.24 _b	(0.99)
Fathers						
	(n = 29)		(n = 19)		(n = 14)	
Symptom Checklist 90-R ^b						
Obsessive-Compulsive	51.86 _a	(11.26)	55.53 _{ab}	(8.59)	61.16 _b	(10.40)
Depression	51.24 _a	(11.35)	54.53 _{ab}	(10.02)	61.42 _b	(7.88)
Hostility	54.07 _a	(7.85)	54.47 _a	(9.39)	60.35 _a	(9.86)
Parenting Sense of Competence						
Total	.42 _a	(1.25)	-0.55 _b	(0.99)	-1.62 _c	(1.28)
Perceived Social Support	11.55 _a	(5.89)	8.72 _a	(4.75)	8.31 _a	(6.20)
Dyadic Adjustment	113.76 _a	(10.58)	106.00 _b	(12.66)	101.88 _b	(16.53)

^aMeans with the same subscript are not significantly different. ADHD = attention deficit hyperactivity disorder; ADHD-LOD = ADHD children with lower levels of oppositional-defiant behavior; ADHD-HOD = ADHD children with higher levels of oppositional-defiant behavior.

^bSymptom Checklist 90-R scores are *T*-scores. Daily Mood and Daily Stress can range from 1 to 7. Parenting Sense of Competence scores are standard scores. Perceived Social Support and Dyadic Adjustment scores are in raw form. Average Negative Severity on the Life Events Survey can range from 0 to 3.

^cNumber of subjects for the mother marital measures are 29 for the nonproblem group, 19 for the ADHD-LOD group, and 16 for the ADHD-HOD group.

children with lower levels of oppositional-defiant behavior. It was only on mother reports of the severity of child problems, observed child oppositional behavior, and parenting self-esteem that ADHD children with lower and higher levels of oppositional-defiant behavior were distinguished. Measures of daily marital interactions and fathers' psychological functioning were sensitive to differences between families of nonproblem children

and ADHD children with higher levels of oppositional-defiant behavior, with the LOD group falling in the midrange. In contrast, most observed parent behaviors, father reports of child behavior, child behavior in the academic situation, mother psychological functioning, and general marital adjustment indicated few differences between the two ADHD groups. Indeed, on several measures of observed parent and child behavior and reports of social support neither ADHD group differed from controls.

These results provide support for the use of parent ratings on the IOWA Conners Aggression subscale as a method of distinguishing ADHD children according to their level of oppositional-defiant behavior. Parent scores on this scale provided subgroups of children who differed on mother reports of child misbehavior and in observed rates of oppositional behavior. In addition, for both mothers and fathers, there were significant drops in parenting self-esteem across parents of nonproblem children, ADHD-LOD children, and ADHD-HOD children. This suggests that both ADHD symptoms and oppositional-defiant child behaviors provide challenges to parents' feelings of competence and satisfaction in the parenting role, perhaps in an additive fashion. Although this study detected only a few LOD versus HOD differences in parenting behavior, responses on the parenting self-esteem measure suggest that parents feel differently about being the parents of these two types of children. These differences in self-esteem may translate into variations in parenting behavior, such as warmth or responsiveness, that are not captured by observations or reports of parenting strategies.

In the academic situation, child behavior not only did not distinguish the two ADHD groups, it did not vary across ADHD and control children. This lack of sensitivity is likely the result of a ceiling effect in child compliance. Almost all children found the academic work interesting and displayed high levels of compliance (average over 90%). Also, the academic situation called for relatively little parent-child interaction and, as such, elicited few parent-child power struggles such as emerged when parents made demands of their children in the task situation. Turning to parenting behavior, contrary to expectations and previous research (e.g., Loney, 1987; Schachar & Wachsmuth, 1991), the task interactions revealed no differences in parent behavior across the three groups. Again, we speculate that the structure of this situation may have contributed to the lack of group differences. The task requirements in this study (a set of 10 tasks) were greater than those used in previous research comparing ADHD and control families (e.g., Cunningham & Barkley, 1979; Mash & Johnston, 1982), and this escalation in demands may have produced more consistent rates of parent behavior (e.g., directiveness) than would occur in a less demanding situation. In the academic task situation, fathers revealed differential rates

of directiveness. However, contrary to prediction, it was fathers of LOD children who were significantly more directive than the controls. Fathers of HOD children did not differ from the nonproblem group. This unexpected finding is not readily interpretable and requires replication.

In contrast to the laboratory observations, mothers of ADHD children did report less favorable parenting practices than parents of nonproblem children in the daily interviews. However, the rates of various parenting strategies reported in the ADHD-LOD and ADHD-HOD groups were nearly identical. Given that all ADHD families had been referred for behavioral parent training, it may be argued that a selection bias was operating to produce an ADHD sample with consistent difficulties in parent-child interactions. However, this interpretation is difficult to reconcile with the failure to find differences between the ADHD and nonproblem groups in the laboratory observations of parent behavior or with the observed and reported differences in child oppositional behavior. In sum, the results are inconclusive in demonstrating whether the parents of ADHD-LOD and ADHD-HOD children show disruptions in parenting compared to controls or to each other. Further research is needed and may benefit from the use of less structured observation situations or more subtle, stylistic measures of parenting behavior. Perhaps parents of ADHD-LOD and ADHD-HOD children differ not in the content but in the manner of their parenting (e.g., in the intrusiveness or affective tone of their instructions).

The measures of parent characteristics in this study revealed mixed results. Contrary to Cunningham et al. (1988), parental social support did not differ across the three groups, and as found in previous studies (e.g., Anastopoulos et al., 1992; Reeves et al., 1987; Schachar & Wachsmuth, 1991), differences in life stress were inconsistent across the two measures used. For both mothers and fathers, marital adjustment was lower in ADHD families than nonproblem families, but did not discriminate the two ADHD subgroups. However, daily marital interactions did show a significant difference between the nonproblem and HOD group. Other research has suggested more divorce or marital separation in families of ADHD children with accompanying oppositional-defiant behavior (e.g., Faraone et al., 1991), and our sample revealed a similar trend of more single mothers in the ADHD-HOD group ($p = .08$).

Measures of parental psychological functioning also revealed similarities and differences in comparison to previous studies. The typical pattern on the SCL was that mothers in both ADHD groups indicated more disturbance (scores approximately $3/4$ to 1 *SD* above the normative mean) than mothers in the nonproblem group. For fathers on the SCL, the most typical pattern was one of increasing disturbance across the nonproblem, ADHD-

LOD (scores approximately $\frac{1}{2}$ *SD* above the normative mean) and ADHD-HOD (scores more than 1 *SD* above the normative mean) groups, with only the nonproblem versus ADHD-HOD difference reaching significance. Thus, ADHD symptoms but not oppositional-defiant behavior seemed to predict psychological disturbance among mothers, whereas for fathers ADHD symptoms and oppositional-defiant child behavior appeared to exert additive effects on the level of psychological disturbance. Comparing these results to those of previous research, the findings for fathers are consistent with those of investigators such as Lahey et al. (1988) and Faraone et al. (1991) in suggesting that the greatest paternal psychological disturbance is associated with the comorbidity of child ADHD symptoms and oppositional-defiant behavior. For mothers, the results do not replicate previous differences found between oppositional and nonoppositional ADHD groups (e.g., Lahey et al., 1988, Schachar & Wachsmuth, 1990), but do confirm reports of more maternal disturbance in ADHD compared to nonproblem samples (e.g., Cunningham et al., 1988; Mash & Johnston, 1983). Perhaps differences in the method of subtyping ADHD children or the use of a dimensional measure of functioning, rather than psychiatric diagnoses, contributed to the discrepancies between this and previous studies.

The results of this study must be tempered by an appreciation of the power of the statistical analyses and the nature of the ADHD sample and subgroups. Although the sample size in this study was comparable to that of previous investigations (e.g., Lahey et al., 1988; Schachar & Wachsmuth, 1990), the differences to be detected between ADHD-LOD and ADHD-HOD families may be small and require either larger samples or subgroups with more extreme differences in oppositional-defiant behavior. As noted previously, all of the ADHD families in this report were referred to a parent training program, and thus the sample may have been biased to include children exhibiting a high rate of oppositional-defiant behavior. However, all but one LOD child received an IOWA Aggression score below 8, and the mean score of 6.21 was well below the cutoff of 9. It is also possible that, because most previous research has combined parent and teacher reports of behavior in classifying children as higher or lower in oppositional-defiant behavior, the absence of teacher reports in this study may have led to a LOD group that displayed oppositional behavior in school but not at home. Finally, the HOD group did show trends toward having more single mothers and medicated children than the other groups. However, the greater frequency of medication use in this group is likely to exert a conservative influence on comparisons and, when analyses were conducted excluding all single mothers, the ordering of means was unchanged and most differences remained significant at the .10 level or lower.

In conclusion, these results expand our understanding of the families of ADHD children and validate the use of parent ratings on the IOWA Conners Aggression subscale as an index for subgrouping ADHD children. Findings from several of the dependent measures supported the need to distinguish ADHD children according to their level of oppositional-defiant behavior. However, other findings illuminated the fact that families of ADHD children with relatively low levels of oppositional-defiant behavior continue to differ from nonproblem controls. Clearly, family and parental variables are likely to remain important considerations, not only in the assessment and treatment of ADHD children who are also oppositional-defiant, but also for ADHD children without these accompanying problems.

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