Parenting Stress Among Families of Children with Attention Deficit Hyperactivity Disorder

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Abstract:
Prior research has shown that parenting stress levels can be quite high among families of children with attention deficit hyperactivity disorder (ADHD). This study investigated the degree to which such stress was related not only to the child's ADHD, but also to various other child, parent, and family—environment circumstances. Multimethod assessments were conducted on 104 clinic-referred children with ADHD. Data collected from these subjects were entered into hierarchical multiple-regression analyses, utilizing the Parenting Stress Index as the criterion. The results showed that child and parent characteristics accounted for a substantial portion of the variance in overall parenting stress. The child's oppositional—defiant behavior and maternal psychopathology were especially potent predictors. The severity of the child's ADHD, the child's health status, and maternal health status also emerged as significant predictors. These findings are discussed in terms of their impact upon the clinical management of children with ADHD.

Article:
Attention deficit hyperactivity disorder (ADHD) is a chronic and pervasive condition characterized by developmental deficiencies in sustained attention, impulse control, and the regulation of motor activity in response to situational demands (American Psychiatric Association, 1987). When present, ADHD very often can be highly disruptive, adversely affecting many areas of child psychosocial functioning (Barkley, 1990). For example, virtually all children with ADHD display significant academic underachievement (Barkley, DuPaul, & McMurray, 1990). As many as 65% may exhibit aggressive behavior or oppositional—defiant tendencies as well (Loney & Milich, 1982). Low self-esteem, anxiety, depression, and other emotional complications also are quite common (Margalit & Arieli, 1984). So too are peer relationship problems (Guevremont, 1990; Pelham & Bender, 1982).

Although a direct causal connection has yet to be firmly established, there is correlational evidence suggesting that ADHD impacts far more than the functioning of the child. Parent functioning may be affected as well. Of particular clinical significance is that parents of children with ADHD very often experience considerable stress in their parenting roles. Such stress

typically is much greater than that found among families of normal controls (Breen & Barkley, 1988; Gillberg, Caristrom, & Rasmussen, 1983; Mash & Johnston, 1983a).

Whether this stress emanates directly from the child's ADHD is unclear at present. Clinical experience would suggest that it probably does, at least to some degree, given the increased caretaking demands that children with ADHD impose on their parents. These include more frequent displays of noncompliance, related to the child's difficulties in following through on parental instructions (Cunningham & Barkley, 1979). In addition, parents of these children often find themselves involved in resolving various school, peer, and sibling difficulties, which occur throughout childhood (Barkley, 1990) and into adolescence as well (Barkley, Anastopoulos, Guevremont, & Fletcher, 1991).

Despite its intuitive appeal, it would seem overly simplistic to view the child's ADHD as the sole determinant of elevated parenting stress. Many other child factors presumably are involved. In line with this contention, some researchers have speculated that the defiant behavior of ADHD children is an especially potent contributor to parenting stress (Tallmadge, Paternite, & Gordon, 1989). To the extent that conduct problems occur more often in ADHD boys than girls (Berry, Shaywitz, & Shaywitz, 1985), gender differences may come into play as well. Age very likely plays a role, with younger children with ADHD being more stressful to their parents than older children (Mash & Johnston, 1983a). Given that higher stress levels are commonly observed among parents of first-born children with ADHD (Mash & Johnston, 1990), ordinal position may also be involved. Another potential influence is the child's health status. This stems from a consideration of recent findings showing that raising children with health difficulties is associated with higher levels of parenting stress (Bendell, Culbertson, Shelton, & Carter, 1986; Frank et al., 1991). Although not specific to the ADHD population, these results nevertheless may have a bearing, given the relatively higher incidence of health problems that occurs within this group (Hartsough & Lambert, 1985).

Above and beyond the impact of these child characteristics, other psychosocial factors presumably affect the amount of stress that parents of ADHD children encounter in their parenting roles. As has been recently proposed, these include a wide range of parent characteristics, as well as various family—environment circumstances, which purportedly interact in a reciprocal fashion with the child's characteristics to produce elevated levels of parenting stress (Bell & Harper, 1977; Mash & Johnston, 1990). Unfortunately, relatively little research has addressed these matters within an ADHD population. What evidence is available suggests the following. Depression and other types of parental psychopathology, which occur more often in ADHD families than in normal populations (Cunningham, Benness, & Siegel, 1988; Lahey et al., 1988), very likely exacerbate parenting stress. So too may parental mood, independent of whether or not psychopathology is involved (Jouriles, Murphy, & O'Leary, 1989). The relatively higher incidence of marital dysfunction that is found within the ADHD population is another potential influence on parenting stress (Befera & Barkley, 1985; Barkley, Fischer, Edelbrock, & Smallish, 1990). Family size may affect it as well, given that interactions between ADHD children and their siblings are often extremely negative in nature, which in turn correlates significantly with higher levels of parenting stress (Mash & Johnston, 1983b). Negative life events may also play a role (Campbell, Breaux, Ewing, Szumowski, & Pierce, 1986).

While acknowledging that parenting stress may stem from multiple sources, many investigators have nevertheless asserted that it is the child's ADHD and other clinically relevant child characteristics that are its primary determinants (Barkley, 1990; Fischer, 1990; Mash & Johnston, 1990). Indirect evidence supporting this contention comes from studies in which parent—child interactions were examined as a function of whether or not the child was on or off stimulant medication. Such studies have consistently shown that, as the child's ADHD symptoms improve while on medication, there are concomitant changes in parent behavior. In particular, parents issue fewer commands, voice less criticism, engage in more nondirective interactions, and express more warmth (Barkley, 1989; Schachar, Taylor, Wieselberg, Thorley, & Rutter, 1987). These changes in parenting style, following improvements in child behavior, presumably reflect decreased stress in the parenting role.

Although much progress has been made, our understanding of the factors that contribute to parenting stress within an ADHD population nevertheless remains incomplete. This would seem to stem, in part, from the numerous difficulties inherent in making cross-study comparisons. Fore-most among these are differences in defining parenting stress. Some investigators, for example, employed Abidin's (1986) Parenting Stress Index (PSI) (Mash & Johnston, 1983a), whereas others utilized less direct indices, such as the number of times that parents seek out mental health assistance (Gillberg et al., 1983). Additional variability exists with respect to the ADHD criteria used for subject selection.

Further limiting our understanding of the relationship between ADHD and parenting stress are various methodological concerns. These include the correlational nature of the reported findings, which makes it difficult to determine whether parenting stress follows or precedes the child's ADHD behavior. Also problematic is that in none of the published studies were attempts made to control for the overall severity of ADHD symptomatology, which clinical experience would suggest can be associated with elevated parenting stress. Of additional concern is that most did not control for the presence of various comorbid conditions, which are quite common among children with ADHD (Szatmari, Offord, & Boyle, 1989). Further complicating matters is that there has yet to be any systematic—that is, within the same experimental design—examination of the impact of various child, parent, and/or family–environment circumstances on overall parenting stress. Hence, it has been necessary to make inferences about the relative contributions of these factors primarily on the basis of cross-study comparisons.

In view of these circumstances, the purpose of the present study was to re-examine the relationship between ADHD and parenting stress. This was accomplished through a series of multiple-regression analyses, utilizing child, parent, and/or family–environment variables to predict parenting stress. Consistent with current theoretical notions of ADHD and prior research findings, it was hypothesized that child characteristics would account for a substantial amount of the variance in parenting stress. It was also predicted that, even when other child, parent, and family–environment variables are taken into account, the severity of the child's ADHD symptoms would contribute significantly to overall parenting stress.

METHOD
Subjects

The subjects were drawn from a pool of 200 consecutive referrals to a university medical center clinic, specializing in the assessment and treatment of ADHD. A total of 104 children and their mothers met the study's eligibility requirements and served as subjects. All of the children met DSM-III-R criteria for an ADHD diagnosis (APA, 1987), based on parent responses to interview questioning. Each child also had scores at or above the 93rd percentile (i.e., 1.5 standard deviations beyond the mean) on an age-appropriate rating scale measure of ADHD. For children 6 years of age and older, this requirement was met by T scores at or above 65 on either the Hyperactive dimension of the parent-completed Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1983) or the Inattentive/Nervous—Overactive dimensions of the teacher-completed CBCL (Edelbrock & Achenbach, 1984). Children below 6 had to have scores on the Impulsive—Hyperactive factor of the revised Conners Parent Rating Scale (Goyette, Conners, & Ulrich, 1978) that fell 1.5 standard deviations beyond their age and gender means.[1]

In addition to meeting the above ADHD criteria, all of the children were 12 years of age or younger. This constraint was imposed because the PSI typically is not administered to parents of teenagers. Each child also possessed at least low average intelligence, determined either from previously reported test findings or from screening results obtained during the intake assessment. For screened children 6 years of age and older, subtest scaled scores of 8 or above on the Vocabulary subtest of the Wechsler Intelligence Scale for Children-Revised (Wechsler, 1974) were required. Screened children younger than 6 had to have standard age scores of at least 42 on the Vocabulary portion of the Stanford Binet Intelligence Scale (4th ed.) (Thorndike, Hagen, & Sattler, 1986).[2] For all subjects, an additional eligibility requirement was that they could not have any evidence of severe sensory loss or language delay, cerebral palsy, pervasive developmental disorder, or psychosis.

The final sample included 87 boys and 17 girls, ranging in age from 49 to 145 months $(M = 99.9, SD = 22.8)$. All were in regular kindergarten through sixth-grade classrooms for their primary school placement. However, 68 were also receiving some type of part-time special education assistance. Twelve were on stimulant medication regimens; one was on an antidepressant. Six were adopted within 12 months of birth; the remainder were the biological offspring of their parents. All but 15 came from families in which there were 2 or more children. Fifty-seven were first-born children.

 The mothers in this study ranged in age from 23 to 48 years $(M = 34.5, SD = 5.3)$. Out of 75 mothers who were married, 67 were married to their child's biological father. Most had completed at least 12 years of schooling $(M = 13.6, SD = 2.3)$. Among the 60 mothers working outside of the home, 29 were working on a full-time basis.

The overall composition of the sample was middle class, as estimated by Hollingshead (1975) scores $(M = 51.2, SD = 26.5)$. Although predominantly Caucasian, the sample did include

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[1] At the time these data were collected, the parent-completed CBCL did not have a unique ADHD dimension for 4- to 6-year-old children, nor were normative data available for this age range on the teacher-completed CBCL. Subject selection for these younger children, therefore, was based on the revised Conners Parent Rating Scale, for which appropriate indices and norms were available.

[2] The Stanford-Binet was given to children 4 to 6 years of age, because the WISC-R does not have normative data available for this age group.

minority subjects, primarily from Hispanic origins. Generally speaking, this level of socioeconomic and minority representation paralleled that found in the surrounding community.

Diagnostic Procedures

Parent Interview. Information about the child's diagnostic status was obtained in part from parent responses to a semistructured psychiatric interview, similar to one that was designed specifically for use with ADHD populations (Barkley, 1990). In addition to evaluating the presence or absence of ADHD, this interview addressed many other DSM-III-R diagnoses, commonly encountered within ADHD populations. It also provided clinically relevant information pertaining to the child's developmental, school, peer, and family history.

Child Behavior Rating Scales. These measures were used to assess the degree to which reported ADHD symptoms deviated from developmental expectations. For 6- to 12-year-old children, *T* scores from the Hyperactive, Inattentive, and/or Nervous—Overactive dimensions of the Child Behavior Checklist (Achenbach & Edelbrock, 1983) were employed for this purpose. For children 4 to 6 years of age, this was addressed through their scores on the Impulsive—Hyperactive factor of the revised Conners Parent Rating Scale (Goyette et al., 1978). Scores at or above the 93rd percentile were considered to be developmentally deviant.

Predictor Variables Assessing Child Characteristics

Ten measures of child behavior, based upon mothers' perceptions, were included in the child prediction model.

Severity of ADHD. The overall frequency and severity of ADHD symptomatology was assessed via the total score from the ADHD Rating Scale (DuPaul, 1991). This scale contains the 14 ADHD behaviors described in DSM-III-R. Each item is rated on a 4-point scale, ranging from 0 *(not at all descriptive of the child)* to 3 *(very much descriptive of the child).* The total score is derived from summing the scores for each item.

Aggressive Behavior and Internalizing Problems. The impact of additional behavioral or emotional complications was addressed through two scores derived from the parent-completed CBCL. In particular, the Aggressive dimension and Internalizing *T* scores were used to measure the child's oppositional—defiant behavior and overall emotional functioning, respectively.

Peer Relations. Information pertaining to the child's peer relations was obtained from the parent interview. Two items were employed for this purpose: (1) Does your child have problems making friends? (2) Does your child have problems keeping friends? For each item, a response of *almost never* received a score of 0; *sometimes* was given a 1; *often* was scored 2. The two items were added together to generate a peer status score.

Health Status. The child's health status was assessed by means of parent responses to a 25-item health questionnaire. Each item was scored on a 3-point scale. If a particular health concern (e.g., allergies) had never been encountered, it received a score of 0; a 1 was given if it occurred in the past; a 2 was assigned if it was a present health concern. The scores for all 25 items were summed to generate an overall health status score.

Medication Status. Information about the child's medication status was derived from the parent interview. Of particular interest was whether or not the child was taking any stimulant or antidepressant medication for behavior management purposes. A score of 0 was given to children not taking medication; a 1 was scored for those on either medication.

Special Education Status. Input about the child's special education status was obtained from the parent interview and from teacher responses to the CBCL. If a child was in regular classes only, a score of 0 was given; a score of 1 was assigned to children receiving special education services.

Child Demographics. The child's chronological age, gender, and ordinal position were also included in this prediction model.

Predictor Variables Assessing Parent Characteristics
The parent prediction model was comprised of six variables, drawn from self-reports of maternal functioning.

Maternal Health, Depression, and Overall Psychopathology. These predictors were derived from the mothers' responses to the Symptom Checklist 90-Revised (SCL 90-R; Derogatis, 1983). The SCL 90-R is a 90-item self- report scale, reflecting a wide range of somatic complaints and adult psychopathology. Each item is rated on a 5-point scale according to how distressing it is for the respondent, ranging from 0 *(not at all)* to 4 *(extremely).* The SCL 90-R yields scores for nine primary symptom dimensions and for three global indices of distress. *T* scores from the Depression and Somatization subscales served as measures of maternal depression and maternal health status, respectively. *T* scores from the Global Severity Index (GSI), which reflects the total number of endorsed items and their reported severity, were used to estimate overall maternal distress or psychopathology.

Maternal Demographics. Maternal age, number of years of formal schooling, and job status were also part of this prediction model. For job status, a score of 0 was given to mothers not working outside of the home; a 1 was assigned to those working outside of the home on a part-time basis; and a 2 was assigned for those with full-time employment.

Predictor Variables Assessing Family Environment
Seven predictors were in the family-environment model.

Family Demographics. Included here were the number of children in the immediate family, the mother's current marital status, and the mother's relationship to the child's biological father. With respect to marital status, a score of 0 was assigned to mothers not married, a 1 to those currently married. Likewise, a 0 was given to mothers no longer involved with the child's biological father; those currently married to or in a relationship with the biological father received a 1.

Socioeconomic Status. The Hollingshead (1975) index served as a measure of the family's overall socioeconomic status (SES).

Psychosocial Stress. The PSI Life Stress Scale provided an estimate of the stress that mothers were experiencing, outside of the parent—child relationship. The 19 items (e.g., divorce) that

make up this optional subscale were scored 1 if they occurred during the past 12 months, or 0 if absent. None of these items was included in the calculation of the PSI's total stress score.

Problems Exhibited by Other Family Members. Mothers' interview responses served as a basis for determining whether or not siblings and/or fathers were affected by various psychiatric and medical conditions. A total of 21 potential problem areas were addressed, including ADHD, learning disabilities, antisocial personality, depression, anxiety, alcohol abuse, and epilepsy. Each item was scored 0 if absent, or 1 if present. Scoring was done separately for siblings and fathers. A total sibling status score was derived from summing across the 21 sibling items. The total father status score was calculated similarly. If there were no siblings or father in the family, a 0 was entered for total sibling status or for total father status, respectively.

Criterion Measure

Parenting Stress. The Parenting Stress Index (PSI; Abidin, 1986) served as the measure of overall stress within the parent–child system. Its selection was based upon a consideration of its excellent reliability and validity, and the fact that it has been used extensively in child and pediatric research, including studies involving ADHD populations (Mash & Johnston, 1983a).

The PSI contains 101 items, each of which is rated on a 5-point scale. The weighted item ratings are summed to generate a total stress score. Reflecting Abidin's view that many factors may contribute to this total stress score, the PSI also yields separate child and parent domain scores, as well as six Child and seven Parent Domain subscale scores. When added together, the subscales equal the sum of the child and parent domain scores, which in turn equals the total stress score.

As noted by Abidin (1986), some of these PSI subscales may tap into child and parent psychopathology. Thus, there was the possibility that they might share variance with some of the predictor variables. To the extent that this occurred, there would be unwanted overlap between the predictors and the total stress score, which would confound the planned analyses.

As a way of handling this potential problem, correlations were first calculated between the predictor variables in question and the corresponding PSI subscales with which they might share variance. This yielded the following results: $r = .64$ for the ADHD Rating Scale total and the PSI Distractibility/Hyperactivity subscale, $r = .68$ for the CBCL Aggressive T score and the PSI Demandingness subscale, $r = .60$ for the CBCL Internalizing T score and the PSI Mood subscale, $r = .25$ for the SCL 90-R GSI and the PSI Depression subscale, and $r = .45$ for the SCL 90-R Somatization score and the PSI Parent Health subscale. With the exception of the r between the SCL 90-R GSI and the PSI Depression subscale, all of these correlations were highly significant $(p < .001)$, thereby indicating a substantial amount of shared variance. As a way of making the PSI total stress score a purer measure of parenting stress—that is, one less affected by variance attributable to child and parent psychopathology—an adjusted total stress score was computed, equal to the total stress score minus the subscale scores for Distractibility/Hyperactivity, Demandingness, Mood, and Parent Health. This adjusted total stress score served as the criterion in the subsequent regression analyses.

Procedure

Each child subject underwent a comprehensive multimethod assessment (Barkley, 1990), consisting of parent- and teacher-completed child behavior rating scales, parent self-report rating scales, parent and child interviews, observational assessment, psychological testing, and school and medical record reviews. All phases of the evaluation were conducted by Ph.D. level psychologists, who possessed several years of postdoctoral experience working with ADHD populations.

The data collected from these multimethod assessments were analyzed in the following way. Given that the total number of predictor variables was larger than is usually acceptable for the number of subjects in this study, they were first grouped into conceptual categories. Three such categories were created, reflecting the underlying theoretical premises of this study. The first of these included the 10 variables measuring various child characteristics. The second was comprised of the six parent (i.e., maternal) variables. The third contained the seven family— environment variables. Each of these conceptual sets was then entered into separate stepwise multiple-regression analyses, in which the adjusted PSI total stress score served as the criterion. This allowed for an examination of how much the child, parent, and family—environment categories independently contributed to the variance in parenting stress. It also served to identify the significant predictors within each category.

Hierarchical multiple-regression analyses were performed next to address the joint contributions of these three domains. As before, the adjusted total stress score served as the criterion. In line with current theoretical notions about the etiology of parenting stress within an ADHD population (Mash & Johnston, 1990), child variables were entered first. Those emerging as significant predictors were forced into the second level of analysis. At this same level, the six parent variables were allowed to enter freely. The resulting combination of significant child and parent predictors was then forced into the third and final level of analysis, into which the seven family—environment variables were allowed to enter freely.

RESULTS
PSI Findings
Adjusted PSI total stress scores ranged from 92 to 274, with a mean of 182.0 and a standard deviation of 34.1. For comparison with prior research, unadjusted total stress scores were also calculated. These ranged from 144 to 396, with an overall mean and standard deviation of 267.1 and 47.2, respectively. Relative to those reported for the normative sample, such results reflect an extremely high level of parenting stress, falling slightly above the 90th percentile (Abidin, 1986).

Child, Parent, and Family–Environment Regression Models
Three child variables emerged as significant predictors of parenting stress: the CBCL Aggressive *T* score, the ADHD total score, and health status. Combined, these predictors accounted for 43% of the variance in the adjusted PSI total stress scores, $F (3, 100) = 25.12, p < .001$. These results indicate that elevated parenting stress is associated with more frequent aggressive behavior, more severe ADHD symptoms, and a higher incidence of child health problems.

For the parent model, two significant predictors—namely, the mothers' SCL 90-R GSI score and job status—accounted for 41% of the variance in the adjusted PSI total stress scores, $F (2, 101) =$

34.73, $p < .001$. This suggests that increased parenting stress occurs among mothers with more psychopathology, as well as mothers who are not working outside of the home.

Although no family–environment variable emerged as a significant predictor, a trend was detected. More specifically, current marital status accounted for 4% of the variance in adjusted PSI total stress scores, $F (1, 102) = 3.79$, $p < .06$. To the extent that this trend is reliable, it suggests that parenting stress is greater in single- vs. two-parent families.

Hierarchical Regression Model

The three significant child predictors namely, the CBCL Aggressive T score, the ADHD total score, and health status—represented the first level of analysis, accounting for 43% of the variance in adjusted PSI total stress scores. After forcing these three into the second level, the six parent variables were allowed to enter freely. This resulted in a combination model comprised of the three child variables, along with the mothers' SCL 90-R GSI and SCL 90-R Somatization scores. Together, these five variables accounted for 56% of the variance in adjusted PSI total stress scores, $F (5, 98) = 25.49$, $p < .001$. Hence, the addition of the two parent variables allowed for a 13% increase in the amount of explainable parenting stress variance, above and beyond that due to child factors alone. For the third and final level of analysis, the five child and parent variables were forced into regression, after which the seven family–environment variables were allowed to enter freely. Adding these seven did not lead to any significant increase, above and beyond the 56% of the variance already explained by the combination child—parent model.

Appearing in Table I is a summary of the cumulative variance accounted for at each step in the above hierarchical regression analysis. As may be seen from this table, CBCL Aggressive scores entered first and accounted for a majority of the variance in parenting stress attributable to child factors. Although not allowed to enter into regression until step 4, the mothers' SCL 90-R GSI scores nevertheless accounted for a sizable amount of variance, which was greater than that occurring not only at step 5 where the other parent variable (i.e., SCL 90-R Somatization) entered, but also at steps 2 and 3, where the other two child variables (i.e., ADHD total score, health status) entered.

Appearing in Table II is a summary of the intercorrelations among the five predictor variables and the adjusted PSI total stress score. All of the correlations between these predictors and the PSI criterion were highly significant, $p < .001$.

Impact of Comorbidity

Because elevated CBCL Aggressive T scores are often found among children carrying a diagnosis of oppositional defiant disorder (ODD), additional statistical analyses were performed to evaluate the relationship of this comorbid condition to overall parenting stress. This was accomplished in the following way. First, the 104 subjects were subdivided into groups according to their diagnostic status. One was comprised of children $(n = 59)$ carrying just an ADHD diagnosis; the other group included children

Table I. Summary of Hierarchical Regression Analysis of Adjusted PSI Total Score[a]

Step[b]	Variable entered	Cumulative multiple R^2
1	CBCL Aggressive T score	.37
2	ADHD Rating Scale total	.41
3	Child's health status	.43
4	SCL 90-R General Severity Index	.54
5	SCL 90-R Somatization	.56

[a]*Note*: PSI = Parenting Stress Index; CBCL = Child Behavior Checklist; ADHD = attention deficit hyperactivity disorder; SCL 90-R = Symptom Checklist 90-Revised.
[b]Steps 1, 2, and 3 were forced.

Table II. Correlations Among Hierarchical Predictors and Adjusted PSI Total Stress Score[a]

	Measure	1	2	3	4	5	6
1.	Adjusted PSI total stress	—					
2.	CBCL Aggressive	$.61^b$	—				
3.	ADHD Rating Scale total	$.50^b$	$.54^b$	—			
4.	Child health Status	$.37^b$	$.33^c$	$.31^c$	—		
5.	SCL 90-R General Severity Index	$.62^b$	$.47^b$	$.38^b$	$.29^c$	—	
6.	SCL-90-R Somatization	$.46^b$	$.52^b$	$.37^b$	$.30^c$	$.77^b$	—

[a]*Note*: PSI = Parenting Stress Index; CBCL = Child Behavior Checklist; ADHD = attention deficit hyperactivity disorder; SCL 90-R = Symptom Checklist 90-Revised.
[b]$p < .001$.
[c]$p < .01$.

(n = 32) with a dual diagnosis of ADHD and ODD, as defined by DSM-III-R criteria. Subjects not falling into either of these diagnostic categories were excluded from further analyses. Independent t-test comparisons of the ADHD and ADHD/ODD subgroups were then performed, using the child domain, parent domain, total stress, and adjusted total stress scores from the PSI. A summary of these findings appears in Table III. For all 4 PSI indices, there were statistically significant differences between the groups, with the ADHD/ODD group displaying relatively higher levels of parenting stress. In comparison with the normative sample (Abidin, 1986), the total stress scores for the ADHD and ADHD/ODD subgroups fell at approximately the 80th and 95th percentiles, respectively.

DISCUSSION
The results of this study are consistent with prior research, showing that extremely high levels of parenting stress exist within an ADHD population (Breen & Barkley, 1988; Mash & Johnston, 1983a). When examined separately in stepwise multiple-regression analyses, child (43%) and parent (41%) variables alone accounted for far more of the variance in overall parenting stress than did family—environment variables (4%). A similar pattern of findings emerged from the hierarchical regression analyses, which resulted in a combination model explaining 56% of the variance. Of the five significant predictors in this model, three were from the child domain and two were parent variables.

Table III. Comparison of PSI Results by Child Diagnostic Group[a]

PSI measure	ADHD[b]		ADHD/ODD[c]		
	M	SD	M	SD	t
Child Domain	126.9	21.9	155.6	20.9	6.07[d]
Parent Domain	123.8	26.6	137.8	24.7	2.46[e]
Total score	250.7	43.6	293.4	40.7	4.57[d]
Adjusted total score	171.5	32.2	198.3	31.1	3.84[d]

[a]*Note.* PSI = Parenting Stress Index.
[b]ADHD = subjects with diagnosis of attention deficit hyperactivity disorder, $n = 59$.
[c]ADHD/ODD = subjects with dual diagnosis of ADHD and oppositional defiant disorder (ODD), $n = 32$.
[d]$p < .001$.
[e]$p < .05$.

As predicted, the overall severity of the child's ADHD was one of the significant predictors. That this would occur within a sample of children displaying a relatively restricted range of ADHD symptomatology—that is, above the 93rd percentile—is especially striking. This lends further credence to the contention that the child's ADHD exerts a powerful influence on parenting stress (Mash & Johnston, 1990). An even more potent predictor, however, was the child's aggressive and oppositional–defiant behavior, which entered the regression equation first, accounting for 37% of the variance. Further attesting to the clinical importance of these secondary behavioral features were the t-test results, which showed significantly higher parenting stress scores for children with a dual diagnosis of ADHD and oppositional defiant disorder, vs. those with just an ADHD diagnosis alone. Although not surprising in view of previously reported findings (Tallmadge et al., 1989), these results nevertheless highlight the rather strong association between aggressive child behavior and parenting stress. The other significant child predictor, health status, explained relatively less variance. Its inclusion as a predictor nonetheless is in line with prior pediatric research (Bendell et al., 1986; Frank et al., 1991) and further highlights the important role played by comorbid conditions within the ADHD population.

Maternal health and psychopathology were the only other significant predictors to emerge from the hierarchical regression analyses. Maternal psychopathology in particular was a powerful predictor, accounting for a sizable amount of the variance, second only to that explained by aggressive child behavior. Consistent with earlier research (Cunningham et al., 1988), this suggests that the overall level of psychopathology reported by mothers greatly influences the amount of stress that they experience in their parenting roles.

Exactly how these parental factors exert their influence is not entirely clear. Their presence may, for example, introduce unrealistic, negative bias into parental perceptions of child behavior or alter parental cognitions in other ways, thereby exacerbating parenting stress (Mash & Johnston, 1990). Another possibility is that they may bring about changes in parenting behavior. As parents direct more time and energy to coping with psychological problems and/or health difficulties, less time and energy may be available for parenting. Under such circumstances, parents may inadvertently ignore positive child behavior, unintentionally overreact to negative child behavior, or respond inconsistently to both. This style of parenting increases the likelihood that child behavior problems will intensify, which in turn increases parenting stress.

In summary, the findings from this study suggest that child and parent characteristics, more so than family—environment circumstances, are associated with the higher levels of parenting stress that are commonly found among ADHD populations. What cannot be ascertained, however, due to the correlational nature of this investigation, is whether these same child and parent factors directly cause parenting stress. Additional research, therefore, must be conducted.

To the extent that it is appropriate to assume that a causal relationship does exist, the obtained findings can serve to increase our understanding of how parenting stress might arise within the ADHD population. This in turn has implications for clinical management. For example, the fact that parenting stress can be quite high within an ADHD population requires that some effort be made to assess its presence and overall severity during initial evaluations. Furthermore, clinicians who focus therapeutic attention solely on the child's ADHD symptoms may find that the parents of such a child continue to experience high levels of parenting stress. This may occur because other psychosocial influences, such as the child's oppositional—defiant behavior or the parent's own personal difficulties, may be at work. This possibility highlights the importance of assessing not only the child's ADHD but also potential comorbid child conditions and parental psychopathology. Should such complications be present, clinicians may then need to focus attention on these other areas of clinical concern, in order to bring about further therapeutic improvements.

Prior to concluding, certain methodological limitations inherent in this study should be noted. For example, although the sample was larger than those in most other investigations of this type, it was not large enough to allow for the simultaneous examination of all of the child, parent, and family—environment variables of interest. Not having input from fathers further limits any conclusions that may be drawn. In a similar vein, the absence of a non-ADHD clinic-referred control group makes it difficult to determine whether the obtained results are specific to ADHD populations, or just typical of clinic-referred child populations in general.

The selected criterion and predictor variables may also place limits on the generalizability of these findings. Some might argue, for example, that the PSI is not the best way to operationalize parenting stress. Any disadvantages to using this measure, however, would seem to be more than offset by its numerous strengths, which include its excellent psychometric properties and the extensive body of research attesting to its construct validity (Abidin, 1986). Although this study utilized a fairly representative range of predictors, it did not include certain variables (e.g., marital dysfunction) which prior research has shown to be related to parenting stress. Had such variables been incorporated, they may have emerged as significant predictors, thereby altering the degree to which the child, parent, and family—environment domains accounted for the variance in overall parenting stress. Another possible limitation is that the assessment of certain predictor variables (e.g., peer relations) could have been improved through the use of more refined measures of these constructs. The fact that such variables did not enter into the final prediction equation, therefore, may reflect inadequacies in the way that they were operationalized, rather than their failure to contribute significantly to the prediction of parenting stress.

Bearing in mind such limitations, the present results nevertheless shed new light on the relationship between parenting stress and ADHD. Building upon this investigation, subsequent research presumably will lead to an even better understanding of this important clinical area.

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