PERGAMON

Behaviour Research and Therapy 39 (2001) 731–743

BEHAVIOUR RESEARCH AND THERAPY

www.elsevier.com/locate/brat

Validity of the parenting scale for parents of children with attention-deficit/hyperactivity disorder

Elizabeth Harvey [a,*], Jeffrey S. Danforth [b], Wendy R. Ulaszek [c], Tara L. Eberhardt [c]

[a] *Department of Psychology, University of Massachusetts, Tobin Hall, Box 37710, Amherst, MA 01003-7710, USA*
[b] *Department of Psychology, Eastern Connecticut State University, Willimantic, CT 06226-2295, USA*
[c] *Department of Psychology, University of Connecticut, 406 Babbidge Road, U-20, Storrs, CT 06269, USA*

Received 11 November 1999; accepted 28 March 2000

Abstract

The present study examined the validity of the parenting scale for parents of elementary school-aged children with attention-deficit/hyperactivity disorder (ADHD). Parents from 109 families with children who had been diagnosed with ADHD (106 mothers and 93 fathers) and from 70 families with non-problem children (69 mothers and 59 fathers) completed the parenting scale and reported on their children's behavior problems. Factor analyses revealed two interpretable factors for both mothers and fathers, corresponding to the overreactivity and laxness factors identified in previous studies of the parenting scale. Overreactivity and laxness scores were significantly higher for mothers and fathers of ADHD children than of non-ADHD children; this effect appeared to be accounted for by comorbid aggression and conduct problems among ADHD children. Results support the validity of the parenting scale for use with parents of ADHD children.

Keywords: Parenting skills; Behavior problems; ADHD; Children; Measurement

1. Introduction

Attention-deficit/hyperactivity disorder (ADHD) is characterized by chronic, clinically significant levels of inattention, hyperactivity, and impulsivity. It affects approximately 3–5% of school-aged children and is disproportionately represented among males (American Psychiatric Association, 1994). It is thought to be a developmental disorder that stems from neurological dysfunction

* Corresponding author. Tel.: +1-413-545-0073; fax: +1-413-545-0996.
E-mail address: eharvey@psych.umass.edu (E. Harvey).

0005-7967/01/$ - see front matter
PII: S0005-7967(00)00052-8

caused by biological and genetic factors (Barkley, 1990). The disorder typically causes significant impairment across many domains; ADHD children often have considerable difficulty with academic performance and social and family relationships (Frick et al., 1991; Gaub & Carlson, 1997; Johnston, 1996). They are also at risk for developing a variety of comorbid psychiatric disorders including conduct disorder (CD) and oppositional defiant disorder (ODD; Barkley, DuPaul & McMurray, 1990; Barkley, Fischer, Edelbrock & Smallish, 1990; Szatmari, Boyle & Offord, 1989), which may cause even greater maladjustment.

Theory and research suggest that parenting behavior may play an important role for ADHD children. Although many researchers do not believe that parental discipline plays a large etiological role in the development of ADHD per se (e.g., Barkley, 1998; Whalen & Henker, 1998), discipline is thought to play an important role in managing ADHD symptoms and in contributing to the development of ODD and CD among ADHD children (Barkley, 1990; Whalen & Henker, 1998). Observational studies have found differences between parents of ADHD and non-ADHD children and weaker parenting behavior is most pronounced among parents of ADHD children with comorbid ODD (Barkley, Fischer, Edelbrock & Smallish, 1991; Johnston, 1996; Lindahl, 1998; Loney, 1987; Stormont-Spurgin & Zentall, 1995). Theory and research suggest bi-directional influences with the behavior of ADHD children influencing the behavior of their parents, which in turn exacerbate ADHD symptoms and potentiate the development of ODD and CD in the child (see Danforth, Barkley, & Stokes, 1991, for a review). Furthermore, the effectiveness of parent training programs that focus on discipline of ADHD children (Danforth, 1998; Pisterman et al., 1989), provide strong support for the important role of discipline in managing ADHD symptoms and associated behavior problems.

Therefore, assessing discipline strategies of parents with ADHD children may be important both in clinical and research settings. Research in this field has relied primarily on observational measures of parenting. Developing measures that use other methods could enhance assessment of parental discipline. A self-report measure of discipline could complement observational assessments of parenting by providing a multi-method parenting assessment that would likely have more validity than using either measure alone (Mash & Terdal, 1997; Schwarz, Barton-Henry & Pruzinsky, 1985), or it could be used alone when cost-effectiveness is needed or when direct observation is not practical. However, there is currently no self-report measure of parental discipline that has been validated for use with parents of ADHD children.

The parenting scale is a self-report measure of parental discipline that has been validated on parents of preschool-aged children (Arnold, O'Leary, Wolff & Acker, 1993) and young adolescents (Irvine, Biglan, Smolkowski & Ary, 1999). This self-report scale provides a quick, cost-effective assessment of discipline practices, and has been shown to correlate highly with observational assessments of parenting (Arnold et al., 1993). It is potentially useful in clinical settings for identifying targets in parent training, and in research settings for understanding the correlates of parental discipline. This scale could have significant utility in work with elementary school-aged children both with and without ADHD; however, it has not yet been validated with this population.

The present study sought to evaluate the psychometric properties of the parenting scale among elementary school-aged children with and without ADHD. The validity of this scale was explored in several ways. The study first evaluated the construct validity of the scale by examining the factor structure of the measure in this population and comparing it to the factor structure found

in the parenting scale with other populations. Second, the discriminative validity of the scale was tested by comparing non-ADHD children to ADHD children both with and without ODD/CD. It was predicted that parents of ADHD children would report more problematic discipline than parents of non-ADHD children. It was also predicted that parents of children with comorbid ADHD and ODD/CD would report more problematic discipline practices than parents of both pure ADHD and non-ADHD children. Finally, reliability of the scale was examined by calculating the internal consistency of the scale.

2. Method

2.1. Participants

Participants were 109 families with children who had been diagnosed with ADHD (106 mothers and 93 fathers) and 70 families with non-problem children (69 mothers and 59 fathers). Target children in these families ranged in age from 5 to 12 (M=8 years 5 months). ADHD children were recruited from a specialty clinic serving ADHD children and through announcements in the community. Non-ADHD children were recruited through community announcements and through day-care centers. If a non-ADHD family had more than one child in the specified age range, one child was randomly selected to be the target child. Ninety-two percent of the ADHD children and 50% of the non-ADHD children were boys. Equal numbers of boys and girls were included in the non-ADHD group and analyses were then conducted to control for possible confounding effects of gender. This approach was chosen rather than matching for gender so that the results could guide the use of this scale not only with parents of ADHD children but also with parents of non-ADHD school-aged children. Thus, the descriptive statistics and factor analyses could be more readily generalized for use with a non-clinical population that would include both genders.

All ADHD children received a T-score of at least 65 on either the attention problems subscale of the child behavior checklist (CBCL; Achenbach, 1991; see below) or on the hyperactivity subscale of the behavior assessment system for children–parent report scale (BASC; Reynolds & Kamphaus, 1992; see below) based on the report of at least one parent. They also met either DSM-III-R or DSM-IV (American Psychiatric Association, 1994) criteria for ADHD based on either the diagnostic interview schedule for children (DISC-IV; Shaffer, Fisher, Lucas, Dulcan & Schwab-Stone, 2000) or a semi-structured interview, similar to one that Barkley (1990) designed specifically for ADHD populations. Thirty-nine of the ADHD children also had T-scores greater than 65 on the aggression or conduct problems subscale of the BASC or the aggression or delinquent subscale of the CBCL based on the report of at least one parent. They also met DSM-III-R or DSM-IV criteria for ODD or CD based on the DISC-IV or the semi-structured interview. All non-ADHD children had T-scores less than or equal to 60 on all of the externalizing scales of the BASC based on the report of both parents.

Demographic information for the sample is presented in Table 1 by diagnostic group. Families with ADHD children and families with non-ADHD children did not differ significantly on children's, mothers', or fathers' ages. However, in non-ADHD families, parents had significantly more education and higher family income. The ethnic background of almost all parents was Euro–American.

Table 1
Demographic information for total sample, ADHD, and non-ADHD children

Variable	Non-ADHD		ADHD		Total		Univariate F[a] (df)
	M	SD	*M*	SD	*M*	SD	
Child's age (months)	99.9	19.4	103.7	21.1	102.2	20.5	1.51 (1, 177)
Mothers' education (years)	16.0	2.4	14.4	2.2	15.0	2.4	21.94 (1, 169)***
Fathers' education (years)	15.7	3.0	14.4	2.5	14.9	2.8	9.95 (1, 165)**
Mothers' age (years)	38.2	5.1	37.0	5.5	37.5	5.4	2.34 (1, 172)
Fathers' age (years)	40.4	6.5	38.9	6.4	39.5	6.5	2.39 (1, 167)
Family income (US$1000)	86.0	33.6	57.5	29.2	68.6	32.9	32.35 (1, 160)***
		n=70		*n*=109		*n*=179	

[a] Significance tests evaluated differences between ADHD and non-ADHD groups. $^{**}p<0.01$, $^{***}p<0.001$.

2.2. Measures

Parents provided basic demographic information and completed the following scales independently.

2.2.1. The parenting scale

The parenting scale (Arnold et al., 1993) is a 30-item self-report scale of parental discipline. Parents indicate their tendencies to use specific discipline strategies using 7-point Likert scales, where 7 indicates a high probability of making the discipline mistake and 1 indicates a high probability of using an effective, alternative discipline strategy. Factor analyses on parents of preschoolers revealed three factors: overreactivity, laxness, and verbosity. The verbosity factor was less robust than the overreactivity and laxness factors. The scale has good internal consistency (0.84) and is associated with behavioral observations of parenting in younger children (Arnold et al., 1993). It has not yet been validated on ADHD children, nor on elementary school-aged children, however, the items have face-validity for this age range.

2.2.2. BASC

The BASC (Reynolds & Kamphaus, 1992) is a comprehensive parent rating scale that assesses a broad range of child psychopathology in children aged 2 years 6 months and older. It yields hyperactivity, aggression, and conduct problems subscales for children ages 6 and above. Research on the BASC suggests that it has excellent reliability and validity (Reynolds & Kamphaus, 1992), particularly with ADHD children (Ostrander, Wienfurt, Yarnold & August, 1998).

2.2.3. CBCL

The CBCL is a commonly used parent rating scale of child psychopathology which has adequate reliability and validity (Achenbach, 1991). It contains an attention problems subscale, which assesses difficulties with inattention and hyperactivity, as well as aggression and delinquent behavior subscales.

All non-ADHD families completed the BASC, 63 of the ADHD families completed the BASC,

and 46 of the ADHD families completed the CBCL. These data were collected as part of three separate projects; the first project used the CBCL and the second two replaced the CBCL with the BASC, a recently developed measure comparable to the CBCL.

2.2.4. Diagnostic interview schedule for children-revised (DISC-IV)

The DISC-IV was administered to parents of most of the ADHD children (the parents of remaining children were administered Barkley's (1990) semi-structured interview; see above). The DISC-IV has demonstrated adequate reliability and validity for elementary school aged children (Shaffer et al., 2000).

3. Results

3.1. Construct validity: factor structure of the parenting scale

A principal components factor analysis using varimax normalized rotation was conducted for mothers and fathers separately. A varimax rotation rather than oblique rotation was used for two reasons. First, previous studies of the parenting scale (Arnold et al., 1993; Irvine et al., 1999) used a varimax rotation (Irvine et al., 1999 initially used an oblique rotation, but found a low correlation between the two factors and therefore used a varimax rotation for the final analyses). Therefore, using the same method would make comparisons among these studies more straightforward. Second, an oblique rotation would capitalize on sample specific covariance of the factors. An exploratory, rather than confirmatory, factor analysis was conducted because of the relatively small sample size and because the two previous studies examining the factor structure of this scale with other populations found different results.

The ADHD and non-ADHD samples were combined for the factor analysis for two reasons. First, there was not a theoretically compelling reason for conducting separate factor analyses. Second, when separate factor analyses were conducted, the results were quite similar to those found with the sample as a whole. The factor structures for the whole sample were almost identical to the structures for the parents of children with ADHD. Cattell's similarity indices (Cattell, Balcar, Horn & Nesselroade, 1969) were 1.0 and 0.96 for fathers' laxness and overreactivity, respectively and 1.0 for both mothers' laxness and overreactivity. When comparing the factor structures of the non-clinical sample to the whole sample, Cattell's similarity indices were also high (0.82 and 0.76 for fathers' laxness and overreactivity, respectively and 0.73 and 0.62 for mothers' laxness and overreactivity, respectively).

Scree tests for both mothers and fathers suggested two factors. The first factor contained items that appeared to assess lax parenting and explained 18% and 17% of the variance for mothers and fathers, respectively. The second factor contained items that appeared to measure overreactive or harsh discipline and explained 14% and 16% of the variance for mothers and fathers, respectively. For mothers all but six items and for father all but seven items loaded 0.40 or higher on one of these two factors; items 13, 23, 27, and 29 did not load on a factor for either mothers or fathers, items 5 and 15 did not load for mothers, and items 4, 11, and 24 did not load for fathers. In the previous analysis with preschool children (Arnold et al., 1993), four of these items (4, 11, 23, and 29) loaded on the verbosity factor and three of these items (5, 13, and 27) did not load

on any factor. Items and their factor loadings are presented in Table 2. Items that loaded 0.40 or higher on a factor were used to create factor scores for each parent. Cattell's similarity indexes indicated that the items loading on each factor were similar for mothers and fathers for both overreactivity (0.90) and laxness (0.81). The factor structure for mothers in this sample was similar, but not identical to that found in mothers of preschool children (Arnold et al., 1993; Cattell's similarity indexes were 0.95 for overreactivity and 0.69 for laxness) and in parents (primarily mothers) of middle-school children (Irvine et al., 1999; Cattell's similarity indexes were 0.95 for overreactivity and 0.72 for laxness).[1] The verbosity factor found in previous studies (Arnold et al., 1993; Irvine et al., 1999) did not emerge in the present sample. Five of the items from Arnold et al's (1993) verbosity factor loaded on the laxness factor for mothers in this sample (items 2, 4, 7, 9 and 11) and two of the original verbosity items (2 and 7) loaded on the laxness factor for fathers in the present sample. The remaining two verbosity items (23 and 29) did not load on either of the two factors obtained in this sample.

3.2. Reliability: internal consistency

For mothers, Cronbach's alphas were 0.87, 0.85, and 0.84 and for fathers, they were 0.84, 0.84, and 0.82 for the total scale, laxness scale, and overreactivity scale respectively, suggesting good internal consistency of the scale.

3.3. Discriminant validity: comparison of parents of ADHD with non-ADHD children

One-way analyses of variance were conducted to compare parenting scale overreactivity, laxness, and total scores of parents of all male and female ADHD and non-ADHD children (see top of Table 3). Because ADHD and non-ADHD children differed in family income, mother's education, and father's education, these three variables were entered as covariates to ensure that parenting differences were not accounted for by group demographic differences. ANCOVAs revealed that mothers' and fathers' total scores and mothers' overreactivity scores were significantly higher in the ADHD group using a Bonferroni correction. The difference for fathers' overreactivity scores approached significance (p=0.008). The average effect size for the differences for mothers was 0.60 and for fathers was 0.52, indicating medium-sized effects. Because there were more girls in the non-ADHD group than in the ADHD group, these analyses were also conducted for boys only to control for gender (see bottom of Table 3). These analyses revealed that mothers' and fathers' total scores and overreactivity scores were significantly higher in the ADHD group using a Bonferroni correction when income and education were entered as covariates. Mothers' laxness scores were higher among the ADHD sample at a probability level (p=0.004) that was nearly significant using a Bonferroni correction.

Next, two groups of ADHD children were compared separately to the non-ADHD children. An *ADHD/ODD/CD* group consisted of ADHD children who received a *T*-score of at least 65 on either the aggression or delinquent behavior subscales of the CBCL or on either the aggression

[1] Irvine et al. (1999) only included items with factor loadings greater than 0.55. The calculations for Cattell et al.'s similarity index also included items that loaded at least 0.40 to be consistent with the cutoff used in the present study (and more congruent with the 0.35 cutoff used by Arnold et al., 1993).

Table 2
Parenting scale factor structure

Item	Factor loading			
	Mothers		Fathers	
	Factor 1 (laxness)	Factor 2 (overreactivity)	Factor 1 (laxness)	Factor 2 (overreactivity)
16. When my child does something I don't like … I often let it go.	0.66[a]	0.07	0.61[a]	−0.17
19. When my child doesn't do what I ask … I often let it go or end up doing it myself	0.66[a]	0.08	0.63[a]	0.30
12. When I want my child to stop doing something … I coax or beg my child to stop.	0.64[a]	0.00	0.65[a]	0.12
21. If saying no doesn't work … I offer my child something nice so he/she will behave.	0.63[a]	−0.02	0.48[a]	0.19
26. When I say my child can't do something … I let my child do it anyway.	0.62[a]	0.34	0.71[a]	0.25
20. When I give a fair threat or warning I often don't carry it out.	0.61[a]	0.30	0.68[a]	0.02
30. If my child gets upset when I say "No" … I back down and give in to my child.	0.60[a]	0.13	0.67[a]	0.32
8. I am the kind of parent that … lets my child do whatever he or she wants.	0.57[a]	0.36	0.55[a]	0.18
11. If saying no doesn't work right away … I keep talking and try to get through to my child.	0.57[a]	−0.01	0.31	−0.36
7. I threaten to do things that … I know I won't actually do.	0.53[a]	0.36	0.52[a]	0.27
2. Before I do something about a problem … I give my child several reminders or warnings.	0.53[a]	0.36	0.47[a]	−0.09
1. When my child misbehaves … I do something about it later.	0.48[a]	0.13	0.60[a]	0.07
9. When my child misbehaves … I give my child a long lecture.	0.48[a]	0.26	0.05	0.43[a]
24. If my child misbehaves and then acts sorry … I let it go that time.	0.46[a]	−0.03	0.34	0.39
4. When I tell my child not to do something … I say a lot.	0.43[a]	0.25	0.12	0.17
15. When we're not at home … I let my child get away with a lot more.	0.39	0.33	0.56[a]	0.31
22. When my child misbehaves … I get so frustrated or angry that my child can see I'm upset.	0.13	0.73[a]	0.05	0.69[a]
17. When there's a problem with my child … things build up and I do things I don't mean to do.	0.21	0.69[a]	0.31	0.71[a]
10. When my child misbehaves … I raise my voice or yell.	0.08	0.68[a]	−0.02	0.62[a]
18. When my child misbehaves, I spank, slap, grab, or hit my child … most of the time.	−0.02	0.68[a]	0.12	0.62[a]

(continued on next page)

Table 2 (*continued*)

Item	Factor loading			
	Mothers		Fathers	
	Factor 1 (laxness)	Factor 2 (overreactivity)	Factor 1 (laxness)	Factor 2 (overreactivity)
6. When my child misbehaves … I usually get into a long argument with my child.	0.38	0.59[a]	0.30	0.51[a]
28. When my child does something I don't like, I insult my child, say mean things, or call my child names … most of the time.	0.19	0.54[a]	0.28	0.51[a]
25. When my child misbehaves … I almost always use bad language.	0.20	0.53[a]	0.13	0.45[a]
3. When I'm upset or under stress … I am picky and on my child's back.	0.15	0.45[a]	0.08	0.66[a]
14. After there's been a problem with my child … I often hold a grudge.	0.21	0.43[a]	0.13	0.49[a]
5. When my child pesters me … I can't ignore the pestering.	−0.02	0.30	0.01	0.65[a]
13. When my child is out of my sight … I often don't know what my child is doing.	0.07	0.34	0.28	0.18
23. When my child misbehaves … I make my child tell why he/she did it.	−0.01	0.07	0.01	0.02
27. When I have to handle a problem … I tell my child I'm sorry about it.	0.03	0.15	0.19	0.18
29. If my child talks back or complains when I handle a problem … I give my child a talk about not complaining.	0.26	0.26	−0.01	−0.06

[a] Indicates items with loadings of 0.40 or higher.

Table 3
Comparison of parenting scale scores in ADHD vs non-ADHD families[a]

Parenting scale score	Mothers			Fathers		
	ADHD	Non-ADHD	Univariate	ADHD	Non-ADHD	Univariate
	M (SD)	*M* (SD)	*F* (1, 170)	*M* (SD)	*M* (SD)	*F* (1, 147)
Boys and girls combined						
Laxness	2.97 (0.83)	2.66 (0.65)	5.47*	2.74 (0.86)	2.39 (0.66)	6.78*
Overreactivity	3.40 (0.91)	2.81 (0.70)	16.23***[b]	3.40 (0.93)	3.01 (0.79)	7.18**
Total	3.23 (0.69)	2.83 (0.52)	12.84***[b]	3.23 (0.63)	2.90 (0.57)	11.53***[b]
	n=106	*n*=69		*n*=93	*n*=59	
Boys only						
Laxness	2.97 (0.82)	2.49 (0.57)	8.45**	2.77 (0.87)	2.39 (0.71)	5.98*
Overreactivity	3.41 (0.88)	2.69 (0.73)	16.17***[b]	3.44 (0.92)	2.90 (0.82)	10.61**[b]
Total	3.22 (0.66)	2.68 (0.48)	16.19***[b]	3.25 (0.64)	2.85 (0.61)	12.14***[b]
	n=97	*n*=34		*n*=87	*n*=32	

[a] Significance tests were conducted separately for mothers and fathers, comparing parents of ADHD and non-ADHD children with family income and mothers' and fathers' education entered as covariates. *$p<0.05$; **$p<0.01$; ***$p<0.001$.

[b] Indicates comparisons that are significant using a Bonferroni correction (alpha set at 0.004).

or conduct problems subscales of the BASC and who met criteria for ODD/CD based on a diagnostic interview. A *pure ADHD* group consisted of children who had not been diagnosed with ODD or CD and who did not receive a *T*-score above 60 on the aggression or delinquent behavior subscales of the CBCL or on the aggression or conduct problems subscales of the BASC. The means for these three groups are presented in Table 4. The Tukey Honestly Significant Difference test for unequal *n*s was conducted to compare these means. Parents' education and family income were entered as covariates in these analyses. For all dependent variables, mothers of ADHD/ODD/CD children scored significantly higher than mothers of non-ADHD children and mothers of pure ADHD children. Fathers of ADHD/ODD/CD children scored significantly higher than fathers of non-ADHD children on all dependent variables, and scored significantly higher than fathers of pure ADHD children on overreactivity. These differences appeared to be clinically as well as statistically significant. The average effect size of the significant differences was 1.08 for mothers and 0.84 for fathers, indicating large effect sizes. There were no significant differences between parents of pure ADHD children and parents of non-ADHD children. These results remained significant when analyses were conducted for boys only, with the exception of two findings which approached significance (p=0.01 and p=0.02): the difference between the ADHD/ODD/CD and non ADHD groups for fathers' laxness and the difference between the ADHD/ODD/CD and pure ADHD group for mothers' laxness. Thus, it appears that the relation between parental discipline and ADHD is best accounted for by comorbid conduct problems among ADHD children.

Table 4
Comparison of non-ADHD, pure ADHD, and ADHD/ODD/CD children on parenting scale scores[a]

	Non-ADHD *M* (SD)	Pure ADHD *M* (SD)	ADHD/ODD/CD *M* (SD)	(HSD Test[b])
Mothers				
Laxness	2.66 (0.65)	2.57 (0.85)	3.26 (0.78)	(3>1, 2***[c])
Overreactivity	2.81 (0.70)	2.76 (0.73)	3.82 (0.94)	(3>1, 2***[c])
Total	2.83 (0.52)	2.75 (0.66)	3.50 (0.68)	(3>1, 2***[c])
	n=69	*n*=24	*n*=37	
Fathers				
Laxness	2.39 (0.66)	2.76 (0.77)	3.01 (1.16)	(3>1**[c])
Overreactivity	3.01 (0.79)	2.91 (0.87)	3.69 (0.79)	(3>1, 2**[c])
Total	2.90 (0.57)	3.09 (0.62)	3.46 (0.69)	(3>1***[c])
	n=59	*n*=23	*n*=28	

[a] 1=non-ADHD, 2=ADHD, 3=ADHD/ODD/CD. ***$p<0.001$; **$p<0.01$.
[b] Tukey Honestly Significance tests comparison of means.
[c] Indicates comparisons that are significant using a Bonferroni correction for multiple comparisons (alpha set at 0.008).

4. Discussion

The present study examined the psychometric properties of the parenting scale among parents with elementary school-aged children both with and without ADHD. This study is the first to examine the value of the parenting scale with parents of elementary school-aged children and the first to examine its use with children with ADHD. Two of the three factors identified in parents of preschoolers (Arnold et al., 1993) were also identified in this elementary school-aged sample. The first factor, laxness, contained items describing permissive, inconsistent parenting. The second factor, overreactivity, contained items describing harsh parenting. The total scale and both factors demonstrated good internal consistency. The verbosity factor identified in preschoolers did not emerge in this sample; however it was not a robust factor in the preschool sample and has also not been found in a young adolescent population (Irvine et al., 1999). The scale also demonstrated good discriminative validity; parenting scale scores were higher among parents of ADHD children than among parents of non-ADHD children. However, this was true only for ADHD children who also displayed high levels of aggression or delinquent behavior. Parents of children with pure ADHD reported using parenting strategies similar to those reported by parents of non-ADHD children.

The scale appeared most valuable in distinguishing parents of ADHD children with comorbid behavior problems from parents of non-ADHD children and pure ADHD children. This is consistent with research suggesting that children with comorbid ADHD/ODD display a distinctive pattern of dysfunction (Hinshaw, 1994). The parenting scale has the potential to be clinically useful in identifying parents of ADHD children whose discipline skills may exacerbate ADHD children's hyperactivity or lead to the development of comorbid conduct problems. The scale might also be helpful in identifying the parenting skills that most need to be targeted for an individual parent. Normative data on the parenting scale is needed in order to do this. The scale could also comp-

lement observational assessments of parenting in providing a multimethod parenting assessment, or it could be used alone when cost-effectiveness is important. Finally, the parenting scale could prove useful in research analyzing the causes and effects of parenting ADHD children.

These findings are consistent with studies that have found parenting differences between ADHD/ODD children and non-problem children, but not between pure ADHD children and controls (Barkley et al., 1991; Hinshaw, 1994; Loney, 1987; Stormont-Spurgin & Zentall, 1995). For example, findings by Barkley et al. (1991) suggest that mothers of ADHD/ODD adolescents frequently used put-downs. Such parenting responses may be consistent with items that loaded on the Overreactivity factor in this study. Additionally, Danforth (1998, 1999) found that parents of ADHD/ODD children rarely, if ever, provide reprimands contingent upon child non-compliance. Such parenting behavior may be consistent with items that loaded on the laxness factor in this study. However, the present study suggests more clearly than many previous studies that parents of ADHD/ODD children may use more ineffectual discipline. Previous studies have tended to examine parenting variables that combined effective and less effective parenting strategies. For example, Barkley et al. (1991) combined 'commands' and 'put downs' into one category, making it unclear whether the observed group difference reflects greater use of commands, greater use of put-downs, or both. Issuing more commands could be an effective way of dealing with child behavior, whereas, using put-downs is a form of harsh parenting, which is thought to negatively affect child behavior. The present study more specifically identified elevations in discipline 'mistakes', rather than simply elevations in command frequency. These findings provide stronger support for theories that suggest that problematic parenting contributes to the development of aggression and conduct problems among ADHD children and exacerbates ADHD symptomatology, but does not influence the development of ADHD itself (Barkley, 1998).

Differences between diagnostic groups on the parenting scale were found for mothers and fathers, particularly differences between the ADHD/ODD/CD and non-ADHD group. However, it appeared that the parenting scale scores of fathers of pure ADHD children fell between those of fathers of non-ADHD and ADHD/ODD/CD children, whereas the parenting scale scores of mothers of pure ADHD children were more comparable to those of mothers of non-ADHD children. This gender difference in parenting may be due to a gender difference in ADHD symptomatology. Just as ADHD is more commonly found among boys, ADHD symptoms may be more prevalent among fathers than among mothers. Thus, the pure ADHD children may be more likely than non-ADHD children to have fathers with ADHD symptoms, and fathers' ADHD symptoms may contribute to ineffective discipline. More research is needed to explore this possibility and examine the relation between adult ADHD symptomatology and parenting.

This study is limited by the lack of observational data to support the validity of the parenting scale. In addition, the homogeneity of the sample with respect to socio-economic status and ethnicity limits the generalizability of these findings. Parents in the present study had higher than average education and income, particularly in the non-ADHD sample. However, these demographic variables did not appear to account for group differences in discipline, and the results of the present study are similar to those found in previous studies with families of lower income and education (Arnold et al., 1993; Irvine et al., 1999). Ethnic minority families are poorly represented in both the present study as well as the two previous parenting scale studies, suggesting that the parenting scale should be used cautiously with non-white parents; further study of the parenting scale with ethnic minority groups is needed. Furthermore, the cross-sectional design of

this study limits conclusions regarding the direction of causality of the relations between parenting, hyperactivity, and conduct problems; past research and theory suggest that these relations are likely to be bidirectional (Shaw & Bell, 1993). Nonetheless, this study adds to the literature as the first to examine the value of the parenting scale with parents of elementary school-aged children and the first to examine its use with children with ADHD.

References

Achenbach, T. M. (1991). *Manual for the child behavior checklist/4-18 and 1991 Profile.* Burlington, VT: University of Vermont Department of Psychiatry.

American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders.* (4th ed.). Washington, DC: American Psychiatric Association.

Arnold, D. S., O'Leary, S. G., Wolff, L. S., & Acker, M. M. (1993). The Parenting Scale: A measure of dysfunctional parenting in discipline situations. *Psychological Assessment*, *5*, 137–144.

Barkley, R. A. (1990). *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment.* New York: Guilford Press.

Barkley, R. A. (1998). *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment.* (2nd ed.). New York: Guilford Press.

Barkley, R. A., DuPaul, G. J., & McMurray, M. B. (1990). Comprehensive evaluation of attention deficit disorder with and without hyperactivity as defined by research criteria. *Journal of Consulting and Clinical Psychology*, *58*, 775–789.

Barkley, R. A., Fischer, M., Edelbrock, C., & Smallish, L. (1990). The adolescent outcome of hyperactive children diagnosed by research criteria. I. An 8-year prospective follow-up study. *Journal of the American Academy of Child and Adolescent Psychiatry*, *29*, 546–557.

Barkley, R. A., Fischer, M., Edelbrock, C., & Smallish, L. (1991). The adolescent outcome of hyperactive children diagnosed by research criteria. III. Mother-child interactions, family conflicts, and maternal psychopathology. *Journal of Child Psychology and Psychiatry*, *32*, 233–255.

Cattell, R. B., Balcar, K. R., Horn, J. L., & Nesselroade, J. R. (1969). Factor matching procedures: An improvement of the s index; with tables. *Educational and Psychological Measurement*, *29*, 281–792.

Danforth, J. S. (1998). The outcome of parent training using the behavior management flow chart with mothers and their children with oppositional defiant disorder and attention-deficit hyperactivity disorder. *Behavior Modification*, *22*, 443–473.

Danforth, J. S. (1999). The outcome of parent training using the Behavior Management Flow Chart with a mother and her twin boys with Oppositional Defiant Disorder and Attention-Deficit Hyperactivity Disorder: A case study. *Child and Family Behavior Therapy*, 21, 59–80

Danforth, J. S., Barkley, R. A., & Stokes, T. F. (1991). Observations of parent-child interactions with hyperactive children: Research and clinical implications. *Clinical Psychology Review*, *11*, 703–727.

Frick, P. J., Kamphaus, R. W., Lahey, B. B., Loeber, R., Christ, M. G., Hart, E. L., & Tannenbaum, L. E. (1991). Academic underachievement and the disruptive behavior disorders. *Journal of Consulting and Clinical Psychology*, *59*, 289–295.

Gaub, M., & Carlson, C. L. (1997). Behavioral characteristics of DSM-IV ADHD subtypes in a school-based population. *Journal of Abnormal Child Psychology*, *25*, 103–109.

Hinshaw, S. P. (1994). *Attention deficits and hyperactivity in children.* Thousand Oaks, CA: Sage.

Irvine, A. B., Biglan, A., Smolkowski, K., & Ary, D. V. (1999). The value of the Parenting Scale for measuring the discipline practices of parents of middle school children. *Behaviour Research and Therapy*, *37*, 127–142.

Johnston, C. (1996). Parent characteristics and parent-child interactions in families of nonproblem children and ADHD children with higher and lower levels of oppositional-defiant behavior. *Journal of Abnormal Child Psychology*, *24*, 85–104.

Lindahl, K. (1998). Family process variables and children's disruptive behavior problems. *Journal of Family Psychology*, *12*, 420–436.

Loney, J. (1987). Hyperactivity and aggression in the diagnosis of attention deficit disorder. In (pp. 99–135). B. B. Lahey, & A. E. Kazdin, *Advances in clinical child psychology*, *Vol. 10*. New York: Plenum Press.

Mash, E. J., & Terdal, L. G. (1997). Assessment of child and family disturbance: A behavioral-systems approach. In E. J. Mash, & L. G. Terdal, *Assessment of childhood disorders* (3rd ed.) (pp. 3–68). New York: Guilford.

Ostrander, R., Weinfurt, K. P., Yarnold, P. R., & August, G. J. (1998). Diagnosing attention deficit disorders with the Behavioral Assessment System for children and the child Behavior Checklist: Test and construct validity analyses using optimal discriminant classification trees. *Journal of Consulting and Clinical Psychology*, *66*, 660–672.

Pisterman, S., McGrath, P., Firestone, P., Goodman, J. T., Webster, I., & Mallory, R. (1989). Outcome of parent-mediated treatment of preschoolers with Attention Deficit Disorder with Hyperactivity. *Journal of Consulting and Clinical Psychology*, *47*, 628–635.

Reynolds, C. R., & Kamphaus, R. W. (1992). *Behavioral Assessment System for Children manual.* Circle Pines, MN: American Guidance Service.

Schwarz, J. C., Barton-Henry, M. L., & Pruzinsky, T. (1985). Assessing child-rearing behaviors: A comparison of ratings made by mother, father, child, and sibling on the CRPBI. *Child Development*, *56*, 462–479.

Shaffer, D., Fisher, P., Lucas, C. P., Dulcan, M. K., & Schwab-Stone, M. (2000). Diagnostic Interview Schedule for Children Version IV (NIMH DISC–IV): Description, differences from previous versions, and reliability of some common diagnoses. *Journal of the American Academy of Child & Adolescent Psychiatry*, *39*, 28–38.

Shaw, D. S., & Bell, R. Q. (1993). Developmental theories of parental contributors to antisocial behavior. *Journal of Abnormal Child Psychology*, *21*, 493–518.

Stormont-Spurgin, M., & Zentall, S. S. (1995). Contributing factors in the manifestation of aggression in preschoolers with hyperactivity. *Journal of Child Psychology and Psychiatry*, *36*, 491–509.

Szatmari, P., Boyle, M., & Offord, D. R. (1989). ADDH and conduct disorder: degree of diagnostic overlap and differences among correlates. *Journal of the American Academy of Child and Adolescent Psychiatry*, *28*, 865–873.

Whalen, C. K., & Henker, B. (1998). Attention-deficit/Hyperactivity Disorders. In T. H. Ollendick, & M. Hersen, *Handbook of child psychopathology* (3rd ed.) (pp. 181–211). New York: Plenum Press.