

## The Structure of Child and Adolescent Psychopathology: Generating New Hypotheses

Benjamin B. Lahey  
University of Chicago

Brooks Applegate  
Western Michigan University

Irwin D. Waldman  
Emory University

John D. Loft  
Research Triangle Institute

Benjamin L. Hankin  
University of Illinois at Chicago

Jacqueline Rick  
Columbia University

To begin to resolve conflicts among current competing taxonomies of child and adolescent psychopathology, the authors developed an interview covering the symptoms of anxiety, depression, inattention, and disruptive behavior used in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 1994), the *International Statistical Classification of Diseases and Related Health Problems (ICD-10)* (World Health Organization, 1992), and several implicit taxonomies. This interview will be used in the future to compare the internal and external validity of alternative taxonomies. To provide an informative framework for future hypothesis-testing studies, the authors used principal factor analysis to induce new testable hypotheses regarding the structure of this item pool in a representative sample of 1,358 children and adolescents ranging in age from 4 to 17 years. The resulting hypotheses differed from the *DSM-IV*, particularly in suggesting that some anxiety symptoms are part of the same syndrome as depression, whereas separation anxiety, fears, and compulsions constitute a separate anxiety dimension.

There has long been agreement that child and adolescent psychopathology is not unitary (Achenbach, 1985; Quay, 1986).<sup>1</sup> Consequently, researchers have often used empirical methods in an attempt to define multiple dimensions or types of child and adolescent psychopathology. Despite these efforts, however, there are

still marked disagreements regarding even the most basic issues in the taxonomy of child and adolescent psychopathology.

Currently, the field is dominated by two general approaches to taxonomy: (a) the formal diagnostic systems of the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 1994) and the *International Statistical Classification of Diseases and Related Health Problems (ICD-10)* (World Health Organization, 1992); and (b) the implicit taxonomies of psychopathology underlying rating scales, such as the Child Behavior Checklist (CBCL; Achenbach, 1991a), the Revised Conners Parent Rating Scale (CPRS-R; Conners, Sitarénos, Parker, & Epstein, 1998), and the Revised Behavior Problem Checklist (RBPC; Quay & Peterson, 1982). On the surface, rating scales and diagnostic systems may appear to have little in common. Like the *DSM-IV* and the *ICD-10*, however, each rating scale divides symptoms into groups that are hypothesized to be distinct from other groups of symptoms. It is important that rating scales measure psychopathology continuously and diagnostic systems use dichotomous categorization, but the distinction between

---

Benjamin B. Lahey, Department of Psychiatry, University of Chicago; Brooks Applegate, Department of Educational Studies, Western Michigan University; Irwin D. Waldman, Department of Psychology, Emory University; John D. Loft, Research Triangle Institute, Research Triangle Park, North Carolina; Benjamin L. Hankin, Department of Psychology, University of Illinois at Chicago; Jacqueline Rick, Department of Psychology, Columbia University.

This study was supported by National Institute of Mental Health Grants U01 MH54281 and R01 MH59111 to Benjamin B. Lahey and K01-MH01818 to Irwin D. Waldman. We appreciate the helpful comments of Kate Keenan, Herbert Quay, and Erik Willcutt on earlier versions of this article, and we thank Rick Hoyle, Brian O'Connor, and Paul Rathouz for their generous statistical consultation. Many stimulating conversations over the years with Caryn Carlson, Paul Frick, and Keith McBurnett also contributed materially to this work. In addition, we gratefully acknowledge the unusually cogent and helpful criticisms and suggestions of the action editor and the challenging and sophisticated comments of the anonymous reviewers. We accept responsibility for not always following their good advice.

Correspondence concerning this article should be addressed to Benjamin B. Lahey, Department of Psychiatry (MC 3077), University of Chicago, 5811 South Maryland Avenue, Chicago, IL 60637. E-mail: blahey@yoda.bsd.uchicago.edu

---

<sup>1</sup> In this article, we use the terms *psychopathology* and *symptom* to refer to behaviors or emotions that are maladaptive under some or all circumstances because they cause distress or impair the individual's adaptive functioning. These terms imply neither an acceptance nor a rejection of medical models of maladaptive behavior. We use the term *taxonomy* in its generic sense of scientific classification by grouping, in this case the grouping of symptoms. We do not restrict the term taxonomy as some writers have to systems of classification that use nominal categories rather than continuous measurement.

continuous and dichotomous measurement is not as profound as it may first appear. Indeed, it has been argued that most *DSM-IV* and *ICD-10* diagnoses for youth can be viewed as dichotomizations of underlying continuous dimensions of psychopathology into categories of presumed “normality” and “disorder” (Boyle et al., 1996; Lahey, Applegate, Barkley, et al., 1994; Lahey, Applegate, McBurnett, et al., 1994; Waldman, Lilenfeld, & Lahey, 1995).

Current research on child and adolescent psychopathology is impeded by the fact that different researchers use different taxonomies in their studies. This creates a scientific “Tower of Babel,” in which findings based on one taxonomic system cannot be integrated with results based on other systems. In addition, it is likely that some taxonomies are more valid than others. Therefore, the empirical resolution of key differences among the competing explicit and implicit taxonomies would be of great importance. Recent improvements in methods for the study of both environmental and genetic risk factors have set the stage for rapid increases in knowledge in coming years, but such advances require a valid taxonomy of psychopathology. To use the example of molecular genetics, one cannot accurately relate phenotypes to genotypes until the phenotypes of psychopathology have been validly characterized.

Fortunately, the distinctions among the various implicit and explicit taxonomic systems boil down to three kinds of specific differences in hypotheses about the dimensions of psychopathology that can be resolved using appropriate empirical methods: (a) “lumping” versus “splitting,” (b) assignment of symptoms to dimensions, and (c) differences in hypothesized dimensions.

### “Lumping” Versus “Splitting”

In some cases, a group of symptoms comprises a single dimension in one taxonomic system, but they are split into two or more dimensions in another system. If two putative dimensions of psychopathology have at least some distinct features, splitting them into separate dimensions would be essential. Unknowingly lumping taxonomic “apples and oranges” with different causes, developmental courses, responses to treatment, and other important correlates will give us a science based on disinformation (Cantwell & Baker, 1988; Moffitt, 1993). There are four major points of difference among current taxonomies that can be viewed as questions of lumping versus splitting.

1. Should separate dimensions of inattention and hyperactivity-impulsivity (HI) be distinguished?
2. Should aggressive and nonaggressive conduct problems be distinguished?
3. Should anxiety and depression be distinguished?
4. Should multiple dimensions of anxiety be distinguished?

Consistent with the *ICD-10* definition of hyperkinesis, exploratory factor analyses (EFA) of parent and teacher ratings of the CBCL item pool suggest that symptoms of inattention, hyperactivity, and impulsivity constitute a single dimension (Achenbach, 1978; Achenbach, Conners, Quay, Verhulst, & Howell, 1989; Achenbach & Edelbrock, 1979). In contrast, when Quay (1986) and Lahey, Carlson, and Frick (1997) reviewed the literature on EFA of parent and teacher ratings, they concluded that the data

were more consistent with the *DSM-IV* hypothesis of separate dimensions of inattention and HI. Since those reviews, confirmatory factor analysis (CFA) has often been used to compare the fit of the one-factor *ICD-10*/CBCL model to the two-factor *DSM-IV* model (Beiser, Dion, & Gotowiec, 2000; Burns, Boe, Walsh, Sommers-Flannagan, & Teegarden, 2001; Burns, Walsh, Owen, & Snell, 1997; Burns, Walsh, Patterson, et al., 1997; Collett, Crowley, Gimpel, & Greenson, 2000; DuPaul et al., 1998; Gomez, Harvey, Quick, Scharer, & Harris, 1999; Molina, Smith, & Pelham, 2001; Pillow, Pelham, Hoza, Molina, & Stultz, 1998). In these studies, the *DSM-IV* model has consistently been found to fit better than the one-factor model of attention-deficit/hyperactivity disorder (ADHD), but this issue has not been fully resolved.

The key taxonomic questions regarding anxiety and depression also involve lumping versus splitting. Much has been written about whether anxiety and depression are distinct enough in children and adolescents to be considered separate disorders (e.g., Brady & Kendall, 1992; Compas & Oppedisano, 2000). Several published EFAs and one latent class analysis of parent ratings have suggested a single dimension of anxiety and depression symptoms (Achenbach, 1991a; Achenbach et al., 1989; Quay, 1986; Quay & Peterson, 1982; Wadsworth, Hudziak, Heath, & Achenbach, 2001). Some EFAs of youth self-ratings have also yielded a single dimension of anxiety and depression (Achenbach, 1991b). None of these studies used item pools that included the full range of symptoms of anxiety and depression used in *DSM-IV* and *ICD-10*, however.

Cole, Truglio, and Peeke (1997) provided evidence that the factor structure of anxiety and depression symptoms may change with age. Among third-grade children, factor analyses of parent, youth, and teacher reports supported a single dimension of anxiety and depression symptoms, but separate anxiety and depression dimensions emerged when the children had reached the sixth grade. In a mixed sample of 216 child and adolescent outpatients of an anxiety clinic, Chorpita, Albano, and Barlow (1998) created three lists of items selected from standardized parent and child self-report measures, which they labeled fears, anxiety, and depression. Chorpita et al. used CFA, a model consisting of the three dimensions of fears, anxiety, and depression, to fit the data better than several one- and two-factor models among both children and adolescents. The item pools used in the Cole et al. and Chorpita et al. studies did not cover the full breadth of symptoms used in *DSM-IV* and *ICD-10* and the sample sizes were modest, but these studies suggest that anxiety and depression may not be unitary, especially during adolescence.

A number of studies of child-reported anxiety symptoms have identified multiple dimensions of anxiety using EFA (Birmaher et al., 1997; M. A. Campbell & Rapee, 1994; March, Parker, Sullivan, Stallings, & Conners, 1997; Ollendick, 1983; Statin, Magnusson, Olah, Kassin, & Reddy, 1991) and CFA (Spence, 1997). Each study identified a different set of dimensions, probably resulting from differences in their item pools. In all of these studies, however, anxiety regarding (a) social rejection and (b) fear of harm and separation from caretakers emerged as separate dimensions.

Collectively, these studies suggest that it may be justifiable to distinguish some aspects of anxiety from depression, particularly in the self-reports of adolescents. In addition, it may be valid to at least distinguish social anxiety from fears and separation anxiety in youth. A number of studies of large population-based samples of adults further clarify this hypothesis. In two studies (Krueger,

1999; Vollebergh et al., 2001), CFAs of dichotomous diagnoses of anxiety disorders, major depression, dysthymia, antisocial behavior, and substance abuse indicated that a model specifying the three factors of (a) depression, dysthymia, and generalized anxiety disorder; (b) specific phobia, social phobia, agoraphobia, and panic disorder; and (c) antisocial and substance abuse disorders fit the data better than alternative models. In a third study, multivariate genetic analyses of 5,600 adult twin pairs suggested that the genetic structure of seven diagnoses was best explained by three factors: (a) depression and generalized anxiety disorder, (b) situational and animal phobias, and (c) externalizing disorders (Kendler, Prescott, Myers, & Neale, 2003). Furthermore, a number of population-based studies of adults indicate that depression is strongly associated with generalized anxiety and, to a considerable extent, social anxiety (Kendler, Neale, Kessler, Heath, & Eaves, 1992; Kessler, Stang, Wittchen, Stein, & Walters, 1999; Merikangas & Angst, 1995). Considered together, these studies suggest that depression is at least distinct from fears, but may not be distinct from generalized anxiety and perhaps social anxiety.

### Which Symptoms Are Part of Which Dimensions?

The various taxonomies in use today also differ in their assignment of symptoms to dimensions. For example, oppositional behaviors and aggressive conduct problems are considered to constitute a single dimension in the CBCL and RBPC, whereas nonaggressive conduct problems are part of a separate dimension. In contrast, aggressive and nonaggressive conduct problems constitute a single dimension in the *DSM-IV*, whereas oppositional behaviors are viewed as constituting a separate dimension in *DSM-IV*. Reviews of the EFA literature have inconsistently concluded that oppositional and aggressive behaviors should (Frick et al., 1993; Lahey, Loeber, Quay, Frick, & Grimm, 1992; Loeber, Lahey, & Thomas, 1991) and should not (Quay, 1986) be considered separate dimensions. A CFA of data from a large population-based sample of youth, however, found that models that distinguished oppositional from aggressive conduct disorder (CD) behaviors fit the data better than models in which oppositional and aggressive CD behaviors were combined (Burns, Walsh, Patterson, et al., 1997). Similarly, Fergusson et al. (1994) found that a model distinguishing oppositional behavior, aggressive CD, and nonaggressive CD fit the data better than a one-factor model in which these symptoms were lumped together. Unfortunately, models based on the CBCL or *DSM-IV* were not compared with the other models by Fergusson. Thus, it is not currently clear whether aggressive CD behaviors should be considered to be (a) part of the same dimension as oppositional behavior, (b) part of the same dimension as nonaggressive CD, or (c) distinct from both oppositional behavior and nonaggressive CD.

Rutter (1997) raised a different issue related to the assignment of symptoms to dimensions. He discussed the implications of defining two or more syndromes partly on the basis of the same symptom. For example, the fact that irritability is considered to be a symptom of oppositional defiant disorder (ODD), major depression, mania, and generalized anxiety disorder in *DSM-IV* increases the likelihood of artifactual comorbidity among these diagnoses. Therefore, it will be particularly important to study the diagnostic utility of symptoms that are used to define multiple disorders in *DSM-IV*.

### Differences in Hypothesized Dimensions of Psychopathology

Some taxonomies identify novel dimensions of psychopathology. For example, the CBCL includes a dimension of somatic complaints that has no counterpart in *DSM-IV* or *ICD-10*. In addition, it has been proposed that it might be possible to use a separate dimension of "sluggish cognitive tempo" symptoms to refine the definition of the predominantly inattentive subtype of ADHD (Carlson & Mann, 2002; McBurnett, Piffner, & Frick, 2001). If important dimensions of psychopathology are ignored by some taxonomic systems, doing so would limit the comprehensiveness of the taxonomy.

### Overview of a Program of Research

Although no single line of research can unite the field around a common taxonomy of child and adolescent psychopathology, we have begun a series of studies with the intention of contributing to the resolution of the taxonomic controversies just reviewed. Our first goal is to create an instrument that will allow fair comparative tests of competing hypotheses regarding the structure of child and adolescent psychopathology. This instrument contains items describing all symptoms of the more prevalent forms of child and adolescent psychopathology defined in the *DSM-IV* and the *ICD-10*. This task was facilitated by the decision of the *DSM-IV* and the *ICD-10* Task Forces to adopt a common set of symptoms, even though many disorders are defined differently. In addition, the new instrument contains nonoverlapping items that refer to emotions and behaviors that are included in widely used rating scales and in two "minitaxonomies" of aggression which propose distinctions between "reactive" and "proactive" aggression (Dodge & Coie, 1987) and suggest that "relational aggression" items may be particularly important for characterizing aggression in girls (Crick & Grotpeter, 1995). Items also were included that address law-violating behaviors that are assessed in delinquency research, but that are not part of definitions of CD, as well as a number of sluggish cognitive tempo symptoms that may better characterize the predominantly inattentive type of ADHD (Lahey, Stempniak, Robinson, & Tyroler, 1978; McBurnett et al., 2001).

Because one cannot predict how the items in this broad new item pool will factor together, we begin our program of research with EFA in this first study. Although EFA is limited in important ways, it has played an influential role in developing existing taxonomic hypotheses underlying rating scales (e.g., Achenbach, 1978; Conners, 1969; Quay & Peterson, 1982). In addition, the taxonomy of the *DSM-IV* disruptive behavior disorders was based partly on EFA (Lahey, Carlson, & Frick, 1997; Lahey, Loeber, Quay, Frick, & Grimm, 1997). Previous EFA studies used item pools that were quite different from the present item pool, however. Because the characteristics of the item pool can substantially influence the results of EFA, it is not known if any existing taxonomic hypothesis is consistent with the correlational structure of the new item pool. Thus, to avoid putting the hypothesis-testing cart before the hypothesis-generating horse, it is necessary to first use EFA to induce taxonomic hypotheses specifically on the basis of the new item pool. If the resulting hypotheses differ from existing taxonomic hypotheses, they should be compared with the existing hypotheses in future studies using CFA and external validation methods.

The present sample was selected to be large enough to allow an appropriate ratio of participants to items, to include both girls and boys, to be sociodemographically diverse, and to minimize selection biases that might render the factor structure unrepresentative of the general population (Goodman et al., 1997). It is particularly important not to restrict the study of dimensions of psychopathology only to clinical samples, in which greater comorbidity than is reflected in the general population could make distinctions among putative dimensions more difficult to detect (Goodman et al., 1997). It is important to note, however, that Hinshaw (1987) concluded that findings from studies of the factor structure of symptoms of inattention, HI, and conduct problems did not differ in community versus clinical samples.

## Method

### Participants

The sample for the Georgia Health and Behavior Study (GHBS) was selected to be representative of the approximately 900,000 children and adolescents living in the 20 diverse urban, suburban, and rural counties that comprise the Atlanta Metropolitan Statistical Area (MSA) at the time of the 2000 U.S. census. The sample was selected in two cohorts. In Cohort 1, a sample of 3,449 addresses in the Atlanta MSA was selected from a frame of residential mailing addresses in the Atlanta MSA. The addresses were purchased from a vendor qualified to access all mailing addresses serviced by the U.S. Postal Service. The vendor had prescreened the frame to eliminate nonresidential addresses and had matched mailing addresses with data from birth registries, vital records, and other databases to increase the proportion of households with children in the frame. To assure that the GHBS sample was selected from across all socioeconomic strata, the frame included households with and without telephones. To ensure a proportional distribution across counties, a stratified simple random sample of households was selected within counties, with the number drawn from each county being proportional to the number of households believed to include children or adolescents within each county.

Following receipt of an advance letter, sampled households were screened in person for the presence of eligible children. Children and adolescents were eligible for participation if (a) they were 4–17 years of age on the date of screening, (b) had coresided with the consenting adult caretaker for at least 6 of the past 12 months, and (c) both the youth and the adult caretaker spoke English. A total of 22 contacted families in the Atlanta MSA were classified as ineligible because of the absence of an English-speaking adult caretaker in the household, indicating little opportunity for sample bias as a result of language. In families with several eligible youth, one child was randomly selected. Parents and guardians who agreed to participate in the study gave written informed consent, and youth who were old enough to be interviewed ( $\geq 9$  years of age) gave oral assent to participate. All interviews of adult caretakers and youth were conducted in person in the family's home. Adult caretakers were paid \$20 and youth were paid \$10 for participation.

Interviews of Cohort 1 began in January of 2000. By January of 2001, the projected overall response rate was below the target of 70%. Nonresponse was due both to households that had not yet agreed to be screened (608 of 3,449 households) and households who were screened and found to be eligible but declined to be interviewed (343 of 1,644 screened eligible households). To minimize possible nonresponse bias, a subsample of 100 nonrespondent households in Cohort 1 was selected for additional recruiting efforts. That is, rather than continuing to recontact all nonrespondents, we used a strategy described by Cochran (1977) to target refusal conversion more efficiently. A subsample of 100 households was randomly selected from those that had refused either to be screened or, if eligible, refused the interview. Following these phases of data collection (initial

recruitment and nonresponse follow-up), the number of interviewed families was 1,266. The effective response rate for Cohort 1 was calculated as the sum of the response rate for the initial recruitment ( $R_1$ ) plus the response rate in the follow-up sample ( $R_2$ ) weighted by the proportion of nonrespondents in the initial sample ( $1-R_1$ ), using the formula:  $R = R_1 + (1-R_1)R_2$ .  $R_1$  was calculated following the American Association for Public Opinion Research (2000) guidelines:  $R_1 = C / (E + e[U])$ , where  $C$  = Completed interviews of eligible adult caretakers,  $E$  = Eligible adult caretakers identified in screening,  $U$  = Unscreened households, and  $e$  = Estimate of eligibility rate among unscreened households.

The actual eligibility rate among screened households in Cohort 1 (61.4%) was used to estimate  $e$ .  $R_2$ , and the response rate for the nonresponse follow-up sample was calculated in the same way. The effective response rate for Cohort 1 was 70.5% for all age groups and 75.9% for 9–17-year-old youth.

In March of 2001, recruitment and data collection on a second cohort was initiated to increase the sample size. Nine hundred additional addresses were selected, but because of the smaller size of Cohort 2, they were not prescreened for the likely presence of children or adolescents in the household. The stratified simple random sample for Cohort 2 was selected both within counties and postal zip codes to ensure a representative distribution across the MSA. Of this sample of 900 households, 775 cases were screened in person to yield 153 eligible households. No households were selected for both cohorts. Among these eligible households, interviews of adult caretakers were completed for 120 children. The response rate for Cohort 2 was 74.1% for interviews of adult caretakers and 70.6% for interviews of 9–17-year-old youth.

Combining the two cohorts, data were collected from 1,382 adult caretakers and 845 9–17-year-old youth. Of the 890 completed adult caretaker interviews for 9–17 year olds, there was not a corresponding completed youth interview in 51 cases. Of the 845 directly interviewed 9–17-year-old youth, 6 had no corresponding interview of an adult caretaker.

After the completion of interviews, 24 of the adult caretaker interviews of 4–17 year olds were excluded from analyses because the adult caretaker reported that the youth had been diagnosed by a professional with mental retardation, psychosis, and/or an autism-spectrum disorder. Similarly, 13 of the completed youth interviews of 9–17 year olds were excluded for the same reason. As a result, 1,358 adult caretaker interviews (4–17 year olds) and 832 youth interviews (9–17 year olds) in the GHBS sample were used in the analyses. Demographic information on the participants is presented in Table 1.

During data collection for Cohort 1, a subset of participants was selected for participation in a second administration of the new instrument to assess its test-retest reliability 7–14 days following the initial interview. All youth with mean caretaker ratings of all psychopathology items in the top 7.5% of the sample (stratified by three age groups) and an equal number drawn randomly from the remainder of the sample were selected to ensure a full distribution of psychopathology scores. Because the threshold for defining high psychopathology scores depended on the sample available at that time, the threshold was adjusted as data were collected to improve the accuracy of the threshold. Initially, all youth with  $> 8\%$  of psychopathology items rated by adult caretakers as *pretty much* or *very much* on a Likert-type scale were asked to participate (and an equal number randomly drawn from the sample below this level). This threshold underestimated the proportion of mean psychopathology ratings that fell in the top 7.5% of the sample and was adjusted to  $> 10\%$  with items ratings of *pretty much* or *very much* in February of 2000 and adjusted again in March to different thresholds for three age groups: 4–8 years ( $> 17\%$ ), 9–12 years ( $> 15\%$ ), and 13–17 years ( $> 14\%$ ). This threshold was used throughout the remainder of Phase 1 of data collection. A total of 290 of 348 selected adult caretakers (83.3%) completed the retest interviews. Among 9–17-year-old youth, 234 were selected for retest interviews and 196 completed the retest interviews (83.8%).

Table 1  
Age, Gender, Race/Ethnic Group Identification, and Socioeconomic Characteristics of Youth Participants With Completed Adult Caretaker Interviews and Completed Youth Interviews

Demographic characteristic	No. completed interviews	
	Adult	Youth <sup>a</sup>
Age		
4	92	
5	103	
6	106	
7	100	
8	82	
9	96	85
10	98	90
11	95	94
12	101	96
13	89	82
14	96	96
15	114	108
16	85	85
17	101	96
Sex		
Female	695	434
Male	663	398
Race/ethnicity		
White	926	561
African American	327	209
Hispanic	39	23
Other groups	64	31
Not reported	2	8
Total family income (\$1,000s)		
<i>M</i>	78.4	77.8
<i>SD</i>	46.5	46.7
Maternal education: (highest grade)		
<i>M</i>	12.7	12.0
<i>SD</i>	1.3	2.8
Paternal education (highest grade)		
<i>M</i>	12.6	11.8
<i>SD</i>	1.5	3.2
Cohabiting biological parents		
%	74.7	71.9

*Note.* Three youth who were eliminated from exploratory factor analyses of youth self-ratings are included in this table. After exclusions for mental retardation, psychosis, and/or autism spectrum disorders, completed adult caretaker interview  $N = 1,358$  and completed youth interview  $N = 832$ .

<sup>a</sup> Children below the age of 9 years were not eligible for direct interviews.

## Measures

The new structured interview developed for the present series of studies was termed the investigational version of the Child and Adolescent Psychopathology Scale (CAPS). The CAPS item pool covers all *DSM-IV* symptoms of ADHD, ODD, CD, major depression and dysthymia, separation anxiety disorder, generalized anxiety disorder, agoraphobia, social phobia, specific phobia, and obsessive-compulsive disorder (OCD) in the *DSM-IV* and the *ICD-10*. In addition, the CAPS contained 4 of 14 symptoms of panic disorder (*had a sudden attack when he or she felt afraid or strange. . .when he or she had not seen or heard something that scared him or her; heart suddenly started to beat fast for no good reason; suddenly felt that he or she was suffocating or couldn't breathe. . .when he or she wasn't choking on something; and felt dizzy*). Preliminary EFAs showed that these panic disorder items did not load on any single factor for either respondent and usually did not load on any factor. We assume that this is

because panic disorder is rare until late adolescence, the coverage of panic disorder symptoms was incomplete, and because these items may be difficult for respondents to rate meaningfully. On the basis of these considerations, the four panic disorder symptoms were dropped from the CAPS item pool.

The CAPS is not composed of items taken verbatim from any current instrument, but uses newly written items in a common format that refer to essentially the same emotions and behaviors. With the caveat that the new items may not be perceived by informants in exactly the same way as the corresponding items in other instruments, the new instrument provides the first opportunity to study the structure of this more comprehensive set of items. Abbreviated versions of the CAPS items are presented in the factor loading tables. CAPS items covering *DSM-IV* symptoms were based on the wording of the "stem questions" in Version IV of the Diagnostic Interview Schedule for Children (DISC; Shaffer et al., 1996), modified from *yes* or *no* questions to fit a different response scale. Respondents were shown a four-point response scale for rating CAPS items in which 1 = *not at all*, 2 = *just a little*, 3 = *pretty much*, and 4 = *very much*. They were asked to rate each item by thinking about how well the item described the youth's emotion or behavior, how often it occurred, and how serious it was during the past 12 months. The CAPS items that address depression symptoms referred to changes in usual functioning during the last 12 months. The ratings were converted to 0–3 before analyses.

In addition, new items were written in the same format to describe relevant emotions and behaviors that are referenced in widely used rating scales, but are not used in the *DSM-IV* or the *ICD-10* (Achenbach, 1991a; Conners et al., 1998; Loney, 1987; Quay & Peterson, 1982). New items were also developed on the basis of the widely used Self-Reported Delinquency Interview (SRD; Elliott, Huizinga, & Ageton, 1985) and new items were written to describe the behaviors referred to as reactive, proactive, and relational aggression (Crick & Grotpeter, 1995; Dodge & Coie, 1987).

CAPS items were randomized within the instrument and presented in counterbalanced order, with a randomly selected half of the participants being administered the items in forward order and half in reverse order to control for any potential order effects. The order of administration of items was the same for both the informants when both were interviewed. If the youth had taken medication to help his or her emotions, behavior, attention, or hyperactivity during the past 12 months (9.2% of the sample), the respondent was asked to rate the youth when he or she had not been taking medication during the past 12 months. It is not known how accurately respondents were able to do this, however.

The CAPS follows the DISC strategy of asking more than one question to address some *DSM-IV* symptoms. Many *DSM-IV* symptoms are defined in terms of two behaviors (e.g., *spiteful or vindictive* or *headaches or stomachaches when separated from attachment figure*). Because items that refer to two behaviors are difficult to rate, two separate items were written to address these symptoms. In other cases, the authors of the DISC felt that symptoms that did not explicitly refer to multiple behaviors could be addressed best by using two or more items that referred to multiple manifestations of that symptom. We adopted this strategy both based on its logic and because the version of the DISC used in the *DSM-IV* field trials (Frick et al., 1994; Lahey, Applegate, Barkley, et al., 1994; Lahey, Applegate, McBurnett, et al., 1994) used this strategy in selecting the symptoms and diagnostic thresholds for several *DSM-IV* disorders. In other cases, items that were considered to be nearly synonymous were combined to avoid factors that were based solely on lexical similarity. As shown in the Appendix, 55 CAPS items were combined into 23 composite items by taking the highest rating among the multiple items before data analysis began.

In other cases, however, items traditionally thought to represent the same construct were kept separate to determine whether they factored together. For example, increased and decreased sleep, increased and decreased appetite, and two types of lying were kept separate. The *DSM-IV* depression symptom of cognitive impairment was limited to difficulty thinking or deciding because other items tapped difficulties in concentration. This was

done to avoid artifactual correlations between this item and items reflecting inattention.

Some items were not included in the caretaker CAPS interview for children < 9 years old on the grounds that they were age-inappropriate and would almost always have been rated *not at all* if included, except in highly selected samples. These items were the following: *forced others to engage in sexual activities, went joyriding in vehicles taken without permission, snatched purses or jewelry, engaged in prostitution, and sold marijuana or drugs*. These items were scored as zero for all children < 9 years of age. They were so rarely endorsed even for older youth, however, that they could not be included in the present analyses.

Interviewers read each CAPS item aloud to the respondent from a laptop computer and entered responses using the computer. The program routed the interview from question to question, skipped age-inappropriate questions, used correct sex terms to refer to girls and boys, referred to "other children" or "other people your age" for youth < 11 years or  $\geq 11$  years in some items, used the correct wording for children who did or did not attend school or work, and disallowed out-of-range responses.

*Informants on psychopathology.* Four types of adult caretakers were eligible to complete the caretaker CAPS interviews, with the great majority of interviews being conducted with mothers (82.3% biological mothers, 14.3% biological fathers, 1.0% step-mothers, and 2.4% grandmothers). Because reports of symptoms from adult caretakers and youth are only modestly correlated, Achenbach, McConaughy, and Howell (1987) argued that information should be obtained from multiple informants because each source provides complementary information. A variety of studies suggest that the use of multiple informants improves the validity of assessments of some mental disorders in children, but the optimal informants are different (a) at different ages and (b) for different types of symptoms. Children < 9 years have been found to be unreliable informants on all types of symptoms in structured interviews, but older children and adolescents can report reliable and valid information on some kinds of symptoms (Edelbrock, Costello, Dulcan, Kalas, & Conover, 1985; Jensen et al., 1999; Schwab-Stone, Fallon, Briggs, & Crowther, 1994). For this reason, only adult reports of symptoms are typically used in studies of children < 9 years, whereas multiple informants are used for some disorders in older youth (Lahey, Applegate, Barkley, et al., 1994; Lahey, Applegate, McBurnett, et al., 1994). This strategy makes good developmental sense, as parents of younger children have greater knowledge of their children's behaviors and emotions because of (a) more frequent contact and (b) their children's greater openness. Although older children and adolescents spend more time away from adult caretakers, older children and adolescents can provide reliable and valid reports on symptoms about which adult caretakers may have incomplete knowledge.

Youth over the age of 8 years have consistently been shown to be useful informants for anxiety, depression, and conduct disorder (CD), but not ODD and ADHD (Bird, Gould, & Staghezza, 1992; Hart, Lahey, Loeber, & Hanson, 1994; Loeber, Green, Lahey, & Stouthamer-Loeber, 1989). Youth may be unable to contribute valid information on ADHD and ODD because these symptoms require judgments about broad aspects of behavior relative to other youth, but they are able to provide useful reports on the more specific behaviors and emotions that reflect anxiety, depression, and CD. Consistent with this view, virtually the entire research literature on ADHD and ODD in youth uses only adult reports of symptoms, whereas both adults and youth are commonly used as informants in research on anxiety, depression, and CD (Lahey, Miller, Gordon, & Riley, 1999). Thus, we used adult caretakers as respondents for all types of symptoms at all ages and used youth reports for symptoms of anxiety, depression, and conduct problems for 9–17 year olds in separate analyses. Adult caretakers and 9–17-year-old youth were interviewed separately in private settings, usually consecutively by the same trained lay interviewer.

*Measures of functional impairment and distress.* Caretakers and youth reported on indicators of functional impairment, personal distress, and adaptive functioning to estimate the extent to which the hypothesized dimensions of psychopathology were associated with interference with the

youth's functioning. Except for police contacts, which were assessed over the youth's lifetime, these questions referred to the past 12 months. Each measure of impairment and distress was treated as dichotomous to allow use of the metric of odds ratios. The dichotomous measures of functional impairment reported by the caretakers (and their prevalence in the sample for 4–17 year olds) were the following:  $\geq 1$  lifetime police contact (2.9%);  $\geq 1$  suspensions or expulsions from school (5.1%); and  $\geq 1$  unintentional physical injury worse than a scratch, bump, or bruise attributed to the youth's not being careful (5.8%). Continuous measures were dichotomized to capture as closely as possible the most impaired 5% of the sample on the following: an index of global interpersonal impairment based on the mean of ratings on 4-point scales of caretakers being annoyed with the youth, peers being annoyed with the youth, and teachers/bosses being annoyed with the youth (6.3%); a rating of *very much* for having problems completing schoolwork or homework quickly and accurately (9.6%); a rating of *unhappy* or *very unhappy* on a rating of the lowest level of happiness and contentment during the past 12 months (4.2%); and a rating of *hardly ever* or *never* for how often the youth had a close friend (5.0%).

The measures of impairment reported by the 9–17-year-old youth and their prevalences were unintentional physical injury worse than a scratch, bump, or bruise attributed to the youth's not being careful (12.3%); a score in the top 5% of the sample on an index of global interpersonal impairment (mean of ratings on 4-point scales of caretakers being annoyed with the youth, peers being annoyed with the youth, and teachers/bosses being annoyed with the youth); a rating of *very much* for having problems completing schoolwork or homework quickly and accurately (4.9%); a rating as *unhappy* or *very unhappy* for the lowest level of happiness and contentment during the past 12 months (4.3%); and a rating of *hardly ever* or *never* for how often the youth had a close friend (2.6%).

*Measures of adaptive functioning.* In addition, the caretaker and youth provided information on several indicators of adaptive functioning to determine if they were inversely associated with the hypothesized dimensions of psychopathology. Unlike the indicators of functional impairment, these measures reflect common social activities that are typically viewed as adaptive, but are not necessary for the adaptive development of all youth. The caretaker reported whether the 4–17-year-old youth had been away from home for at least several days in a row, like staying with friends or relatives or going to camp (58.6%); if the youth had been a member of a club, team, or other organization, not counting street gangs (77.8%); and if the youth had worked for pay outside the home, which was asked only about youth > 15 years of age because of the low frequency of employment before that age (67.3% for 15–17 year olds). The 9–17-year-old youth similarly reported if he or she had been away from home for at least several days in a row, like staying with friends or relatives or going to camp (68.7%); if he or she had been a member of a club, team, or other organization, not counting street gangs (89.1%); and if he or she had worked for pay outside the home (70.2% for 15–17 year olds).

## Data Analysis

For each informant, EFAs of CAPS item ratings were conducted using principal factor analysis of the product-moment correlation matrix, defining the communalities as the squared-multiple correlation. Both orthogonal varimax rotation and oblique promax rotations were performed, with very similar results in each case. Findings from only the varimax rotations are presented (a) to avoid the need to present and interpret both the factor structure (correlations of items with factors) and the reference structure (semipartial correlations of items with factors, controlling for associations with other correlated factors) when promax rotations are used; and (b) because the interpretation of factor loadings derived from varimax is more familiar to most readers. In addition, we conducted the principal factor analyses using Spearman rank correlations as the measure of association with virtually identical results. We also repeated the EFAs using maximum-likelihood factor analysis. In all cases, these analyses yielded findings that were very similar to those for principal factor analysis in nearly all cases. The few exceptions are noted when presenting the results.

*EFA of caretaker ratings.* After creating the composite items listed in the Appendix and eliminating the 4 panic items, there was a total of 157 items in the adult caretaker version of the CAPS, but 20 items with < 3.0% ratings above 0 (*not at all*) were eliminated from the item pool because of insufficient variation in their scores (listed at the bottom of the Appendix), leaving 137 items.

Respondents were given the option of refusing to answer any specific question. When this occurred, the item was scored as missing for both respondents. In addition, respondents could respond with *don't know*. On the basis of the convention used in scoring the DISC, when an adult caretaker responded with *don't know* to a psychopathology item pertaining to the youth, this response was treated as meaning *not as far as I know* and was scored as zero. In the EFAs of caretaker ratings, 7 of 1,358 youth were eliminated as a result of casewise deletion of cases with missing data on any item.

*EFA of youth self-ratings.* Because of concern about the validity of child and adolescent self-reports of ADHD and ODD symptoms, items referring to these symptoms were not included in the EFA of youth reports. Items that loaded  $\geq .40$  on either the inattention or the hyperactivity-impulsivity/oppositional defiant disorder (HI/ODD) factors in the six-factor solution for the caretaker ratings (as shown later in Table 3) were deleted from the item pool prior to conducting EFAs of youth self-reports. To ensure full coverage of depression symptoms in the EFAs of youth reports, however, the *DSM-IV* depression symptoms of *difficulty thinking or deciding* and *grouchy or irritable* were retained for these EFAs, even though they loaded  $\geq .40$  on factor reflecting inattention, HI, or oppositional behavior in the EFA of caretaker ratings.

After creating the composite items listed in the Appendix, and eliminating the ADHD, ODD, and panic items, there was a total of 112 items in the youth version of the CAPS, but 9 items with < 3.0% ratings above 0 (*not at all*) were eliminated from the item pool as a result of insufficient variation in their scores (see Appendix), leaving 103 items. In subsequent studies, we will consider the diagnostic utility of all items eliminated from the EFAs of caretaker and youth ratings, most of which are low-prevalence but serious antisocial behaviors, using symptom utility statistics (Frick et al., 1994) and extension analysis (Gorsuch, 1997).

For youth self-ratings, both refusals to rate an item and responses of *don't know* were coded as missing. Prior to conducting the EFA of youth self-ratings, data on 3 youth were eliminated because they had missing data for > 10% of their CAPS items. For the remaining youth, only 165 of the 103 (items)  $\times$  829 (participants) = 85,387 data points were missing (0.2%). These missing data points were spread over 119 youth. To avoid casewise deletion of these 119 youth, we assumed that this very small amount of information was missing at random, and the correlation matrix was reset to have a pairwise sample size of 829. As a check on this strategy, the EFA was repeated with all youth with any missing data eliminated with virtually identical results.

*Criteria for the number of factors to extract.* EFA allows the extraction of any number of factors up to the number of items in the item pool. Each solution is informative and there is not a widely accepted criterion for determining the "correct" number of factors to extract. For many purposes, this is a serious limitation of EFA. Because EFA is used in this study to generate hypotheses that will be tested in a separate sample, however, the fact that we cannot choose between, for example, a four-factor and a six-factor solution in EFA is not disadvantageous. The multiple possible solutions in EFA simply become alternative hypotheses that can be compared using CFAs in a new sample.

Nonetheless, to generate a tractable number of hypotheses from EFA, it is necessary to be guided by several considerations in deciding which solutions to examine. We first conducted parallel analysis to determine the number of factors that account for more variance than factors extracted from random data sets that parallel the study data set in terms of the numbers of items and cases (Horn, 1965; Glorfeld, 1995). We ran 500 parallel simulations based on random permutations of the study data to determine the 95th percentiles of the distribution of the eigenvalues for

each number of factors based on the distributional properties of the study data using the SAS program developed by O'Connor (2000). This provides a strong basis for determining the maximum number of factors that can be extracted (the last factor with an eigenvalue greater than the 95th percentile of eigenvalues derived from the random permutations). Second, because our goal is to generate hypotheses concerning sets of symptoms that reflect latent dimensions of psychopathology, a solution must be interpretable to provide the basis for a hypothesis (Fabrigar, Wegner, MacCallum, & Strahan, 1999). We viewed solutions as interpretable when every factor was defined by >1 item with a loading above the conventional standard of  $\geq .40$  on only that factor. In addition, the items loading on a factor must not all be lexically similar to one another. Finally, because *DSM-IV* distinguishes among four dimensions of disruptive behavior (inattention, HI, ODD, and CD), one dimension of depression, and six dimensions of anxiety (specific fears, agoraphobia, social anxiety, generalized anxiety, separation anxiety, and obsessions and compulsions), our a priori bias was to extract approximately 11 factors, if justified by other criteria.

*Congruence analyses.* Potential age and sex differences in factor structure were examined quantitatively using the congruence coefficient (Rummel, 1970), which measures the similarity in both the pattern and magnitudes of factor loadings for all items across factors.

*Analyses of functional impairment, distress, and adaptive functioning.* To determine whether the hypothesized factors generated by the EFAs could be viewed as likely candidates for dimensions of child and adolescent psychopathology, we assessed the association of each hypothesized dimension with measures of impairment, distress, and adaptive functioning. Solely in these analyses, we transformed the 0–3 ratings of psychopathology items into scores akin to "symptom counts." On the basis of the skewed distributions of psychopathology items in the present sample, and using the method used in previous studies using other psychopathology scales that use the same 0–3 ratings of items (Lahey et al., 1998; Pelham, Gnagy, Greenslade, & Milich, 1992), we counted the number of items with unique loadings of  $\geq .40$  on only the factors that were given a rating of *pretty much* or *very much*. This facilitates the interpretation of the odds ratios in terms of the number of items on a hypothesized dimension of psychopathology given extreme ratings. The logistic regression analyses were conducted controlling age and sex, and simultaneously entering counts for all of the hypothesized dimensions of psychopathology. Because these analyses are meant to be exemplary rather than definitive, we selected one EFA solution each for caretakers and youth to define the putative dimensions of psychopathology to limit the number of these analyses.

## Results

### *Adult Caretaker Ratings*

Table 2 presents the eigenvalues and the proportion of variance explained by each of the first 35 factors in the principal factor analyses of adult caretaker ratings, along with the results of the parallel analysis. Parallel analysis showed that the eigenvalue for the 30th factor was the last factor extracted in the study data with an eigenvalue greater than the 95th percentile of the distribution of eigenvalues for random permutations of the data. This indicates that as many as 30 factors that reflect nonrandom variance could be extracted.

The first 6 factors accounted for 73.3% of the explained variance, whereas the last 24 factors each accounted for  $\leq 2.5\%$  of the explained variance each. Moreover, when 30 factors were extracted, 16 of the 30 factors were uninterpretable, as 8 factors had no items with a loading  $\geq .40$  and 8 factors had only one item with a loading  $\geq .40$ . Five of the 30 factors were easily interpretable within the *DSM-IV* framework on the basis of the items with

Table 2  
Eigenvalues and the Proportion of Variance Explained by Each of the First 35 Factors in the Principal Factor Analyses of Adult Caretaker Ratings

No. factors extracted	Eigenvalues	95th %ile of random eigenvalues	Proportion of explained variance
1	28.583	0.847	.452
2	5.475	0.806	.087
3	4.515	0.777	.072
4	3.748	0.751	.059
5	2.293	0.729	.036
6	1.686	0.708	.027
7	1.596	0.690	.025
8	1.474	0.674	.023
9	1.365	0.658	.022
10	1.298	0.642	.021
11	1.124	0.626	.018
12	0.975	0.611	.015
13	0.926	0.596	.015
14	0.847	0.584	.013
15	0.790	0.570	.012
16	0.754	0.558	.012
17	0.717	0.546	.011
18	0.683	0.531	.011
19	0.655	0.519	.010
20	0.630	0.507	.010
21	0.602	0.493	.010
22	0.587	0.484	.009
23	0.535	0.473	.008
24	0.525	0.462	.008
25	0.521	0.452	.008
26	0.468	0.441	.007
27	0.490	0.431	.007
28	0.453	0.420	.007
29	0.445	0.410	.007
30	0.423	0.400	.007
31	<b>0.380</b>	<b>0.390</b>	.006
32	0.378	0.381	.006
33	0.362	0.372	.006
34	0.348	0.362	.006
35	0.322	0.350	.005

Note.  $N = 1,351$  after casewise deletion of 7 youth as a result of missing data on one or more items. Principle factor analyses are shown with the 95th percentile of the distribution of eigenvalues for each number of factors produced by 500 principal factor analyses of random permutations of the data (parallel analysis). Values in bold indicate the largest number of factors at which the study eigenvalue first exceeds the 95th percentile of the distribution of eigenvalues produced by factor analyses of random data.

loadings of  $\geq .40$  on each factor, however; they were Inattention (15 items), HI (15 items), ODD (9 items), Social Anxiety (5 items), and Separation Anxiety Disorder (SAD; 6 items). In addition, there were two factors composed of specific phobia items: Fear of Blood, Injections, Thunder, Animals and Insects (4 items), and Fear of High Places (3 items). *DSM-IV* symptoms of CD loaded on 4 separate factors in the 30-factor solution, however; they were Direct and Indirect Aggression (7 items), Status Offenses (2 items), Vandalism (2 items), and Lying to Con (1 item). Many symptoms of major depression and dysthymia loaded on two factors in the 30-factor solution: Dysphoria–Negative Rumination (5 items, with *sad or depressed* and *felt not good looking or smart* loading .38 and .37 on this factor, respectively) and Fatigue–Anhedonia (2 items, with *walked or talked slower, increase in appetite or weight*, and *anhedonia* loading .39, .38, and .36 on this

factor, respectively). In addition, a Somatic Complaints (3 items) factor emerged. Items related to overanxious disorder (OAD)/generalized anxiety, obsessions, and agoraphobia did not emerge as separate factors in the 30-factor solution.

At least some results of the 30-factor solution may suggest viable testable hypotheses. For example, dividing the symptoms of some *DSM-IV* disorders (e.g., specific phobias, conduct disorder, depression) into the multiple dimensions suggested by the 30-factor solution could prove to be more valid than the *DSM-IV* model in some cases. The 30-factor solution appeared to be considerably overfactored (Fabrigar et al., 1999), however, which tends to split meaningful factors into less meaningful subfactors. For this reason, we worked backwards from the 30-factor solution, extracting progressively fewer factors until all factors were interpretable.

*Six-factor solution.* Working backwards from the 30-factor solution for caretaker ratings, the greatest number of factors that could be extracted and still have all factors be interpretable was 6 (presented in Table 3). The 27 items with unique loadings of  $\geq .40$  on the first factor in the 6-factor model were symptoms of HI and ODD from the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed.; *DSM-III*; 3rd ed., rev.; *DSM-III-R*; American Psychiatric Association, 1980, 1987), and the *DSM-IV*, and several related behaviors from other sources (e.g., *got excited easily* and *clowned around*). The second factor was composed of six of the nine *DSM-IV* symptoms of major depression, three somatic complaint items, and two items referring to general tension. In addition, a *DSM-IV* symptom of ODD (*angry at people or things*) and the related item of *hostile* loaded  $\geq .40$  on the Depression factor, and *grouchy and irritable*, which is viewed as a substitute for dysphoria for children in *DSM-IV*, loaded  $\geq .40$  on both Depression and a factor consisting of symptoms of both hyperactivity–impulsivity and ODD.

Fifteen items had loadings of  $\geq .40$  on only the third factor (Inattention). These items were seven of the nine *DSM-IV* Inattention symptoms of ADHD. In addition, an eighth Inattention symptom (*dislikes or avoids tasks that require paying attention*) had loadings of  $\geq .40$  on both the Inattention and HI/ODD factors. The *DSM-IV* symptom of major depression of *difficulty thinking or deciding* and several items related to sluggish cognitive tempo and disorganization also loaded on the Inattention factor.

The fourth factor was composed of all seven of the *DSM-IV* symptoms of CD that were endorsed often enough to be included in the EFA. The *DSM-IV* ODD symptom of *spitefulness and vindictiveness*, the *DSM-III-R* ODD symptom of *swore or talked dirty*, and the *DSM-III-R* ADHD symptom of *got into a dangerous situation without thinking* also loaded uniquely on the CD factor. The remaining items loading uniquely on the CD factor included relational and reactive aggression items and the proactive aggression item of *used force to get what wanted*.

The fifth factor (SAD/Fears) consisted of four of the eight *DSM-IV* symptoms of SAD and a related symptom of agoraphobia (*afraid to leave the house alone*). In addition, one symptom of specific phobia (*afraid of thunder and lightning*) and two symptoms of OCD (*compulsive checking* and *compulsive counting*) loaded  $\geq .40$  on the SAD/Fears factor.

The sixth factor (Social Anxiety) consisted of four symptoms of *DSM-IV* social phobia, the related symptom of *DSM-III-R* OAD of *worried had made small mistakes in school, work, or other things*, and two items tapping the *DSM-IV* dysthymia symptoms of



Table 3  
*Factor Loadings From the Six-Factor Solution of the Principal Factor Analysis of Caretaker Ratings*

Emotion/behavior	HI/ODD	Depression	Inattention	CD	SAD/ fears	Social anxiety
Demanded attention from others	.63					
Interrupt or intrude on others	.63					
Ran or climbed when should not	.62					
Had trouble awaiting turn	.59					
Difficulty remaining seated	.59		.40			
Defied adult requests	.58					
Stubborn	.57					
Didn't listen to people	.55					
Loud or rowdy in public	.55					
Talked back to adults	.54					
Uncooperative	.54					
Lost temper	.54					
Whined and complained	.53					
Switched tasks repeatedly	.52					
Rude or acted smart	.51					
Fidgeted and squirmed in seat	.49					
Got excited easily	.48					
Clowned around	.48					
Always on the go or driven by motor	.47					
Blurted out answers	.47					
Noisy when having fun	.46					
Threatened to stop liking friends to coerce them	.44					
Argued with other kids	.44					
Broke the rules in games	.44					
Talked more than others	.44					
Blamed other for misdeeds	.42					
Got mad when teased	.40					
Annoyed others on purpose	.40					
Fatigue or low energy		.62				
Sad or depressed		.55				
Sleepy during the day		.52				
Tense/hard to relax		.52				
Anhedonia		.50				
Grouchy and irritable	.46	.49				
Headaches		.48				
Wanted to be alone		.47				
Angry at people or things		.45				
Hostile		.44				
Muscles felt tight		.43				
Insomnia		.41				
Walked or talked slower		.40				
Stomach aches		.40				
Separation headaches/stomach aches		.40				
Inattention to detail/careless mistakes			.67			
Disorganized			.67			
Trouble sustaining attention			.66			
Distractible			.64			
Trouble finishing tasks			.64			
Lost assignments or books			.63			
Procrastinated			.58			
Forgetful			.57			
Dislike or avoid paying attention	.42		.52			
Day-dreamed and lost in thoughts			.49			
Dawdled and worked slowly			.48			
Stared into space			.47			
Fiddled with small objects			.45			
Sloppy or messy			.44			
Took longer to answer than others			.44			
Difficulty thinking or deciding			.43			
Initiated physical fights				.59		
Spitefulness and vindictiveness				.59		
Spread rumors about disliked kids				.55		
Bullied				.54		
Family curfew violation				.52		
Teased in a mean way				.51		
Used force to get what wanted				.50		

Table 3 (continued)

Emotion/behavior	HI/ODD	Depression	Inattention	CD	SAD/ fears	Social anxiety
Theft without confrontation				.50		
Got into fights when frustrated				.50		
Lied to con				.47		
Got into danger without thinking				.47		
Swore and talked dirty				.47		
Truancy				.43		
Vandalism				.43		
Upset when not with you					.51	
Worried about loss of attachment figure					.48	
Need for attachment figure at bedtime					.46	
Afraid of thunder and lightning					.45	
Upset over separation					.45	
Compulsive checking					.43	
Afraid to leave house alone					.42	
Compulsive counting					.41	
Nervous doing things in front of people						.54
Worried had made fool of self						.50
Timid or shy						.45
Felt nervous in group of kids						.44
Not self-confident						.44
Felt not good looking or smart						.41
Worried had made small mistakes						.46

*Note.*  $N = 1,351$  after casewise deletion of 7 youth as a result of missing data on one or more items. For the principle factor analysis, we used varimax rotation of adult caretaker reports of the emotions and behaviors (137 items) of youth aged 4–17. HI = hyperactivity–impulsivity; ODD = oppositional defiant disorder; CD = conduct disorder; SAD = separation anxiety disorder. Only loadings of  $\geq .40$  are shown. Items with no loading of  $\geq .40$  on any factor in six-factor solution were as follows: *nervous when with strangers; feelings got hurt easily; let other kids tell what to do; worried before game or sport; unrealistic self-blame; talked less to other kids than usual; preferred to be with adults; got angry when failed; bragged; hummed and made odd noises; acted like someone younger; hopelessness; worried about being liked by others; worried had an illness; tearful or felt like crying; worried before tests; increase in appetite or weight; decrease in appetite or weight; arms and legs felt heavy; afraid to go to school; wrote critical notes about others when angry at them; restless, had to keep walking; mind started to go blank; lied to avoid doing something; broke own things on purpose; got angry when accidentally bumped; ruminated about bad things in past; stopped talking to kids when mad at them; washed compulsively; kept disliked kids out of group; afraid of dark; separation dreams; worried would be lost or kidnapped; obsessed about dirt and germs; afraid of being in crowded places; afraid of the sight of blood or cuts; other compulsions; wanted to stay home with attachment figure; afraid of insects or animals; afraid of bridges, tunnels, highways; confused; obsessive upsetting thoughts; afraid of shots or needles; repeatedly checked homework; compulsive organizing; afraid of pool, lake, or ocean; afraid of elevators or escalators; worried about being late; and afraid of high places.*

low self-esteem (*not self-confident* and *felt not good looking or smart*).

When maximum-likelihood factor analysis was conducted, the six-factor solution was almost identical, but the sixth factor consisted of only two items with loadings of  $\geq .40$  in both the varimax and promax rotations (*worried had made fool of self* and *worried had made small mistakes*), with a third item with a loading of  $\geq .35$  (*nervous doing things in front of people*). The two- through five-factor solutions were replicated in maximum-likelihood factor analysis very closely, indicating that only the sixth factor (Social Anxiety) in the six-factor solution was not fully robust across factor analytic methods.

Unit-weighted factor scores were created for each factor by taking the mean of ratings of all items with loadings of  $\geq .40$  on only that factor. The pattern of correlations among the six factor scores is presented in Figure 1. With few exceptions, the factor scores were substantially intercorrelated. For example, Inattention was correlated ( $r > .60$ ) with both HI/ODD and Depression/OAD, and HI/ODD was also correlated ( $r = .61$ ) with CD and ( $r = .59$ ) with Depression/OAD. Social Anxiety was correlated ( $r = .63$ )

with Depression/OAD. Other intercorrelations are more moderate, but only four of the correlations among the dimensions were  $< .40$ , three of which were correlations with SAD/Fears, which was the most independent of the dimensions in the six-factor solution.

*Five-factor solution.* To generate additional hypotheses for the optimal number of dimensions of psychopathology symptoms to be tested in CFA, and to generate hypotheses regarding the possibility of a hierarchical structure among the dimensions, we continued to work backwards in the number of factors extracted. The five-factor solution (Figure 1) was essentially identical to the six-factor solution, except that the Depression/OAD and Social Anxiety factors constituted a single factor in the five-factor solution. In contrast to the six-factor solution, the Dysthymia symptom of *hopelessness*, the alternative to dysphoria for children of *tearful or felt like crying*, and two additional *DSM-III-R* symptoms of OAD (*worried before a game or sport* and *worried had an illness*) also loaded  $\geq .40$  on this broad Depression/OAD/Social Anxiety factor.

*Four-factor solution.* The factor loadings for the four-factor solution are presented in Table 4 because this solution for care-

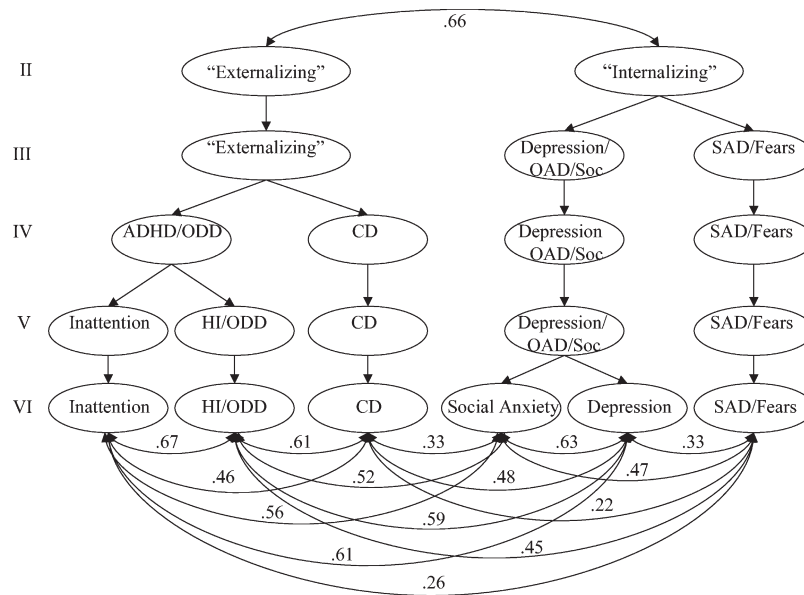


Figure 1. Summary of the two- through six-factor solutions for principal factor analysis of adult caretaker ratings of emotional and behavior problems, showing Pearson correlations among the factors in the two-factor and six-factor solutions derived from unit-weighted means of the items with loadings of  $\geq .40$  on only one factor. OAD = overanxious disorder; Soc = social anxiety; SAD = separation anxiety disorder; ADHD = attention-deficit/hyperactivity disorder; ODD = oppositional defiant disorder; CD = conduct disorder; HI = hyperactivity-impulsivity.

taker ratings provides a useful point of comparison to the EFA of youth self-ratings. The four-factor solution was similar to the five-factor solution, except that many items that loaded  $\geq .40$  on the Inattention and HI/ODD factors in the five- and six-factor solutions loaded on a single broad ADHD/ODD factor in the four-factor solution. The merging of the Inattention and HI/ODD factors in the four-factor solution resulted in the loss of many of the items that defined these dimensions in the six-factor solution. Two Inattention items from the six-factor solution loaded  $\geq .40$  on the Depression/OAD/Social Anxiety factor in the four-factor solution (*difficulty thinking and deciding* and *stared into space*). Similarly, two oppositional items from the six-factor HI/ODD factor loaded  $\geq .40$  on both the ADHD/ODD and CD factors in the four-factor solution (*annoyed others on purpose* and *rude or acted smart*), and five other oppositional items for the six-factor HI/ODD dimension failed to load at  $\geq .40$  on any factor when four factors were extracted.

**Three-factor solution.** In the three-factor solution, most items loading  $\geq .40$  on the ADHD/ODD and CD factors in the four-factor solution loaded on a single externalizing problems factor, but the Depression/OAD/Social Anxiety and SAD/Fears factors were quite similar to the corresponding factors in the four-factor solution.

**Two-factor solution.** When only two factors were extracted, they represented externalizing and internalizing problems as in previous studies (Achenbach, 1985), with the items loading on the Depression/OAD/Social Anxiety and SAD/Fears factors emerging on a single factor. Unit-weighted factor scores for these two broad dimensions were substantially correlated ( $r = .66$ ).

#### Follow-Up EFA of Inattention, Hyperactivity-Impulsivity, and Oppositional Symptoms

Many previous studies using EFA and CFA suggested that inattention, hyperactivity-impulsivity, and oppositional symptoms constitute three separate factors (Beiser et al., 2000; Burns, Walsh, Owen, et al., 1997; Burns, Walsh, Patterson, et al. 1997; Collett et al., 2000; DuPaul et al., 1998; Gomez et al., 1999; Molina et al., 2001). Because these studies used less comprehensive item pools than did the current study (i.e., they typically included only symptoms of ADHD and ODD), we conducted a follow-up EFA of only items loading  $\geq .40$  on either the Inattention or HI/ODD factors. Consistent with most previous studies, when we extracted three factors, which represented inattention, hyperactivity-impulsivity, and oppositional symptoms (results available from the authors upon request). It should be noted, however, that two previous studies (Burns et al., 2001; Pillow et al., 1998) found that the best fitting CFA models that allowed cross-loadings of the HI items, specified as measuring impulsivity in *DSM-IV* items on the ODD factor, fit better than models specifying ODD and HI as independent dimensions. These two studies provide some support for the alternative hypothesis that HI and ODD are not independent dimensions.

#### Age and Sex Differences in the Structure of Caretaker Ratings

The invariance across age of the four- and six-factor solutions for caregiver reports was evaluated by repeating the principal factor analyses separately for 4-10-year-olds and 11-17-year-olds, using the items shown in Table 3 (except that truancy was

Table 4  
*Factor Loadings From the Four-Factor Solution of the Principal Factor Analysis of Caretaker Ratings*

Emotion/behavior	ADHD/ ODD	Depression/ OAD/Social	CD	SAD/ Fears	Emotion/behavior	ADHD/ ODD	Depression/ OAD/Social	CD	SAD/ Fears
Distractible	.68				Worried had an illness		.44		
Inattention to detail/careless mistakes	.68				Headaches		.44		
Trouble sustaining attention	.67				Felt nervous in group of kids		.43		
Difficulty remaining seated	.66				Walked or talked slower		.43		
Dislike or avoid paying attention	.63				Unrealistic self-blame		.43		
Didn't listen to people	.60				Worried had made small mistakes		.43		
Procrastinated	.59	.41			Stared into space		.42		
Trouble finishing tasks	.58				Nervous doing things in front of people		.42		
Interrupt or intrude on others	.58				Obsessive upsetting thoughts		.42		
Disorganized	.58				Ruminated about bad things in past		.42		
Fidgeted and squirmed in seat	.58				Timid or shy		.41		
Defied adult requests	.57		.46		Confused		.40		
Switched tasks repeatedly	.54				Talked less to other kids than usual		.40		
Forgetful	.54				Spitefulness and vindictiveness			.59	
Lost assignments or books	.52	.41			Initiated physical fights			.57	
Dawdled and worked slowly	.52			.41	Used force to get what wanted			.55	
Ran or climbed when should not	.52				Bullied			.55	
Fiddled with small objects	.50				Hostile			.52	
Noisy when having fun	.49				Got into fights when frustrated			.52	
Talked back to adults	.49		.40		Swore and talked dirty			.52	
Uncooperative	.49				Teased in a mean way			.52	
Blurted out answers	.49				Theft without confrontation			.50	
Had trouble awaiting turn	.49				Lied to con			.50	
Stubborn	.48				Spread rumors about disliked kids			.49	
Clowned around	.48				Rude or acted smart	.40		.48	
Sloppy or messy	.47				Family curfew violation			.48	
Loud or rowdy in public	.47		.44		Vandalism			.46	
Always on the go or driven by motor	.46				Got into danger without thinking			.46	
Demanded attention from others	.46				Annoyed others on purpose	.44		.44	
Day-dreamed and lost in thoughts	.45	.43			Broke own things on purpose			.43	
Blamed other for misdeeds	.45				Lost temper			.43	
Got excited easily	.43				Got angry when accidentally bumped			.42	
Talked more than others	.43				Angry at people or things			.41	
Restless had to keep walking	.42				Need for attachment figure at bedtime			.58	
Lied to avoid doing something	.40		.40		Upset when not with you			.55	
Sad or depressed		.61			Upset over separation			.53	
Fatigue or low energy		.60			Afraid of thunder and lightning			.51	
Not self confident		.57			Afraid of dark			.50	
Worried before tests		.55			Worried about loss of attachment figure			.44	
Anhedonia		.54			Afraid to leave house alone			.43	
Felt not good looking or smart		.51			Worried would be lost or kidnapped			.41	
Sleepy during the day		.49			Feelings got hurt easily			.40	
Tense/hard to relax		.49			Wanted to stay home with attachment			.40	
Wanted to be alone		.48							
Difficulty thinking or deciding		.47							
Separation headaches/stomach aches		.46							
Hopelessness		.46							
Worried had made fool of self		.45							
Worried about being liked by others		.44							

*Note.*  $N = 1,351$  after casewise deletion of 7 youth as a result of missing data on one or more items. For the principle factor analysis, we used varimax rotation of adult caretaker reports of the emotions and behaviors (137 items) of boys and girls aged 4–17. ADHD = attention-deficit/hyperactivity disorder; ODD = oppositional defiant disorder; OAD = overanxious disorder; Social = social anxiety; CD = conduct disorder; SAD = separation anxiety disorder. Only loadings of  $\geq .40$  are shown. Items with no loading of  $\geq .40$  on any factor in the four-factor solution were as follows: *argued with other kids; acted like someone younger; took longer to answer than others; got mad when teased; whined and complained; hummed and made odd noises; let other kids tell what to do; worried before game or sport; stomachaches; mind started to go blank; muscles felt tight; nervous when with strangers; insomnia; afraid to go to school; decrease in appetite or weight; preferred to be with adults; arms and legs felt heavy; got angry when failed; increase in appetite or weight; worried about being late; other compulsions; truancy; broke the rules in games; threatened to stop liking friends to coerce them; grouchy and irritable; stopped talking to kids when mad at them; wrote critical notes when angry; kept disliked kids out of group; washed compulsively; bragged; afraid of the sight of blood or cuts; separation dreams; afraid of insects or animals; tearful or felt like crying; afraid of being in crowded places; obsessed about dirt and germs; afraid of pool, lake, or ocean; compulsive counting; compulsive organizing; afraid of shots or needles; compulsive checking; afraid of bridges, tunnels, highways; afraid of elevators or escalators; repeatedly checked homework; and afraid of high places.*

dropped because it was never endorsed for 4–10-year-olds). Using congruence analysis (Rummel, 1970), the four-factor solution yielded factors that ranged from being virtually identical to being highly similar in the younger and older age groups (congruence coefficients: ADHD/ODD, .97; CD, .92; Depression/OAD/Social, .89; and SAD/Fears, .85). In contrast, some of the factors emerging in the six-factor solution were only moderately congruent across age (congruence coefficients: Inattention, .93; CD, .93; SAD/Fears, .92; Depression, .78; Social Anxiety, .70; and HI/ODD, .52). This suggests potential age differences in the structure of depression, social anxiety, hyperactivity-impulsivity, and ODD. Among older youth, items referring to fatigue, anhedonia, and somatic complaints had higher loadings on the Depression factor than they did among younger youth, whereas OAD symptoms loaded more prominently on Depression among the younger youth. The Social Anxiety factor had twice the number of items with loadings  $\geq .40$  among older youth, mostly because a number of items reflecting negative self-evaluation were more strongly related to this dimension at older ages. Similarly, unlike among younger youth, dysphoria and anhedonia had loadings  $\geq .40$  on both the Depression and Social Anxiety factors among older youth. The greatest age difference was found in the structure of the HI and ODD items, however. For younger youth, HI items loaded primarily on the same factor as ODD items, but among older youth, HI items loaded weakly with Inattention items and ODD items emerged as a distinct factor.

When separate principal factor analyses were conducted for girls and boys using the caretaker-rated items in Table 3, the results were difficult to compare. The greatest number of interpretable factors for girls was four, but the four-factor solution for boys was not similar enough to the four-factor solution for girls to conduct quantitative comparisons. When five factors were extracted for boys, however, a CD factor emerged for boys that was not part of the four-factor solution for girls (items referring to fighting, lying, and vandalism, loaded with HI and ODD items among girls, whereas other CD items did not load on any factor), but the other four factors were very similar across sex (congruence coefficients: Depression/OAD, .94; Inattention, .94; HI/ODD, .92; and SAD/Fears, .86). This suggests that CD may not constitute a dimension that is separate from HI/ODD in 4–17-year-old girls, but there appears to be little sex difference in other dimensions. The exception is some potential sex difference in SAD/Fears. For both sexes, SAD symptoms loaded primarily on this factor, but fear items also loaded substantially on SAD/Fears among girls, whereas OCD items loaded more prominently on this factor among boys.

### Youth Self-Ratings

Table 5 presents the eigenvalues and the proportion of variance explained by each of the first 25 factors in the principal factor analyses of youth self-ratings, along with the results of the parallel analysis.

As described in the *Data Analysis* section, EFA of youth reports were conducted first by resetting the correlation matrix to have a pairwise sample size of 829. In addition, we conducted EFA of youth reports allowing casewise deletion of cases with missing data on at least one item to allow direct comparison with the parallel analysis, which was also based on casewise deletion. Parallel analysis showed that the eigenvalue for the 17th factor was

the last factor extracted in the EFA of the study data using casewise deletion that has an eigenvalue greater than the 95th percentile of the distribution of eigenvalues for that number of factors extracted from random permutations of the data. This indicated that as many as 17 factors that reflect nonrandom variance could be extracted. Together, the first 3 factors accounted for 67.6% of the explained variance, whereas the last 10 of these 17 factors accounted for  $< 2.5\%$  of the explained variance each. Moreover, the majority of the factors were not interpretable in the 17-factor solution. Six of the 17 factors were interpretable on the basis of items with loadings of  $\geq .40$  on each factor: that is, symptoms of major depression, dysthymia, and OAD (29 items), aggressive and nonaggressive CD behaviors (22 items), symptoms of SAD (9 items), fear of heights and vehicles (4 items), social anxiety (4 items), and compulsions and obsessions (6 items). In addition, there were two items with loadings of  $\geq .40$  on the seventh factor (*feelings got hurt easily* and *afraid to leave the house alone*), and two items with loadings of  $\geq .40$  on the eighth factor (*suicidal behavior* and *hopelessness*). Two factors had only one item with a loading of  $\geq .40$  (*truancy* and *spread rumors about disliked kids*) and the remaining 7 factors had no items with loadings of  $\geq .40$ . Because comparison of the parallel analysis to the eigenvalues in the EFA based on no casewise deletion suggested that only as many as 15 factors could be extracted, we also examined the 15-factor solution. The results were virtually identical to the 17-factor solution, except for there being fewer factors with no items with loadings of  $\geq .40$ .

*Three-factor solution.* Working backwards from the 17-factor solution, the first solution in which all factors contained at least one item with a loading of  $\geq .40$  was the easily interpreted three-factor solution. As shown in Table 6, the first factor extracted consisted of symptoms of major depression, dysthymia, OAD, and social anxiety. The second factor consisted of all nine *DSM-IV* symptoms of CD with rates of endorsement that were high enough to include in the EFA and four items referring to similar delinquent behaviors not included in the *DSM-IV* definition of CD (*received or fenced stolen property, used force to get what wanted, made prank telephone calls, and avoided paying for things*). Other items with unique loadings of  $\geq .40$  on the CD factor included a *DSM-IV* symptom of ODD (*spitefulness and vindictiveness*), a *DSM-III-R* symptom of ODD (*swore and talked dirty*), and several similar items from other sources (e.g., *hostile*). Several items reflecting relational, reactive, and proactive aggression and a *DSM-III-R* symptom of ADHD (*got into danger without thinking*) also loaded uniquely on the CD factor. The *DSM-IV* symptom of OCD of *had urge to do something bad in public* also loaded on the CD factor, suggesting a misunderstanding of its intended meaning. To determine whether this item influenced the results, we repeated the EFA without it, but found virtually identical results. The third factor consisted of a range of symptoms of SAD, phobia, and OCD.

As shown in Figure 2, unit-weighted factor scores for youth-reported Depression/OAD/Social Anxiety was correlated with SAD/Fears at  $r = .69$  and was correlated with CD at  $r = .50$ . The correlation between CD and SAD/Fears was more moderate at  $r = .33$ .

*Two-factor solution.* When two factors were extracted for youth reports, the items loading on the Depression/OAD/Social Anxiety and SAD/Fears factors loaded on a single broad Internalizing factor, which was correlated at  $r = .47$  with CD.

Table 5  
*Eigenvalues and the Proportion of Variance Explained by Each of the First 25 Factors in the Principal Factor Analyses of Youth Self-Ratings*

No. factors extracted	Eigenvalues without casewise deletion <sup>a</sup>	Eigenvalues with casewise deletion <sup>b</sup>	95th %ile of random eigenvalues	Proportion of explained variance
1	22.994	23.487	1.066	.484
2	6.275	6.360	0.997	.132
3	2.835	2.908	0.955	.060
4	1.450	1.531	0.916	.030
5	1.400	1.421	0.883	.030
6	1.268	1.338	0.852	.027
7	1.235	1.285	0.820	.026
8	1.144	1.161	0.796	.024
9	1.005	1.107	0.771	.021
10	0.857	0.927	0.747	.018
11	0.791	0.861	0.722	.017
12	0.742	0.827	0.702	.016
13	0.714	0.789	0.681	.015
14	0.692	0.709	0.659	.015
15	0.658	0.700	0.639	.014
16	0.612	0.656	0.619	.013
17	0.574	0.614	0.601	.012
18	0.551	<b>0.575</b>	<b>0.585</b>	.012
19	0.526	0.555	0.567	.011
20	0.496	0.525	0.550	.010
21	0.468	0.506	0.531	.010
22	0.462	0.477	0.514	.010
23	0.422	0.448	0.498	.009
24	0.405	0.441	0.481	.008
25	0.387	0.437	0.466	.008

*Note.*  $N = 829$  after 3 youth were deleted because of missing data on more than 10% of the items. Principle factor analyses are shown with the 95th percentile of the distribution of eigenvalues for each number of factors produced by 500 principal factor analyses of random permutations of the data (parallel analysis). The values in bold indicate the largest number of factors at which the study eigenvalue first exceeds the 95th percentile of the distribution of eigenvalues produced by factor analyses of random data.

<sup>a</sup>  $N = 829$  with no casewise deletion as a result of missing data. <sup>b</sup>  $n = 710$  after casewise deletion of 119 of 829 youth as a result of missing data on one or more items.

### *Sex Differences in the Structure of Youth Rating*

Because youth ratings were not obtained below 9 years of age, it was not possible to conduct analyses of invariance across age comparable with those conducted for caretaker reports. Congruence analysis (Rummel, 1970) was conducted to assess the invariance of the three-factor solution shown in Table 6 across sex. Three-factor solutions for girls and boys were qualitatively and quantitatively highly similar (congruence coefficients: Depression/OAD/Social, .96; SAD/Fears, .95; and CD, .93).

### *Internal Consistency, Reliability, and Cross-Informant Correlations*

For the four- and six-factor solutions for adult caretaker reports and for the three-factor solution for youth reports, test-retest reliability over 7–14 days was assessed for unit-weighted factor scores. Test-retest Pearson correlations, intraclass correlations, and Cronbach's alphas for each dimensional score are presented in Table 7. These indicate that all of the hypothesized dimensions are highly reliable, both in the sense of internal consistency and short-term stability.

Correlations between informants on ratings of psychopathology are shown in Table 8 for 9–17-year-old youth. Unit-weighted

factor scores based on the three-factor solution for youth reports and the corresponding factors in the most similar solution for caretaker reports (the four-factor solution) were found to be correlated in the range of  $r = .44$  to  $r = .50$ . These cross-informant correlations are substantial, particularly considering that the corresponding factor scores are based on somewhat different items for each informant. From a multitrait-multimethod perspective (D. T. Campbell & Fiske, 1959), it is important that the magnitudes of the correlations across informants for corresponding dimensions are significantly greater than all other correlations with other dimensions in the same row and column using Steiger's (1980) test for dependent correlations. This suggests that the corresponding dimensions identified in the three-factor solution for youth and the four-factor solution for caretakers are measuring similar characteristics of the youth's maladaptive behavior and emotions.

### *Associations With Measures of Impairment*

Ultimately, any hypothesized dimensions of psychopathology must be shown to interfere with adaptive functioning; otherwise it cannot be viewed as a dimension of psychopathology. Longitudinal studies are required to demonstrate which symptoms cause impairment and distress, but at a minimum, one must demonstrate

Table 6  
*Factor Loadings From the Three-Factor Solution of the Principal Factor Analysis of Youth Ratings*

	Depression/ OAD/social	CD	SAD/ fears		Depression/ OAD/social	CD	SAD/ fears
Felt not good looking or smart	.65			Swore and talked dirty			.55
Fatigue or low energy	.64			Theft without confrontation			.54
Sleepy during the day	.63			Had urge to do something bad in public			.54
Tense/hard to relax	.59			Family curfew violation			.54
Difficulty thinking or deciding	.58			Used force to get what wanted			.53
Worried before tests	.56			Got into danger without thinking			.53
Wanted to be alone	.56			Vandalism			.52
Not self-confident	.56			Got kids to gang up on disliked kids			.51
Tearful or felt like crying	.55			Bullied			.50
Confused	.55			Made prank telephone calls			.49
Worried about being liked by others	.54			Cruelty to others			.49
Worried had made small mistakes	.53			Got angry when accidentally bumped			.47
Mind started to go blank	.52			Hostile			.46
Sad or depressed	.52			Cheated on school tests			.46
Anhedonia	.52			Broke own things on purpose			.46
Unrealistic self-blame	.51			Got into fights when frustrated			.45
Grouchy and irritable	.50			Avoided paying for things			.44
Worried had made fool of self	.49			Spread rumors about disliked kids			.42
Angry at people or things	.49			Truancy			.40
Decrease in appetite or weight	.49			Need for attachment figure at bedtime			.67
Hopelessness	.48			Upset when not with you			.65
Insomnia	.48			Worried about loss of attachment figure			.60
Increase in appetite or weight	.48			Upset over separation			.58
Worried before game or sport	.48			Worried would be lost or kidnapped			.52
Timid or shy	.47			Separation dreams			.50
Got angry when failed	.46			Compulsive checking			.50
Worried about being late	.46			Obsessed about dirt and germs			.49
Feelings got hurt easily	.45			Obsessive upsetting thoughts	.41		.48
Muscles felt tight	.44			Afraid of thunder and lightning			.48
Nervous when with strangers	.44			Afraid of bridges, tunnels, highways			.48
Walked or talked slower	.43			Separation headaches/stomachaches			.48
Hummed and made odd noises	.43			Afraid of being in crowded places			.47
Arms and legs felt heavy	.42			Afraid of elevators or escalators			.46
Ruminated about bad things in past	.42			Wanted to stay home with attachment figure			.45
Talked less to kids than usual	.41			Afraid of shots or needles			.43
Felt nervous in group of kids	.40			Repeatedly checked homework			.43
Lied to con		.67		Washed compulsively			.43
Used weapon		.65		Afraid leave house alone			.42
Initiated physical fights		.63		Afraid of sight of blood or cuts			.42
Spitefulness and vindictiveness		.60		Afraid of cars, buses or trains			.40
Received or fenced stolen property		.60		Afraid of dark			.40
Teased in a mean way		.58		Other compulsions			.40
Lied to avoid doing something		.56					

*Note.* For the principle factor analysis, we used varimax rotation of youth reports of emotions and behaviors (103 items) for youth aged 9–17. OAD = overanxious/generalized anxiety disorder; CD = conduct disorder; SAD = separation anxiety disorder. Loading of  $\geq .40$  are shown. Does not include attention-deficit/hyperactivity and oppositional defiant disorder items. Items with no loading of  $\geq .40$  on any factor in four-factor solution were as follows: *stomach aches; nervous doing things in front of people; headaches; let other kids tell what to do; wrote critical notes about others when angry at them; acted like someone younger; kept disliked kids out of group; bragged; stopped talking to kids when mad at them; suicidal behavior; afraid of high places; afraid of pool, lake, or ocean; worried had an illness; compulsive counting; afraid go to school; afraid of insects or animals; compulsive organizing; and preferred to be with adults.*

that hypothesized dimensions of psychopathology exhibit cross-sectional correlations with impairment to consider them likely dimensions of psychopathology. Therefore, to begin to assess the external validity of the hypothesized dimensions of psychopathology induced from the present EFAs in these terms, we assessed the association of counts of the number of items with unique loadings  $\geq .40$  on each factor that were given ratings of *pretty much* or *very much* with dichotomous measures of functional impairment, distress, and adaptive functioning in the youth.

As shown in Table 9, when the youth's age and sex were controlled, and all hypothesized dimensions of psychopathology in

the six-factor solution for caretakers (and the three-factor solution for youth in separate analyses) were included as predictors, each putative dimension of psychopathology accounted for unique variance in the prediction of at least one measure of impaired adaptive functioning or distress. For example, the odds ratio of 1.39 indicates that the odds of not having a close friend in the past 12 months reported by the caretaker are 39% greater at each greater number of the 14 caretaker-reported social anxiety symptoms. Similarly, for youth-reported symptoms and adaptive functioning, the odds ratio of 0.93 for having been *away from home for at least several days in a row. . . like staying with friends or relatives or*

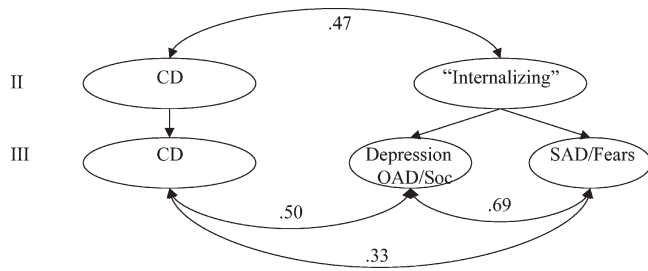


Figure 2. Summary of the two- and three-factor solutions for principal factor analysis of youth ratings of emotional and behavior problems, showing Pearson correlations among the factors in the two-factor and three-factor solutions derived from unit-weighted means of the items with loadings of  $\geq .40$  on only one factor. CD = conduct disorder; OAD = overanxious disorder; Soc = social anxiety.

going to camp during the past 12 months indicates that the odds were 7% lower at each greater number of the eight SAD/Fears items rated *pretty much* or *very much*, controlling for sex, age, and all other symptom dimensions. Other odds ratios have the same interpretation, but because the numbers of items in the count of each hypothesized dimension differ, one cannot directly compare the magnitudes of association across dimensions.

### Discussion

In the present study, EFAs of caretaker ratings and youth self-ratings of emotions and behaviors were conducted to induce new

Table 7  
Test-Retest Reliability and Internal Consistency of Unit-Weighted Total Factor Scores (Mean of All Nonmissing Items With Loadings of  $\geq .40$  on Only That Factor) For Each Informant

	Test-retest		Cronbach's $\alpha$
	r	ICC	
Adult caretaker reports (four-factor solution)			
ADHD/ODD	.91	.89	.94
CD	.88	.87	.90
Depression/OAD/Social Anxiety	.88	.85	.91
SAD/fears	.84	.83	.80
Adult caretaker reports (six-factor solution)			
Inattention	.91	.90	.92
HI/ODD	.89	.87	.94
CD	.88	.87	.86
Depression/OAD	.86	.84	.87
SAD/Fears	.84	.83	.73
Social Anxiety	.84	.81	.85
Youth reports (three-factor solution)			
CD	.87	.85	.92
Depression/OAD/Social Anxiety	.81	.74	.94
SAD/Fears	.84	.78	.90

Note. All correlations and ICCs are significant at  $p < .0001$ . ADHD/ODD = attention-deficit/hyperactivity disorder/oppositional defiant disorder; CD = conduct disorder; OAD = overanxious disorder; SAD = separation anxiety disorder; HI/ODD = hyperactivity-impulsivity/oppositional defiant disorder; ICC = intraclass correlations.

Table 8  
Pearson Correlations Among Unit-Weighted Factor Scores on the Basis of the Three-Factor Solution for Youth Reports and the Four-Factor Solution for Adult Caretaker Reports for 9–17-Year-Old Youth ( $n = 826$ )

Youth factor scores	Adult caretaker factor scores			
	ADHD/ODD	CD	Depression/OAD/social anxiety	SAD/fears
CD	.38	<b>.50</b>	.26	.05
Depression/OAD/social anxiety	.34	.26	<b>.45</b>	.27
SAD/fears	.28	.18	.34	<b>.49</b>

Note. All correlations are significant at  $p < .0001$ . The correlations between corresponding youth and caretaker factor scores are significantly greater than for all other correlations in the same row and column ( $p < .001$ ), using Fisher's  $r$ -to- $z$  transformation for within-sample comparisons. Correlations between corresponding youth and caretaker factor scores are in bold. ADHD/ODD = attention-deficit hyperactivity/oppositional defiant disorder; CD = conduct disorder; OAD = overanxious disorder; SAD = separation anxiety disorder.

hypotheses regarding the factor structure of a new measure of prevalent problems of behavior and emotion in children and adolescents. For both informants, parallel analyses (Glorfeld, 1995; Horn, 1965) suggested that a large number of factors could be extracted without exceeding the number of factors extracted from EFAs of random data with the same characteristics. Working backwards, the first solution for each informant in which all factors were interpretable extracted far fewer factors than the maximum allowed by parallel analysis. In addition, working backwards from the first fully interpretable solution for each informant continued to yield interpretable solutions until two factors were extracted for both informants. This provided us with a range of data-based hypotheses for the structure of this broad set of child and adolescent psychopathology items that should be tested in future studies.

Before considering the hypotheses yielded by these analyses, it is important to consider how the limitations of EFA may have influenced the results. Statistically, EFA suffers from underidentification and the lack of a strong method for determining the number of factors to extract (Fabrigar et al., 1999). In addition, it is likely that a fundamental assumption underlying EFA cannot be met by ratings of psychopathology. In EFA, the error in rating each item is assumed to be uncorrelated with the error in rating each other item. This assumption would not be met, for example, if raters were globally influenced by negative halo effects or implicit theories of psychopathology. The likely result of violating the assumption of uncorrelated error would be to incorrectly conclude that some items loaded on multiple factors and to underextract factors. For these reasons, EFA cannot be used to reach conclusions about the structure of psychopathology, but can be used only as a means of generating hypotheses to be tested in separate samples using CFA and external validation methods that are not limited in the same ways as is EFA.

To conduct such comparative tests of hypotheses, however, a new instrument was needed with a sufficiently comprehensive set of items. The present EFA of this instrument yielded a new set of alternative hypotheses that differ from the *DSM-IV*, the *ICD-10*,  
*(text continues on page 377)*



Table 9  
*Odds Ratios (OR; Adjusted for Age and Sex) and Wald Chi-Squares For the Association Between Each Hypothesized Dimension of Psychopathology and Measures of Functional Impairment, Distress, and Adaptive Functioning*

Informant and report type	<i>n</i>	Inattention	HI/ODD	CD	Depression/OAD	SAD/fears	Social anxiety
Six-factor solution							
Adult caretaker—functional impairment and distress							
Annoy others <sup>a</sup>	1,358	1.31 (1.19–1.44) 32.99 (.0001)	1.09 (1.02–1.17) 6.80 (.01)	1.58 (1.19–2.10) 10.08 (.002)			0.83 (0.70–0.99) .49 (.04)
Distress	1,356				1.44 (1.23–1.69) 20.70 (.0001)		
Academic work <sup>b</sup>	1,304	1.58 (1.46–1.71) 127.79 (.0001)					
Suspended/expelled <sup>c</sup>	1,283			1.84 (1.30–2.60) 11.66 (.001)			
Police contact	1,358	0.80 (0.65–0.97) 4.90 (.03)		1.89 (1.26–2.86) 9.26 (.003)			
No close friend	1,357			1.36 (1.07–1.73) 6.51 (.02)	0.78 (0.62–0.99) 4.09 (.05)		1.39 (1.21–1.60) 21.39 (.0001)
Unintentional injury	1,356			1.32 (1.05–1.64) 5.89 (.02)			
Adult caretaker—adaptive functioning							
Visiting overnight	1,358	1.06 (1.00–1.12) 4.35 (.04)				0.85 (0.75–0.97) 6.23 (.01)	
Club or team	1,358					0.80 (0.69–0.92) 10.07 (.002)	
Job outside home <sup>d</sup>	300			0.75 (0.62–0.90) 9.47 (.003)			
Youth—functional impairment and distress							
Annoying others <sup>a</sup>	826				1.32 (1.04–1.67) 5.37 (.03)		0.75 (0.60–0.94) 6.28 (.02)
Academic work <sup>b</sup>	812			1.31 (1.01–1.71) 4.15 (.05)			
Distress	825						
No close friend	823				1.38 (1.14–1.66) 11.52 (.001)		
					1.30 (1.01–1.67) 4.19 (.05)		

Table 9 (continued)

Informant and report type	<i>n</i>	Inattention	HI/ODD	CD	Depression/OAD	SAD/fears	Social anxiety
Six-factor solution (continued)							
Youth—functional impairment and distress (continued)							
Unintentional injury	826						
OR (CI)		1.16 (1.07–1.25)		1.29 (1.04–1.61)	0.82 (0.68–1.00)		
$\chi^2$ ( <i>p</i> <)		12.88 (.0003)		5.15 (.03)	3.96 (.05)		
Youth—adaptive functioning							
Visiting overnight	825						
OR (CI)				0.77 (0.61–0.96)			
$\chi^2$ ( <i>p</i> <)				5.21 (.03)			
Club or team	826						
OR (CI)							
$\chi^2$ ( <i>p</i> <)							
Job outside home <sup>d</sup>	288						0.76 (0.60–0.94)
OR (CI)							6.26 (.02)
$\chi^2$ ( <i>p</i> <)							
Three-factor solution							
Adult caretaker—functional impairment and distress							
Annoyed others <sup>a</sup>	826						
OR (CI)				1.24 (1.11–1.39)			
$\chi^2$ ( <i>p</i> <)				14.00 (.0002)			
Distress	826						
OR (CI)							
$\chi^2$ ( <i>p</i> <)							
Academic work <sup>b</sup>	816						
OR (CI)				1.16 (1.05–1.30)			
$\chi^2$ ( <i>p</i> <)				8.07 (.005)			
Suspended/expelled <sup>c</sup>	795						
OR (CI)				1.38 (1.22–1.57)	0.91 (0.84–0.97)	1.21 (1.08–1.36)	
$\chi^2$ ( <i>p</i> <)				25.16 (.0001)	7.67 (.006)	10.14 (.002)	
Police contact	826						
OR (CI)				1.36 (1.18–1.57)	0.90 (0.82–0.99)		
$\chi^2$ ( <i>p</i> <)				17.05 (.0001)	4.91 (.03)		
No close friend	826						
OR (CI)							
$\chi^2$ ( <i>p</i> <)							
Unintentional injury	825						
OR (CI)							
$\chi^2$ ( <i>p</i> <)							
Adult caretaker—adaptive functioning							
Visiting overnight	826						
OR (CI)				1.05 (1.01–1.08)	0.92 (0.86–0.98)	6.66 (.01)	
$\chi^2$ ( <i>p</i> <)					6.17 (.02)		
Club or team	826						
OR (CI)					1.11 (1.05–1.18)	0.84 (0.77–0.92)	
$\chi^2$ ( <i>p</i> <)					13.09 (.0003)	13.24 (.0003)	
Job outside home <sup>d</sup>	289						0.88 (0.77–0.99)
OR (CI)					1.07 (1.01–1.13)	4.29 (.04)	
$\chi^2$ ( <i>p</i> <)					5.95 (.02)		

(table continues)

Table 9 (continued)

Informant and report type	<i>n</i>	Inattention	HI/ODD	CD	Depression/OAD	SAD/fears	Social anxiety
Three-factor solution (continued)							
Youth—functional impairment and distress							
Annoyed others <sup>a</sup>	832			1.27 (1.12–1.44)			
OR (CI)				14.50 (.0001)			
$\chi^2$ ( <i>p</i> <)							
Distress	831				1.17 (1.10–1.24)		
OR (CI)					27.10 (.0001)		
$\chi^2$ ( <i>p</i> <)							
No close friend	829						
OR (CI)							
$\chi^2$ ( <i>p</i> <)							
Unintentional injury	832			1.13 (1.03–1.24)			
OR (CI)				6.41 (.02)			
$\chi^2$ ( <i>p</i> <)							
Youth—adaptive functioning							
Visiting overnight	831						
OR (CI)					1.04 (1.01–1.08)	0.93 (0.87–1.00)	
$\chi^2$ ( <i>p</i> <)					5.31 (.03)	4.27 (.04)	
Club or team	832						
OR (CI)					1.08 (1.02–1.15)		
$\chi^2$ ( <i>p</i> <)					7.15 (.008)		
Job outside home <sup>d</sup>	832						
OR (CI)							
$\chi^2$ ( <i>p</i> <)							

*Note.* Results are from joint logistic regression models in which age, gender, and all hypothesized dimensions for each informant were used as predictors (all tests, *df* = 1). Only associations significant at *p* < .05 are reported (some odds ratios were rounded up or down to 1.00). Odds ratios less than 1.0 indicate an inverse association. HI/ODD = hyperactivity–impulsivity/oppositional defiant disorder; CD = conduct disorder; OAD = overanxious disorder; SAD = separation anxiety disorder; CI = 95% confidence intervals of odds ratios.

<sup>a</sup> Top 5% of the sample distribution on the mean of ratings of four items covering the frequency during the last 12 months of the following: caretakers being annoyed with the youth, peers being annoyed with the youth, having trouble completing home/schoolwork, and teachers/bosses being annoyed with the youth. <sup>b</sup> For youth who attend school are home schooled. <sup>c</sup> For youth who attend school. <sup>d</sup> For 15–17-year-old youth only.

and the implicit taxonomies underlying existing rating scales. Until the internal and external validity of these new hypotheses is tested, they have the same scientific status as other existing taxonomic hypotheses, which were themselves developed on the basis of EFA at best, and on subjective clinical impressions at worst.

### *General Hypotheses Regarding the Factor Structure of Child and Adolescent Psychopathology*

The present findings suggest the following general hypotheses regarding the structure of the more prevalent forms of child and adolescent psychopathology:

1. When only two dimensions were extracted for both caretaker and youth reports, the familiar broadband internalizing and externalizing syndromes (Achenbach, 1985) emerged. When additional factors were extracted, the items in those two broad factors split into progressively more specific factors, particularly in the EFAs of caretaker reports. This raises the possibility that the structure of child and adolescent psychopathology is hierarchical, with more specific dimensions representing correlated facets of the broader dimensions.
2. Correlations among factor scores were generally substantial, so much so that the term *independent dimensions of psychopathology* must be viewed as relative in most cases. This was particularly true for, but not limited to, the more specific factors that split from broader factors when greater numbers of factors were extracted in the EFAs. Especially when two factors are correlated with one another at levels that approach their reliability estimates, it is important to use tests of external validity to decide whether they are distinct enough to distinguish in taxonomic models.

It is important to note that moderate to high correlations among dimensions of psychopathology are not unique to the CAPS, but are also found in other psychopathology rating scales, such as the CBCL (Achenbach, 1991a; Hinden, Compas, Howell, & Achenbach, 1997), the CPRS-R (Conners et al., 1998), and the *DSM-IV* symptom rating scales (Hartman et al., 2001). Similarly, high levels of comorbidity have been found in population-based studies that used categorical diagnoses (Angold, Costello, & Erkanli, 1999; Lahey et al., 1999; Nottelmann, & Jensen, 1995). Substantial intercorrelation appears to be an inherent characteristic of child and adolescent psychopathology.

3. Items that are used in slightly different forms in the *DSM-IV* as symptoms of more than one disorder generally did not load consistently on one factor. For example, the item of *grouchy and irritable* is used in the *DSM-IV* as a symptom of generalized anxiety disorder, ODD, major depression, and mania. Consistent with this usage, *grouchy and irritable* loaded on both HI/ODD and Depression/OAD (which includes several symptoms of generalized anxiety disorder) in the six-factor solution for caretakers. This means that using *grouchy and irritable* to define both ODD and major depression in the *DSM-IV*

increases the correlation between the two dimensions and decreases their distinctness. As suggested by Rutter (1997), it may be useful to reconsider the use of such symptoms in future nomenclatures.

4. Each hypothesized dimension of psychopathology was uniquely associated with at least one indicator of adaptive impairment or distress. This suggests that the hypothesized dimensions of CAPS items can be tentatively considered to represent psychopathology. Psychopathology researchers have paid far less attention to the development of strong measures of impairment and distress than to the development of measures of psychopathology, however. As a result, the present findings regarding impairment and distress should be interpreted cautiously. For example, the present measures of impairment and distress may be more sensitive to disruptive behavior than emotional problems, and the wording of the present measure of distress (*feeling happy and content*) may not be independent enough from dysphoria to be an appropriate external criterion measure for depression. Moreover, existing measures of functional impairment, including the measures used in the present study, have not been independently validated using criteria other than the psychopathology items that they were developed to validate. As a result, the present measures of impairment and distress set no more than a minimum standard for assessing this defining feature of psychopathology. Much additional research is needed on the relation between the hypothesized dimensions of psychopathology defined in all taxonomies to measures of impairment and distress.

### *New Hypotheses Regarding the Structure of ADHD, ODD, and CD*

The results of the present analyses suggest the following new specific hypotheses regarding the latent structure of attention problems and disruptive behavior:

1. HI and ODD items did not load on separate factors, even in the five- and six-factor solutions. In contrast, Inattention was found to be separable from HI/ODD in both the five- and six-factor solutions for caretaker ratings in the full sample of girls and boys. Inattention and HI/ODD were substantially correlated ( $r = .67$ ), however, even in the six-factor solution (Figure 1). For these reasons, when fewer than five factors were extracted, ADHD and ODD items loaded on a single factor. Indeed, Inattention, HI, and ODD items loaded on three different factors only in the 30-factor solution and in the follow-up EFA of only Inattention, HI, and ODD items.

There was little evidence of sex differences in the structure of Inattention, but the modest level of congruence for HI/ODD between 4–10 year olds and 11–17 year olds suggests that the structure of these symptoms changes with age. Among children, HI loaded strongly on the same factor as ODD, with some HI items also loading modestly on Inattention. During adolescence, however, when the prevalences of both HI and ODD are lower than

in childhood, ODD emerged as a separate factor. During adolescence, most HI items did not load with ODD, but some loaded  $\geq .40$  on Inattention.

Thus, the present findings suggest three alternative hypotheses that can be compared with one another and with other taxonomic hypotheses for ADHD and ODD in CFA and external validation studies: (a) ADHD and ODD items constitute a single dimension, (b) Inattention and HI/ODD items constitute 2 dimensions, and (c) Inattention, HI, and ODD constitute three separate dimensions as in the *DSM-IV*. Because the factor structure of these symptoms may be qualified by developmental changes, however, it will be important to test for age differences in future hypothesis-testing studies.

2. Consistent with previous studies (Lahey, Carlson, & Frick, 1997), a number of items reflecting sluggish cognitive tempo (Carlson & Mann, 2002; McBurnett et al., 2001) loaded on the Inattention factor (*procrastinated, daydreamed and lost in thoughts, dawdled and worked slowly, stared into space, and took longer to answer than others*) in the five- and six-factor solutions for caretaker reports. Although these items did not emerge as a separate factor, it is still possible that they could play an important role in defining the predominantly inattentive subtype of ADHD (Milich, Balentine, & Lynam, 2001). Because youth meeting criteria for the predominantly inattentive subtype of ADHD have been shown to be more likely to exhibit the sluggish cognitive tempo symptoms than youth meeting criteria for the combined type (Lahey, Carlson, & Frick, 1997), it is possible that different subsets of inattention symptoms would best define the two subtypes (but see Lahey, 2001, for cautionary notes).
3. All the *DSM-IV* symptoms of CD that were included in the EFA had unique loadings of  $\geq .40$  on the CD factor in the four-, five-, and six-factor solutions for caretaker reports and the three-factor solution for youth reports. In addition, a range of related aggressive and nonaggressive delinquency items from other sources loaded with the CD items. For both informants, several items that appear to reflect relational aggression (*spread rumors about disliked kids, made prank telephone calls, and teased in a mean way*) loaded on the CD factor, but a separate relational aggression factor did not emerge in any solution. In the six-factor solution for caretakers, one proactive aggression item (*used force to get what wanted*) and one reactive aggression item (*got into fights when frustrated*) loaded on the CD factor. In addition, one reactive aggression item loaded in the HI/ODD factor in six-factor solution for caretakers (*got angry when accidentally bumped*). Similarly, in the three-factor solution for youth reports, one proactive aggression item (*got kids to gang up on disliked kids*) and two reactive aggression items (*got angry when accidentally bumped* and *got into fights when frustrated*) loaded on the CD factor. Thus, although a number of reactive and proactive aggression items appear to be part of the hypothesized CD dimension (and

one may be part of the hypothesized HI/ODD dimension), the reactive and proactive aggression items were not found to constitute separate dimensions of psychopathology when factored in this item pool. Consistent with the *DSM-IV*, therefore, the present findings suggest the hypothesis that CD symptoms constitute a dimension of psychopathology that is relatively distinct from other hypothesized dimensions. In contrast, inconsistent with the *ICD-10* and the taxonomic model underlying the CBCL and the RBPC (Achenbach, 1991a; Quay & Peterson, 1982), the combination of ODD and aggressive CD behaviors did not emerge as a factor that was distinct from nonaggressive CD behaviors in any solution. Two behaviors currently viewed as symptoms of ODD (the *DSM-IV* ODD symptom of *spitefulness and vindictiveness*, and the *DSM-III-R* ODD symptom of *swore or talked dirty*) did load with CD behaviors, however. These findings do not resolve differences among these taxonomies regarding disruptive behavior, of course, but they set up alternative hypotheses for future tests using CFA and external validation methods that can directly contribute to the resolution of questions about the structure of disruptive behavior.

The only potentially important sex difference to emerge from the present analyses is that a separate CD factor emerged for boys, but not for girls, in the EFA of caretaker reports. In the EFA of youth reports, however, a CD factor emerged among both girls and boys that was highly congruent across sex. For this reason, it seems very unlikely that the sex difference in caretaker reports indicates the absence of a separate dimension of CD among girls. Rather, caretakers may be even less aware of the antisocial behavior of their daughters than of their sons.

#### *New Hypotheses Regarding the Structure of Anxiety and Depression*

Consistent with recent taxonomic studies in adult samples (Kendler et al., 2003; Krueger, 1999; Vollebergh et al., 2001), the present findings for caretaker and youth informants suggest that at least two types of anxiety can be distinguished in children and adolescents (i.e., separation anxiety, fears, obsessions and compulsions vs. generalized tension and worries, and perhaps social anxiety). On the other hand, symptoms of generalized and perhaps social anxiety symptoms may well be part of the same dimension as symptoms of depression.

1. When three or more factors were extracted for each informant, a factor composed of symptoms of SAD, specific phobia, and obsessions and compulsions was found to be separate from other types of emotional problems for both informants. This factor included the agoraphobia symptom of *afraid to leave the house alone* for both informants and also included the agoraphobia symptoms regarding fears of crowds, vehicles, and bridges and tunnels for youth informants. This suggests the hypothesis that a broad dimension of SAD/Fears that subsumes several of the *DSM-IV* anxiety disorders can be distin-

guished in children and adolescents. The common feature that links this set of items appears to be fear of physical harm. The specific phobia and agoraphobia items clearly reflect fear of objects and situations perceived as harmful, and the symptoms of SAD may reflect anxiety over separation from adults who can protect the youth from harm. Similarly, items like *compulsive checking*, *compulsive washing*, *worried had sickness*, and *obsessing about dirt and germs* may describe worries about harm and actions taken to avoid perceived risks.

In both the 30-factor solution for caretakers and the 17-factor solution for youth, 3 separate factors representing SAD, fears, and compulsions emerged. This suggests the possibility that the broad dimension of fear of physical harm can be parsed into a number of correlated, but validly distinct subfactors that more closely resemble *DSM-IV* anxiety disorders in future studies using different statistical methods or types of samples. Such a finding would be consistent with the previous findings of Spence (1997). On the other hand, it is also possible that *DSM-IV* differentiates more dimensions of fear of physical harm than can be validly distinguished.

There was little evidence of developmental differences in the structure of SAD/Fears. The EFA of caretaker ratings suggested that specific fears are more strongly related to SAD items than are OCD items among girls, whereas the opposite was found among boys. This was not confirmed in the congruence analysis of youth ratings, however, suggesting that it may be limited to caretaker perceptions.

2. For both informants, when  $\geq 3$  factors were extracted, symptoms of depression and OAD/generalized anxiety loaded on a factor that was separate from SAD/Fears. Hartman et al. (2001) similarly found that symptoms of depression were substantially correlated with symptoms of generalized anxiety in children and adolescents. In addition, studies of the structure of psychopathology in population-based samples of adults (Kendler et al., 2003; Krueger, 1999; Vollebergh et al., 2001) have found that two factors of anxiety and depressive disorders best fit the data: (a) major depression, dysthymia, and generalized anxiety disorder; and (b) specific phobia, social phobia, agoraphobia, and panic disorder.

The question of whether anxiety and depression can be differentiated in youth has long been of interest (e.g., Brady & Kendall, 1992). We agree with Mineka, Watson, and Clark (1998), however, that researchers who have asked if depression and anxiety are separable dimensions may have asked the wrong question. The present findings are consistent with the possibility that some aspects of anxiety (SAD, fears, obsessions, and compulsions) are reasonably distinct from depression, whereas other types of anxiety (OAD/generalized anxiety and perhaps social anxiety) are so highly correlated with depression that they may be best viewed as part of the same dimension.

Except for the six-factor solution for caretakers, which split social anxiety from depression and OAD items, the items loading uniquely on the Depression/OAD/Social Anxiety factor in the

EFAs of both informants indicate that youth with high scores on this dimension tend to be insecure, shy, socially anxious, and self-blaming. This includes symptoms of the *DSM-IV* major depression and dysthymia (*felt not good looking or smart*, *not self-confident*, and *unrealistic self-blame*), the *DSM-III-R* OAD (*worried about being liked by others*), and the *DSM-IV* social phobia (*felt nervous in group of kids*; *worried had made fool of self*; and *timid or shy*). Similarly, a number of symptoms of the *DSM-III-R* OAD that loaded uniquely on the Depression/OAD/Social Anxiety factor appear to reflect performance anxiety, which may also indicate anxiety regarding social evaluation (*worried before tests*, *worry had made small mistakes*, *worried about being late*, and *worried before game or sport*).

These findings are consistent with previous findings and several key aspects of theories of vulnerability to depression (e.g., Hankin & Abramson, 2001; Robinson, Garber, & Hilsman, 1995) in showing that youth who exhibit symptoms of depression have negative views of themselves and their social and academic abilities (Altmann & Gotlib, 1988; Tram & Cole, 2000), engage in rumination about upsetting events (Nolen-Hoeksema, 2000), and are self-blaming. The present findings are also consistent with interpersonal theories regarding the central roles played by shyness (Joiner, 1997) and rejection sensitivity (Downey, Lebolt, Rincon, & Freitas, 1998) in the origins of depression. Rejection sensitivity refers to the emotion-laden anticipation of, readiness to perceive, and exaggerated reactions to, incidents of social rejection (such as criticism or exclusion from parties). Although much has been made recently of the role of rejection sensitivity in depression, the *DSM-IV* text states that "hypersensitivity to criticism, negative evaluation, or rejection" and "low self-esteem and feelings of inferiority" are also common associated features of social phobia. (p. 413) Thus, the emergence of a broad Depression/OAD/Social Anxiety factor in youth ratings and the substantial correlation between the Depression/OAD and Social Anxiety factors when they are extracted as separate factors in the six-factor solution for caretaker ratings are consistent with the view that social insecurity (and the shyness and rejection sensitivity associated with it) is a fundamental feature of depression, OAD, and social anxiety, and may be the "glue" that holds the Depression/OAD/Social Anxiety factor together.

There was little evidence of sex differences in the structure of depression, OAD/generalized anxiety, and social anxiety in either caretaker or youth ratings, but there was evidence suggesting possible differences in factor structure across age. Items referring to fatigue, anhedonia, and somatic concerns loaded more strongly with other depression items among older than younger youth. In contrast, OAD symptoms loaded more prominently with core depression items among younger youth. These findings are consistent with the meta-analytic review by Weiss and Garber (2003) that suggested that fatigue, anhedonia, and somatic concerns become increasingly stronger correlates of other features of depression as the prevalence of these symptoms increases with age.

In the 30-factor solution for caretakers, there were also indications of possible informant-specific factors for emotional problems. For example, in CFA one could test the comparative fits for caretaker reports of models in which Dysphoria-Rumination, Fatigue-Anhedonia, and Somatic Complaints were specified as separate but correlated dimensions, or specified as a single depression dimension, or were considered to be facets of a higher order Depression/OAD/Social Anxiety dimension.

It is interesting to compare the present findings and hypotheses regarding emotional problems with the dimensional structure of the CBCL (Achenbach, 1991a). Except for the 30-factor solution for caretaker reports and the 17-factor solution for youth reports, the present findings are consistent with the CBCL in identifying a broad factor consisting of many depression and anxiety symptoms. Unlike the CBCL, however, a second factor of anxiety symptoms that reflects SAD, fears, obsessions, and compulsions emerged in most solutions. This difference may simply be the result of the CBCL item pool including fewer items reflecting the latter kinds of anxiety symptoms than the CAPS item pool.

#### *Item Pools and the Frame of Reference for Taxonomic Studies*

The follow-up EFA of ADHD and ODD items suggested that the failure to extract separate Inattention, HI, and ODD factors (in anything but the apparently overfactored 30-factor solution) was a result of the comprehensiveness of the full CAPS item pool. When only ADHD and ODD items were factored, three dimensions emerged as in previous studies. It is possible that this failure to extract separate ADHD and ODD factors is the result of the stronger participant-to-item ratio when fewer items are factored. It may also be due to a lack of “resolution” resulting from not meeting the assumption of uncorrelated error. When a broader set of items is factored, correlated errors may have a greater impact.

The follow-up EFA of ADHD and ODD items raises an important question about the creation of item pools for factor analytic studies. Is it more useful to study restricted item pools, such as only ADHD and ODD symptoms, or better to analyze more comprehensive pools? Which strategy provides the most valid results? For a number of reasons, we take the position that it is essential to study the structure of child and adolescent psychopathology using an item pool that covers a relatively comprehensive range of emotional and behavior problems. First, broad item pools are essential for identifying items that are thought to be a symptom of one disorder, but are more strongly related to another disorder. In the present study, for example, although *spiteful and vindictive* is considered to be a symptom of ODD in the *DSM-IV*, it appears to be more strongly correlated with symptoms of CD. Second, only studies of relatively comprehensive item pools can evaluate the advantages and disadvantages of allowing some symptoms, such as irritability, to be part of the diagnostic definition of multiple disorders. Perhaps most importantly, comprehensive item pools are important because much is learned by seeing where items factor in the context of symptoms of other kinds of psychopathology. For example, the tendency for HI and ODD items to factor together in the full item pool forces us to think carefully about, and to design studies to evaluate, the degree to which these symptoms are meaningfully distinct.

This is not to say, however, that there are not also advantages to taking a “bottom up” approach to studying the structure of child and adolescent psychopathology. Examining the structure of only ADHD items, for example, may identify potentially important fine distinctions among dimensions that would be difficult to detect in more comprehensive item pools. For the reasons noted above, however, we believe that studies of only limited item pools are unlikely to lead to the most valid hypotheses. Studies of more comprehensive item pools are a necessary part of the scientific mix.

#### *Future Studies Needed to Resolve Differences Among Taxonomies of Child and Adolescent Psychopathology*

The present study has generated additional hypotheses regarding the latent structure of child and adolescent psychopathology using the kind of item pool necessary for comparing the existing competing taxonomies. Choosing among these alternative taxonomies will require many kinds of comparative tests of their internal and external validity (Cantwell & Baker, 1988):

##### *Internal Validation*

One important next step is to directly assess the internal validity of the competing taxonomic hypotheses by comparing their fit with the data using CFA and related methods. The present findings suggest that hypotheses for the structure of child and adolescent psychopathology that are different from the *DSM-IV*, the *ICD-10*, and other models should be included in such studies. In a similar vein, Hartman et al. (2001) has conducted CFAs of parent- and teacher-rated items from existing population- and clinic-based samples in several countries. The item pools varied across samples, but each included many of the *DSM-IV* symptoms (and some symptoms not used in the *DSM-IV*) of the disruptive behavior disorders, depression, and generalized anxiety. Unlike the present study, however, symptoms of SAD, social phobia, specific phobias, agoraphobia, OCD, and somatic complaints were not included in the Hartman et al. (2001) item pool. Nonetheless, their item pool was the most comprehensive item pool studied to date. They found that a six-factor model developed on the basis of the *DSM-IV* (inattention, HI, ODD, CD, generalized and social anxiety, and depression) fit the data better than a number of alternative models (e.g., a two-factor internalizing and externalizing model and a model specifying three factors of ADHD, internalizing, and externalizing symptoms), but even the six-factor *DSM-IV* model did not fit the data adequately according to fit statistics. A post hoc modified model in which all items were allowed to load on any factor that improved consistency with the covariance structure fit better and revealed that many items hypothesized to reflect one dimension actually loaded as strongly, or more strongly, on another dimension. Thus, these findings suggest that there is considerable room to improve on the internal validity of the *DSM-IV* taxonomy.

##### *External Validation*

It is also essential to comparatively evaluate alternative taxonomic hypotheses using at least four kinds of tests of their external validity.

*External correlates of dimensions.* If a putative dimension of psychopathology fails to have at least some external correlates (i.e., features that are not part of the definition of the dimension) that distinguish it from other putative dimensions of psychopathology, there would be little use in distinguishing that dimension. Important external criteria include functional impairment, family history of psychopathology, risk factors, and age and sex differences. In addition, a broad range of laboratory studies could be conducted to determine whether a set of hypothesized dimensions have unique anatomical, physiological, cognitive, or other correlates.

Consider the example of HI and ODD in the context of external validity. Because the present findings raised a question about the independence of these putative dimensions, it is unfortunate that little is currently known about their external correlates. It is known that both dimensions are rated more highly in boys than girls, and that ratings of both dimensions decline from early childhood through adolescence (Lahey et al., 1999). Almost all previous external validation studies have not distinguished HI from the diagnosis of ADHD, however. Because there is emerging evidence that ADHD and ODD may be associated with different kinds of peer relationship problems (Frankel & Feinberg, 2002; Gadow & Nolan, 2002), it is possible that the specific dimensions of HI and ODD differ in their correlate peer difficulties. Because the diagnosis of ADHD is also based on inattention symptoms, however, one cannot draw that conclusion at present. Systematic research on similarities and differences in the validating correlates of HI and ODD and other hypothesized dimensions is sorely needed.

*Genetic and environmental influences.* Multivariate behavior genetic analyses of genetically informative samples can test the external validity of competing taxonomic hypotheses in particularly revealing ways. That is, one could test the hypothesis that two dimensions are independent in terms of their etiologic influences by estimating the extent to which their genetic and environmental influences overlap. For example, if HI and ODD are found to have some unique genetic or environmental influences, that would constitute a reason for distinguishing between them. Previous studies have found that the genetic and environmental influences on the diagnoses of ADHD and ODD overlap to a high degree (Burt, Krueger, McGue, & Iacono, 2003; Coolidge, Thede, & Young, 2000; Silberg et al., 1996; Waldman, Rhee, Levy, & Hay, 2001). This suggests that HI and ODD may not differ in their causal influences, but no study has directly looked at HI independent of the diagnosis of ADHD. The same methods could be used to test the external validity of any set of putative dimensions.

As candidate genes continue to be identified, it also should be possible to test the external validity of hypothesized dimensions of psychopathology by determining whether they show unique relations to high-risk alleles or haplotypes. For example, there is emerging evidence that variants in the dopamine receptor D4 gene (DRD4) are related to the inattention dimension, whereas alleles of the dopamine transporter gene (DAT1) are related to both HI and ODD (Waldman et al., 2001). If confirmed, such findings would provide strong support for the hypothesis that inattention differs from HI and ODD in terms of its specific genetic risk factors, but would suggest that HI and ODD may not have distinct associations with these particular candidate genes.

*Longitudinal studies of developmental course.* Longitudinal studies are also needed to fully evaluate hypotheses regarding the structure of child and adolescent psychopathology. For example, emerging evidence suggests that OAD/generalized anxiety and social anxiety in children and adolescents predict future levels of depression, controlling for initial levels of depression (Cole, Peeke, Martin, Truglio, & Seroczynski, 1998; Mineka et al., 1998), but childhood SAD and specific phobias do not. If such findings are confirmed, they would not only support the external validity of these two putative broad dimensions of anxiety, but would provide the basis for preventive interventions to reduce prevalence of adolescent depression. Longitudinal studies are particularly informative when conducted using genetically informative samples. For example, Kendler et al. (1992) hypothesized that generalized anx-

iety disorder and depression during adulthood have the same genetic influences, but are differentiated by environmental influences. This could mean that genetically predisposed youth may manifest a relatively stable mixture of OAD/generalized anxiety, social anxiety, and some depression symptoms over time, but only experience increased levels of depression following stressful life events. Such hypotheses could be tested in longitudinal studies of genetically informative samples.

*Differential response to treatment.* Different responses to pharmacologic and psychosocial treatments would, of course, constitute very strong support for distinctions among hypothesized dimensions. Demonstrations of differential response would require more systematic comparisons of the hypothesized dimensions than has characterized previous treatment outcome research, which has understandably been focused on identifying effective and efficacious treatments.

## References

- Achenbach, T. M. (1978). The Child Behavior Profile: I. Boys aged 6–11. *Journal of Consulting and Clinical Psychology, 46*, 478–488.
- Achenbach, T. M. (1985). *Assessment and taxonomy of child and adolescent psychopathology*. Beverly Hills, CA: Sage.
- Achenbach, T. M. (1991a). *Manual for the Child Behavior Checklist/4–18 and 1991 profile*. Burlington: University of Vermont, Department of Psychiatry.
- Achenbach, T. M. (1991b). *Manual for the Youth Self-Report and 1991 profile*. Burlington: University of Vermont, Department of Psychiatry.
- Achenbach, T. M., Conners, C. K., Quay, H. C., Verhulst, F. C., & Howell, C. T. (1989). Replication of empirically derived syndromes as a basis for taxonomy of child/adolescent psychopathology. *Journal of Abnormal Child Psychology, 17*, 299–323.
- Achenbach, T. M., & Edelbrock, C. S. (1979). The Child Behavior Profile: II. Boys aged 12–16 and girls aged 6–11 and 12–16. *Journal of Consulting and Clinical Psychology, 47*, 223–233.
- Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin, 101*, 213–232.
- Altmann, E. O., & Gotlib, I. H. (1988). The social behavior of depressed children: An observational study. *Journal of Abnormal Child Psychology, 16*, 29–44.
- American Association for Public Opinion Research. (2000). *Standard definitions: Final dispositions of case codes and outcome rates for surveys*. Ann Arbor, MI: Author.
- American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC: Author.
- American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed., rev.). Washington, DC: Author.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Angold, A., Costello, E. J., & Erkanli, A. (1999). Comorbidity. *Journal of Child Psychology and Psychiatry, 40*, 57–87.
- Beiser, M., Dion, R., & Gotowiec, A. (2000). Structure of attention-deficit and hyperactivity symptoms among native and non-native elementary school children. *Journal of Abnormal Child Psychology, 28*, 425–437.
- Bird, H. R., Gould, M. S., & Staghezza, B. (1992). Aggregating data from multiple informants in child psychiatry epidemiological research. *Journal of the American Academy of Child and Adolescent Psychiatry, 31*, 78–85.
- Birmaher, B., Khetarpal, S., Brent, D., Cully, M., Balach, L., Kaufman, J., & Neer, S. M. (1997). The Screen for Child Anxiety Related Emotional Disorders (SCARED): Scale construction and psychometric character-



- istics. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 545–553.
- Boyle, M. H., Offord, D. R., Racine, Y., Szatmari, P., Fleming, J. E., & Sanford, M. (1996). Identifying thresholds for classifying childhood psychiatric disorder: Issues and prospects. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35, 1440–1448.
- Brady, E. U., & Kendall, P. C. (1992). Comorbidity of anxiety and depression in children and adolescents. *Psychological Bulletin*, 111, 244–255.
- Burns, G. L., Boe, B., Walsh, J. A., Sommers-Flannagan, R. & Teegarden, L. A. (2001). A confirmatory factor analysis on the *DSM-IV* ADHD and ODD symptoms: What is the best model for the organization of these symptoms? *Journal of Abnormal Child Psychology*, 29, 339–349.
- Burns, G. L., Walsh, J. A., Owen, S. M., & Snell, J. (1997). Internal validity of attention deficit hyperactivity disorder, oppositional defiance disorder, and overt conduct disorder symptoms in young children: Implications from teacher ratings for a dimensional approach to symptom validity. *Journal of Clinical Child Psychology*, 26, 266–275.
- Burns, G. L., Walsh, J. A., Patterson, D. R., Holte, C. S., Sommers-Flannagan, R., & Parker, C. M. (1997). Internal validity of disruptive behavior disorder symptoms: Implications from parent ratings for a dimensional approach to symptom validity. *Journal of Abnormal Child Psychology*, 25, 307–319.
- Burt, S. A., Krueger, R. F., McGue, M., & Iacono, W. (2003). Parent-child conflict and the comorbidity among childhood externalizing disorders. *Archives of General Psychiatry*, 60, 505–513.
- Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 56, 81–105.
- Campbell, M. A., & Rapee, R. M. (1994). The nature of feared outcome representations in children. *Journal of Abnormal Child Psychology*, 22, 99–111.
- Cantwell, D. P., & Baker, L. (1988). Issues in the classification of child and adolescent psychopathology. *Journal of the American Academy of Child and Adolescent Psychiatry*, 27, 521–533.
- Carlson, C. L., & Mann, M. (2002). Sluggish cognitive tempo predicts a different pattern of impairment in the attention deficit hyperactivity disorder, predominantly inattentive type. *Journal of Clinical Child and Adolescent Psychology*, 31, 123–129.
- Chorpita, B. F., Albano, A. M., & Barlow, D. H. (1998). The structure of negative emotions in a clinical sample of children and adolescents. *Journal of Abnormal Psychology*, 107, 74–85.
- Cochran, W. G. (1977). *Sampling techniques*. New York: John Wiley.
- Cole, D. A., Peeke, L. G., Martin, J. M., Truglio, R., & Seroczynski, A. D. (1998). A longitudinal look at the relation between depression and anxiety in children and adolescents. *Journal of Consulting and Clinical Psychology*, 66, 451–460.
- Cole, D. A., Truglio, R., & Peeke, L. (1997). Relation between symptoms of anxiety and depression in children: A multitrait-multimethod-multigroup assessment. *Journal of Consulting and Clinical Psychology*, 65, 110–119.
- Collett, B. R., Crowley, S. L., Gimpel, G., A., & Greenson, J. N. (2000). The factor structure of *DSM-IV* attention deficit-hyperactivity symptoms: A confirmatory factor analysis of the ADHD-SRS. *Journal of Psychoeducational Assessment*, 18, 361–373.
- Compas, B. E., & Oppedisano, G. (2000). Mixed anxiety/depression in childhood and adolescence. In A. J. Sameroff, M. Lewis, & S. M. Miller (Eds.), *Handbook of developmental psychopathology* (2nd ed., pp. 531–548). New York: Kluwer Academic/Plenum.
- Conners, C. K. (1969). A teacher rating scale for use in drug studies with children. *American Journal of Psychiatry*, 126, 884–888.
- Conners, C. K., Sitarenios, G., Parker, J. D. A., & Epstein, J. N. (1998). The revised Conners' Parent Rating Scale (CPRS-R): Factor structure, reliability, and criterion validity. *Journal of Abnormal Child Psychology*, 26, 257–268.
- Coolidge, F. L., Thede, L. L., & Young, S. E. (2000). Heritability and the comorbidity of attention deficit hyperactivity disorder with behavioral disorders and executive function deficits: A preliminary investigation. *Developmental Neuropsychology*, 17, 273–287.
- Crick, N. R., & Grotpeter, J. K. (1995). Relational aggression, sex, and social-psychological adjustment. *Child Development*, 66, 710–722.
- Dodge, K. A., & Coie, J. D. (1987). Social information processing factors in reactive and proactive aggression. *Child Development*, 67, 993–1002.
- Downey, G., Lebolt, A., Rincon, C., & Freitas, A. L. (1998). Rejection sensitivity and children's interpersonal difficulties. *Child Development*, 69, 1074–1091.
- DuPaul, G. J., Anastopoulos, A. D., Power, T. J., Reid, R., Ikeda, M. J., & McGoey, K. E. (1998). Parent ratings of attention-deficit/hyperactivity disorder symptoms: Factor structure and normative data. *Journal of Psychopathology and Behavioral Assessment*, 20, 83–102.
- Edelbrock, C., Costello, A., Dulcan, M., Kalas, R., & Conover, N. (1985). Age differences in the reliability of the psychiatric interview of the child. *Child Development*, 56, 265–275.
- Elliott, D. S., Huizinga, D., & Ageton, S. S. (1985). *Explaining delinquency and drug use*. Beverly Hills, CA: Sage.
- Fabrigar, L. R., Wegner, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, 4, 272–299.
- Fergusson, D. M., Horwood, L. J., & Lynskey, M. T. (1994). Structure of *DSM-III-R* criteria for disruptive childhood behaviors: Confirmatory factor models. *Journal of the American Academy of Child and Adolescent Psychiatry*, 33, 1145–1155.
- Frankel, F., & Feinberg, D. (2002). Social problems associated with ADHD vs. ODD in children referred for friendship problems. *Child Psychiatry and Human Development*, 33, 125–146.
- Frick, P. J., Lahey, B. B., Applegate, B., Kerdyck, L., Ollendick, T., Hynd, G. et al. (1994). *DSM-IV* field trials for the disruptive behavior disorders: Symptom utility estimates. *Journal of the American Academy of Child and Adolescent Psychiatry*, 33, 529–539.
- Frick, P. J., Lahey, B. B., Loeber, R., Tannenbaum, L., Van Horn, Y., Christ, M. A. G., et al. (1993). Oppositional defiant disorder and conduct disorder: A meta-analytic review of factor analyses and cross-validation in a clinic sample. *Clinical Psychology Review*, 13, 319–340.
- Gadow, K. D., & Nolan, E. E. (2002). Differences between preschool children with ODD, ADHD and ODD+ADHD symptoms. *Journal of Child Psychology and Psychiatry*, 43, 191–201.
- Glorfeld, L. W. (1995). An improvement on Horn's parallel analysis methodology for selecting the correct number of factors to retain. *Educational and Psychological Measurement*, 55, 377–393.
- Gomez, R., Harvey, J., Quick, C., Scharer, I., & Harris, G. (1999). *DSM-IV* AD/HD: Confirmatory factor models, prevalence, and sex and age differences based on parent and teacher ratings of Australian primary school children. *Journal of Child Psychology and Psychiatry*, 40, 265–274.
- Gorsuch, R. L. (1997). New procedure for extension analysis in exploratory factor analysis. *Educational and Psychological Measurement*, 57, 725–740.
- Goodman, S. H., Lahey, B. B., Fielding, B., Dulcan, M., Narrow, W., & Regier, D. (1997). Representativeness of clinical samples of youth with mental disorders: A preliminary population-based study. *Journal of Abnormal Psychology*, 106, 3–14.
- Hankin, B. L., & Abramson, L. Y. (2001). Development of sex differences in depression: An elaborated cognitive vulnerability-transactional stress theory. *Psychological Bulletin*, 127, 773–796.
- Hart, E. L., Lahey, B. B., Loeber, R., & Hanson, K. S. (1994). Criterion validity of informants in the diagnosis of disruptive behavior disorders in children: A preliminary study. *Journal of Consulting and Clinical Psychology*, 62, 410–414.
- Hartman, C., Hox, J., Mellenbergh, G. J., Boyle, M. H., Offord, D. R., Racine, Y., et al. (2001). *DSM-IV* internal construct validity: When a

- taxonomy meets data. *Journal of Child Psychology and Psychiatry*, 42, 817–836.
- Hinden, B. R., Compas, B. E., Howell, D. C., & Achenbach, T. M. (1997). Covariation of the anxious-depressed syndrome during adolescence: Separating fact from artifact. *Journal of Consulting and Clinical Psychology*, 65, 6–14.
- Hinshaw, S. P. (1987). On the distinction between attentional deficits/hyperactivity and conduct problems/aggression in child psychopathology. *Psychological Bulletin*, 101, 443–463.
- Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, 30, 179–185.
- Jensen, P. S., Rubio-Stipec, M., Canino, G., Bird, H. R., Dulcan, M. K., Schwab-Stone, M. E., & Lahey, B. B. (1999). Parent and child contributions to diagnosis of mental disorder: Are both informants always necessary? *Journal of the American Academy of Child and Adolescent Psychiatry*, 38, 1569–1579.
- Joiner, T. E. (1997). Shyness and low social support as interactive diatheses, with loneliness as mediator: Testing an interpersonal-personality view of vulnerability to depressive symptoms. *Journal of Abnormal Psychology*, 106, 386–394.
- Kendler, K. S., Neale, M. C., Kessler, R. C., Heath, A. C., & Eaves, L. (1992). Major depression and generalized anxiety disorder: Same genes, (partly) different environments? *Archives of General Psychiatry*, 49, 716–722.
- Kendler, K. S., Prescott, C. A., Myers, J., & Neale, M. C. (2003). The structure of genetic and environmental risk factors for common psychiatric and substance use disorders in men and women. *Archives of General Psychiatry*, 60, 929–937.
- Kessler, R. C., Stang, P., Wittchen, H.-U., Stein, M., & Walters, E. E. (1999). Lifetime co-morbidities between social phobia and mood disorders in the U. S. National Comorbidity Survey. *Psychological Medicine*, 29, 555–567.
- Krueger, R. F. (1999). The structure of common mental disorders. *Archives of General Psychiatry*, 56, 921–926.
- Lahey, B. B. (2001). Commentary: Should the combined and predominantly inattentive types of ADHD be considered distinct and unrelated disorders? Not now, at least. *Clinical Psychology: Science and Practice*, 8, 494–497.
- Lahey, B. B., Applegate, B., Barkley, R. A., Garfinkel, B., McBurnett, K., Kerdyk, L., et al. (1994). *DSM-IV* field trials for oppositional defiant disorder and conduct disorder in children and adolescents. *American Journal of Psychiatry*, 151, 1163–1171.
- Lahey, B. B., Applegate, B., McBurnett, K., Biederman, J., Greenhill, L., Hynd, G. W., et al. (1994). *DSM-IV* field trials for attention deficit/hyperactivity disorder in children and adolescents. *American Journal of Psychiatry*, 151, 1673–1685.
- Lahey, B. B., Carlson, C. L., & Frick, P. J. (1997). Attention deficit disorder without hyperactivity. In A. Frances, T. Widiger, H. Pincus, R. Ross, M. B. First, & W. Davis (Eds.), *DSM-IV source book* (Vol. 3, pp. 163–188). Washington, DC: American Psychiatric Press.
- Lahey, B. B., Loeber, R., Quay, H. C., Frick, P. J., & Grimm, J. (1992). Oppositional defiant and conduct disorders: Issues to be resolved for *DSM-IV*. *Journal of the American Academy of Child and Adolescent Psychiatry*, 31, 539–546.
- Lahey, B. B., Loeber, R., Quay, H. C., Frick, P. J., & Grimm, J. (1997). Oppositional defiant disorder and conduct disorder. In A. Frances, T. Widiger, H. Pincus, R. Ross, M. B. First, & W. Davis (Eds.), *DSM-IV source book* (Vol. 3, pp. 189–209). Washington, DC: American Psychiatric Press.
- Lahey, B. B., Miller, T. L., Gordon, R. A., & Riley, A. (1999). Developmental epidemiology of the disruptive behavior disorders. In H. Quay & A. Hogan (Eds.), *Handbook of the disruptive behavior disorders*. (pp. 23–48). New York: Plenum.
- Lahey, B. B., Pelham, W. E., Stein, M. A., Loney, J., Trapani, C., Nugent, K., et al. (1998). Validity of *DSM-IV* attention-deficit/hyperactivity disorder for younger children. *Journal of the American Academy of Child and Adolescent Psychiatry*, 37, 695–702.
- Lahey, B. B., Stempniak, M., Robinson, E., & Tyroler, M. J. (1978). Hyperactivity and learning disabilities as independent dimensions of child behavior problems. *Journal of Abnormal Psychology*, 87, 330–340.
- Loeber, R., Green, S. M., Lahey, B. B., & Stouthamer-Loeber, M. (1989). Optimal informants on childhood disruptive behaviors. *Development and Psychopathology*, 1, 317–337.
- Loeber, R., Lahey, B. B., & Thomas, C. (1991). The diagnostic conundrum of oppositional defiant disorder and conduct disorder. *Journal of Abnormal Psychology*, 100, 379–390.
- Loney, J. (1987). Hyperactivity and aggression in the diagnosis of attention deficit disorder. In B. B. Lahey & A. E. Kazdin (Eds.), *Advances in clinical child psychology* (Vol. 10, pp. 99–136). New York: Plenum.
- March, J. S., Parker, J. D. A., Sullivan, K., Stallings, P., & Conners, C. K. (1997). The Multidimensional Anxiety Scale for Children (MASC): Factor structure, reliability, and validity. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 554–565.
- McBurnett, K., Pfiffner, L. J., & Frick, P. J. (2001). Symptom properties as a function of ADHD type: An argument for continued study of sluggish cognitive tempo. *Journal of Abnormal Child Psychology*, 29, 207–213.
- Merikangas, K. R., & Angst, J. (1995). Comorbidity and social phobia: Evidence from clinical, epidemiologic, and genetic studies. *European Archives of Psychiatry and Clinical Neuroscience*, 244, 297–303.
- Milich, R., Balentine, A. C., & Lynam, D. R. (2001). ADHD combined type and ADHD predominantly inattentive type are distinct and unrelated disorders. *Clinical Psychology: Science and Practice*, 8, 463–488.
- Mineka, S., Watson, D., & Clark, L. A. (1998). Comorbidity of anxiety and unipolar mood disorders. *Annual Review of Psychology*, 49, 377–412.
- Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, 100, 674–701.
- Molina, B., Smith, B., & Pelham, W. E. (2001). Factor structure and criterion validity of secondary school teacher ratings of ADHD and ODD. *Journal of Abnormal Child Psychology*, 29, 71–82.
- Nolen-Hoeksema, S. (2000). The role of rumination in depressive disorders and mixed anxiety/depressive symptoms. *Journal of Abnormal Psychology*, 109, 504–511.
- Nottelmann, E. D., & Jensen, P. S. (1995). Comorbidity of disorders in children and adolescents: Developmental perspectives. In T. H. Ollendick & R. J. Prinz (Eds.), *Advances in clinical child psychology* (Vol. 17, pp. 109–155). New York: Plenum.
- O'Connor, B. P. (2000). SPSS and SAS programs for determining the number of components using parallel analysis and Velicer's MAP test. *Behavior Research Methods, Instruments, and Computers*, 32, 396–402.
- Ollendick, T. H. (1983). Reliability and validity of the Revised Fear Survey Schedule for Children (FSSC-R). *Behaviour Research and Therapy*, 21, 685–692.
- Pelham, W. E., Gnagy, E. M., Greenslade, K. E., & Milich, R. (1992). Teacher ratings of *DSM-III-R* symptoms for the disruptive behavior disorders. *Journal of the American Academy of Child and Adolescent Psychiatry*, 31, 210–218.
- Pillow, D. R., Pelham, W. E., Hoza, B., Molina, B. S. G., & Stultz, C. H. (1998). Confirmatory factor analyses examining attention deficit hyperactivity disorder symptoms and other childhood disruptive behavior disorders. *Journal of Abnormal Child Psychology*, 26, 293–309.
- Quay, H. C. (1986). Classification. In H. C. Quay & J. S. Werry (Eds.), *Psychopathological disorders of childhood* (3rd ed.). New York: Wiley.
- Quay, H. C., & Peterson, D. R., (1982). *Revised Behavior Problems Checklist*. Miami, FL: University of Miami, Department of Psychology.
- Robinson, N. S., Garber, J., & Hilsman, R. (1995). Cognitions and stress: Direct and moderating effects on depressive versus externalizing symptoms during the junior high school transition. *Journal of Abnormal Psychology*, 104, 453–463.

- Rummel, R. J. (1970). *Applied factor analysis*. Evanston, IL: Northwestern University Press.
- Rutter, M. (1997). Comorbidity: Concepts, claims and choices. *Criminal Behaviour and Mental Health*, 7, 265–285.
- Schwab-Stone, M., Fallon, T., Briggs, M., & Crowther, B. (1994). Reliability of diagnostic reporting for children aged 6–11 years: A test–retest study of the Diagnostic Interview Schedule for Children—Revised. *American Journal of Psychiatry*, 151, 1048–1054.
- Shaffer, D., Fisher, P., Dulcan, M., Davies, M., Piacentini, J., Schwab-Stone, M., et al. (1996). The NIMH Diagnostic Interview Schedule for Children (DISC 2.3): Description, acceptability, prevalences, and performance in the MECA study. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35, 865–877.
- Silberg, J. L., Rutter, M., Meyer, J., Maes, H., Hewitt, J., Siminoff, E., et al. (1996). Genetic and environmental influences on the covariation between hyperactivity and conduct disturbance in juvenile twins. *Journal of Child Psychology and Psychiatry*, 37, 803–816.
- Spence, S. H. (1997). Structure of anxiety symptoms among children: A confirmatory factor-analytic study. *Journal of Abnormal Psychology*, 106, 280–297.
- Statin, H., Magnusson, D., Olah, A., Kassin, H., & Reddy, N. Y. (1991). Perception of threatening consequences of anxiety-provoking situations. *Anxiety Research*, 4, 141–166.
- Steiger, J. H. (1980). Tests for comparing elements of a correlation matrix. *Psychological Bulletin*, 87, 245–251.
- Tram, J., & Cole, D. A. (2000). Self-perceived competence and the relation between life events and depressive symptoms in adolescence: Mediator or moderator? *Journal of Abnormal Psychology*, 109, 753–760.
- Vollebergh, W. A. M., Iedema, J., Bijl, R. V., de Graaf, R., Smit, F., & Ormel, J. (2001). The structure and stability of common mental disorders: The NEMESIS Study. *Archives of General Psychiatry*, 58, 597–603.
- Wadsworth, M. E., Hudziak, J. J., Heath, A. C., & Achenbach, T. M. (2001). Latent class analysis of Child Behavior Checklist Anxiety/Depression in children and adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 40, 106–114.
- Waldman, I. D., Lilienfeld, S. O., & Lahey, B. B. (1995). Toward construct validity in the childhood disruptive behavior disorders: Classification and diagnosis in *DSM-IV* and beyond. In T. H. Ollendick & R. J. Prinz (Eds.), *Advances in clinical child psychology* (Vol. 17, pp. 323–363). New York: Plenum.
- Waldman, I. D., Rhee, S. H., Levy, F., & Hay, D. A. (2001). Genetic and environmental influences on the covariation among symptoms of attention deficit hyperactivity disorder, oppositional defiant disorder, and conduct disorder. In D. A. Hay & F. Levy (Eds.), *Attention, genes, and ADHD*. Hillsdale, NJ: Erlbaum.
- Weiss, B., & Garber, J. (2003). Developmental differences in the phenomenology of depression. *Development and Psychopathology*, 15, 403–430.
- World Health Organization. (1992). *International statistical classification of diseases and related health problems* (10th ed.). Geneva, Switzerland: Author.

## Appendix

### Composite Items (Top) and Items Eliminated Because of Low Prevalence of Ratings Above 0 (Bottom)

#### Composite Items Created by Taking the Highest Rating of Any of the Combined Items

- separation headaches/stomachaches =  
had headaches or stomach aches or felt like would throw up when couldn't be with [attachment figure]  
had headaches or stomachaches or felt sick before going to [school/work]
- need for attachment figure at bedtime =  
worried about spending the night away from home more than most other children  
wanted to have attachment figure nearby when went to sleep
- worried about loss of attachment figure =  
worried that something bad might happen to attachment figure  
worried that attachment figure might go away and never come back
- upset over separation =  
got upset or homesick when away from home  
got upset about attachment figure going out or begged attachment figure not to leave
- lying to con =  
tried to cheat people by selling or trading things that weren't what said to be  
lied to get money or something else, lied to avoid repaying a debt
- vandalism =  
broke or messed up things on purpose like breaking windows, writing on a building, or slashing tires  
broke or damaged other people's things on purpose
- use of a weapon =  
hurt people with weapons like a bat, brick, knife, or gun  
threatened people with weapons like a bat, brick, knife, or gun
- fatigue or loss of energy =  
sluggish and tired  
doing even little things made more tired than usual  
sluggish and not very energetic  
had less energy than usual
- theft without confrontation of the victim =  
stole things from stores when you thought no one was watching  
picked people's pockets  
forged checks or used other people's credit cards without permission  
stole things when nobody was looking, not counting taking things from stores
- theft with confrontation of the victim =  
snatched purses or jewelry  
held people up or attacked people to steal from them  
threatened people in order to steal from them
- selling drugs =  
sold marijuana or hashish  
sold cocaine, crack, heroin, or other hard drugs
- cruelty to others =  
tried to hurt someone in a cruel way when not in a fight  
tied people up and left them
- dislike or avoid paying attention =  
disliked doing things that required paying attention for a long time  
tried not to do things that required paying attention for a long time

interrupt or intrude on others =	hungrier or ate more than usual
butted in on what other people were doing	gained an unusual amount of weight
interrupted people when they were talking or busy	decreased appetite or weight =
difficulty remaining seated =	lost weight when not trying to lose weight
had a hard time staying in seat when supposed to be seated	lost appetite or felt less like eating than usual
felt restless when had to sit for more than ten minutes	sleepy during the day =
inattention to detail/careless mistakes =	slept more during the day than usual
made careless mistakes when doing schoolwork or work	sleepy or drowsy during the day.
had a hard time paying attention to details when doing schoolwork or work	difficulty thinking or deciding =
defied adult requests =	couldn't think as clearly or as fast as usual
refused to do what caretaker or teachers or boss told to do	harder than usual to make up mind or make decisions
did things on purpose that caretaker or teachers or boss told not to do	worried had made small mistake =
spitefulness and vindictiveness =	worried might have done something the wrong way
got even with people (not siblings) by hurting them, messing up their	worried when made small mistakes doing schoolwork or work
things, or telling lies about them	suicidal behavior <sup>A1</sup> =
did mean things on purpose to people, not counting siblings	thought seriously about killing self
increased appetite or weight =	had a plan for exactly how would kill self
	suicide attempt in last 12 months

#### Items Eliminated From the Exploratory Factor Analysis of Adult Caretaker Ratings Because of Less Than 3.0% Ratings Above 0

fire setting to cause harm	breaking and entering	afraid of cars, buses, or trains
joyriding	prostitution	had urge to do something bad in public
obscene telephone calls	sold marijuana or other drugs	suicidal behavior
ran away from home overnight	cheated on school tests	
forced sexual activity	hurt animals on purpose	
received or fenced stolen property	avoided paying for things	
theft with confrontation of the victim	made prank telephone calls	
physical cruelty to others	got kids to gang up on disliked kids	
used weapon		

#### Items Eliminated From the Exploratory Factor Analysis of Youth Self-Ratings Because of Less Than 3.0% Ratings Above 0

hurt animals on purpose	ran away from home overnight
breaking and entering	forced sexual activity
fire setting to cause harm	theft with confrontation of the victim
joyriding	sold marijuana or other drugs
prostitution	

<sup>A1</sup> Unlike other composite items, the sum of the three items referring to suicide, each scored 0 (*no*) and 1 (*yes*), was used as the score of the suicidal behavior item.

Received September 3, 2002  
Revision received December 11, 2003  
Accepted February 20, 2004 ■

### Wanted: Old APA Journals!

APA is continuing its efforts to digitize older journal issues for the PsycARTICLES database. Thanks to many generous donors, we have made great strides, but we still need many issues, particularly those published in the 1950s and earlier.

If you have a collection of older journals and are interested in making a donation, please e-mail [journals@apa.org](mailto:journals@apa.org) or visit <http://www.apa.org/journals/donations.html> for an up-to-date list of the issues we are seeking.