

Preadolescent Girls With Attention-Deficit/Hyperactivity Disorder: I. Background Characteristics, Comorbidity, Cognitive and Social Functioning, and Parenting Practices

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This study investigated a diverse sample of girls (6–12 years of age) with attention-deficit/hyperactivity disorder (ADHD), combined type ($n = 93$) and inattentive type ($n = 47$), plus age- and ethnicity-matched comparison girls ($n = 88$), who participated in research summer programs. Speech and language problems, grade retention, and adoption characterized the ADHD sample; documented abuse characterized the combined type. Girls with ADHD showed dysfunction in terms of externalizing and internalizing behaviors and comorbidities, cognitive and academic performance, authoritarian parenting, and peer status. The inattentive type was more socially isolated but less rejected by peers than the combined type. ADHD-related impairment was independent of age and disruptive comorbidity. Further examination of processes related to psychopathology and competencies in girls with ADHD is needed.

Despite a surge of interest in female manifestations of attention-deficit/hyperactivity disorder (ADHD) in the past decade (Arnold, 1996; Gaub & Carlson, 1997), the vast majority of research on this disorder has been performed with male samples. Such research has established that ADHD can be assessed reliably, that neurobiological risk factors are accentuated by parenting and school-related variables in shaping its symptomatology, and that children and adolescents with this disorder display severe impairments in important functional domains (e.g., Barkley, 1998; Hinshaw, 1999, in press; NIH Consensus Statement, 1998). Because ADHD is potentially underrecognized and underdiagnosed in girls (Biederman et al., 1999; Gaub & Carlson, 1997) and because of its public health significance, investigation of ADHD in girls and women is a priority.

The male predominance in extant research on ADHD is difficult to overstate. Several key samples, comprising a large percentage of published data in the field, are exclusively male (e.g., Biederman, Faraone, Keenan, Knee, & Tsuang, 1990; Gittelman, Mannuzza, Shenker, & Bonagura, 1985; Hinshaw, Zupan, Simmel, Nigg, & Melnick, 1997; Loney, Kramer, & Milich, 1981; Whalen & Henker, 1980). Furthermore, the majority of reports with mixed-sex samples have included too few girls for separate analysis of female manifestations and mechanisms. The two largest female samples

are relatively recent: (a) the 116 girls who participated in the Multimodal Treatment Study of Children with ADHD (MTA; MTA Cooperative Group, 1999) and (b) the 140 girls in the sample of Biederman et al. (1999). Each, however, presents issues regarding external validity. Three fourths of the MTA sample were intensively treated with medication, behavioral treatments, or both according to strict protocol for 14 months during middle childhood, and all displayed the combined type of ADHD. The Biederman et al. sample was exclusively Caucasian and middle- to upper-middle class; because it spanned the age range from 6 to 17 years at baseline, a significant subgroup had already progressed to adolescence during initial data collection. Overall, the number of girls in research on ADHD has been quite small, and recent samples of larger size are not fully generalizable.

Despite the limited database, what has been learned about girls with ADHD? Much pertinent research has focused on sex differences in manifestations of the disorder (Arnold, 1996), through direct comparisons of boys and girls who meet symptom criteria. The meta-analysis of Gaub and Carlson (1997) reviewed relevant evidence and revealed that clinic-referred girls with ADHD appear quite similar to boys with comparable background characteristics, rates of core symptoms, and degrees of impairment, whereas in the community at large, girls appear to display lower rates of the constituent behaviors as well as associated externalizing and internalizing behavior patterns (Gaub & Carlson, 1997). It thus appears that only girls with rather substantial impairments become referred, meaning that clinic samples may mask true sex differences in underlying behavioral characteristics.

Suggestive evidence also exists that girls with ADHD display higher rates of speech and language disorders and delays, as well as more compromised overall intellectual abilities, than do boys (Gaub & Carlson, 1997; James & Taylor, 1990). Yet small and nonrepresentative female samples compromise the viability of such conclusions, which have yielded modest effect sizes. In addition, although initial evidence suggested that girls with ADHD may display more familial loading (and presumably more genetic

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liability) than do boys (e.g., Kashani, Chapel, Ellis, & Shekim, 1979), recent evidence shows comparable rates of familial transmission (Faraone et al., 2000) and heritability (e.g., Gjone, Stevenson, & Sundet, 1996) between the sexes. It is also important, however, to document the features and impairments of girls with ADHD without an explicit focus on differences from boys. If such research is to span multiple domains of evaluation and to include objective measurement in addition to questionnaire scales, representative samples may not be feasible. Thus, research with large and well-characterized clinical and community samples can help to document processes and mechanisms related to symptomatology, impairment, and competence in girls with this disorder.

The most influential investigation in this regard is that of Biederman et al. (1999), whose Caucasian, socioeconomically advantaged, and biological-offspring sample, referred from pediatric and psychiatric sources, showed clear impairments in academic, social, and family domains relative to a well-matched comparison group. Rates of disruptive and internalizing comorbidity, a crucial topic for research on ADHD (Hinshaw, 1987; Jensen, Martin, & Cantwell, 1997), were far higher in the ADHD than in the comparison sample (although rates of disruptive comorbidity were lower than those typically found for boys with ADHD; see Gaub & Carlson, 1997). Substance use disorders were also more frequent in the girls with ADHD than in the comparison group, but only for those who had reached adolescence. Importantly, Biederman et al. (1999) did not find subtype differences across their measures of impairment and comorbidity: Combined vs. inattentive vs. hyperactive-impulsive (HI) subgroups (American Psychiatric Association, 1994) were statistically comparable for the outcomes examined. Yet almost no other work in the field has examined subtype issues in girls with any degree of statistical power. A key goal herein was to extend the effects found in Biederman et al. (1999) through use of measurement strategies like objective behavior observations and sociometric assessments and through use of constructs particularly suited to female samples (e.g., relational aggression, social isolation).

Overall, my key aim is to examine background characteristics, comorbidities, cognitive performance, patterns of social behavior and peer preference, and parenting practices in a socioeconomically and ethnically diverse sample of preadolescent girls with ADHD. I selected measures in accordance with the theoretical perspective that ADHD is a disorder with strong psychobiological underpinnings and with characteristic cognitive and verbal deficits (see Barkley, 1997; Tannock, 1998) but also one for which psychosocial influences (e.g., parenting, peer relations) are important, transactional contributors to symptomatology and impairment (see Hinshaw, 1999; Johnston & Mash, 2001). Measures were also selected for their established empirical support in differentiating ADHD from comparison children (chiefly boys) as well as their functional and developmental relevance (e.g., historical variables such as birth history and abuse history). In addition, I selected measures believed to be of particular pertinence to female development (e.g., relational aggression, social isolation). Because girls' patterns of social preferences and social groupings are far different from those of boys in childhood (Maccoby, 1998), a key aim was to observe the participants in all-female, naturalistic settings. Although not ascertained through representative sampling, the sample includes both clinic-referred girls and those without prior diagnosis or treatment; it also features an intensity of data collec-

tion not possible with representative samples. The database includes objective measures (cognitive tests, naturalistic behavior observations, peer sociometric nominations) in addition to standardized rating scales and interviews, enhancing its rigor. Furthermore, the sample includes both the combined and inattentive types of ADHD, a crucial feature because of the salience of the inattentive type for girls (Gaub & Carlson, 1997; Lahey et al., 1994). To preserve statistical power for this subtype comparison, and because the HI type may be more salient in preschoolers (Lahey et al., 1994), I did not include the HI type. To my knowledge, the current sample is the largest one in existence of preadolescent girls with ADHD. This work is intended to set the stage for additional investigations of processes and mechanisms relevant to ADHD and for prospective follow-up; such longitudinal data will be crucial for testing developmental, transactional hypotheses related to impairment and competence. For a companion report of the girls' neuropsychological status, see Hinshaw, Carte, Sami, Treuting, and Zupan (2002).

On the basis of core findings from the literature on boys with ADHD (e.g., Barkley, 1998) and pertinent theoretical conceptualizations (e.g., Hinshaw, 1994), I hypothesized the following. First, girls with ADHD would display impairments, relative to comparison girls, on cognitive and achievement measures as well as on indicators of peer status and show higher rates of other psychiatric disorders (Gaub & Carlson, 1997). Second, in keeping with interactive and transactional etiologic and risk models (Hinshaw, 1999), such background characteristics as adoption status and child abuse (Simmel, Brooks, Barth, & Hinshaw, 2001), as well as developmental factors like speech and language delay (Gaub & Carlson, 1997), would be more pronounced in the girls with ADHD. Third, parents of the ADHD sample would rate their parenting practices as more harsh and authoritarian and as less authoritative than parents of the comparison girls (Hinshaw, Zupan, et al., 1997; Johnston & Mash, 2001). Fourth, on the basis of the recent review of Milich, Balentine, and Lynam (2001), girls in the inattentive type (relative to the combined type) would show (a) lesser amounts of disruptive comorbidity and peer rejection (Gaub & Carlson, 1997), (b) histories of greater degrees of speech and language problems (James & Taylor, 1990), (c) lower general cognitive abilities (Biederman et al., 1999; Hinshaw, 1994), and (d) lower degrees of authoritarian parenting (Johnston & Mash, 2001).

Method

Overview of Procedure

My staff and I conducted summer research programs in 1997, 1998, and 1999, each containing girls with ADHD as well as comparison girls who participated together in a series of activities designed as a summer enrichment day camp. Following recruitment from multiple sources, we performed a multiple-gating procedure of screening and diagnostic assessment each winter and early spring, followed by thorough evaluation of comorbidities, impairments, and cognitive functioning in the late spring. Full informed consent was obtained during these precamp assessments. All evaluations were performed while any previously medicated girls with ADHD were not receiving stimulant medication. During the summer programs, which were located on the campus of a local school, we featured a series of classroom, art, drama, and outdoor activities that afforded collection of peer sociometric nominations, daily behavior ratings from

staff, and objective observation of naturalistic social interactions by trained observers. Classes of 25–26 girls (60% with ADHD, 40% comparison), grouped by age (6–8 years, 8.5–10.5 years, and 10.5–15.5 years), participated together for each day's events. Each activity featured a head teacher plus four to six counselors, who provided daily behavior ratings; all staff (including behavior observers) were unaware of diagnostic group status. We asked families of any girls with ADHD who had been receiving stimulant medication prior to the program to have their daughters participate while unmedicated. The majority did so; for the 27 girls whose families requested a medication trial, data herein reflect behavior patterns during unmedicated periods.

Participants

Girls with ADHD and comparison girls were recruited in parallel formats. For the ADHD sample, my staff and I sent mailings to medical settings (including health maintenance organizations, or HMOs), mental health centers, pediatric practices, and local school districts; we gave talks at self-help groups; and we placed advertisements in local newspapers. For the comparison girls, we sent similar mailings to school districts and community centers in the San Francisco Bay Area; we also placed identical or parallel advertisements in the same local newspapers (in the parallel ads, wording emphasized "summer enrichment programs" rather than "summer enrichment programs for girls with attentional problems"). The wide range of referral sources and the heterogeneity of the San Francisco Bay Area ensured that the sample was diverse ethnically (53% Caucasian, 27% African American, 11% Latina, 9% Asian American) and socioeconomically (families from highest strata to those receiving public assistance). For the ADHD and comparison girls, the age range was 6–12 years. Overall exclusionary criteria included IQ less than 70; overt neurological damage, psychosis, or pervasive developmental disorder; and medical conditions precluding participation in a summer camp.

At the first gate, interested families contacted the project by phone. Approximately a third of the approximately 1,200 initial callers across the 3 years of recruitment made inquiries about programs for children outside our age range or for boys. My staff and I mailed program descriptions to the remaining families. Following the mailing, still-interested families called to schedule phone intakes ($n = 709$). For the second gate, we mailed packets of questionnaires to eligible families, one set for parents and another for the child's primary teacher. We received completed forms back from 63% (450/709). Participants with ADHD had to show (a) Swanson, Nolan, and Pelham (SNAP-IV) Parent Inattention and Teacher Inattention Scales (Swanson, 1992) endorsed with at least five of nine items positive (i.e., at a level of 2 [*pretty much*] or 3 [*very much*] on the 0–3 metric), with Parent and Teacher Hyperactivity/Impulsivity Scales ranging from 0 to 9 items positive and (b) Child Behavior Checklist (CBCL) and Teacher Report Form (TRF) Attention Problem scores (Achenbach, 1991) of at least $T = 60$, a cutoff validated by Chen, Faraone, Biederman, and Tsuang (1994). For girls receiving medication, parents and teachers were asked to rate unmedicated behavior patterns. All parents did so, but 35% of teachers had seen girls exclusively on medication, as determined by a question on the cover sheet of the scales; for these cases, we used parental information only. (Chen et al., 1994, report high validity for parent ratings in terms of diagnosing ADHD.) These cutoffs (5 SNAP-IV symptoms; $CBCL > 60$) were intentionally set low in order not to eliminate potentially eligible girls on the basis of initial rating scales. For comparison girls, scores had to be below these cutoffs. Of the completed packets, 62% (278/450) met screening criteria for either ADHD or comparison status. These families were invited for diagnostic assessments; ineligible families were referred out.

At the diagnostic evaluations, after completing consent and assent forms, parents were administered the Diagnostic Interview Schedule for Children (4th ed.; DISC-IV; Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000), and girls were assessed for general intelligence with the Wechsler

Intelligence Scale for Children (3rd ed.; WISC-III; Wechsler, 1991). The DISC-IV and WISC-III were administered by highly trained graduate students, at the bachelor's or master's level, who were unaware of putative diagnostic status. As noted above, previously medicated girls were unmedicated for these sessions, and parents responded to DISC-IV questions with regard to their daughter's unmedicated behavior. I note that asking parents about unmedicated behavior patterns for ascertaining diagnostic status is necessary for evaluating families of children who are medicated, given the strong influence of stimulant medications on the core behaviors of ADHD (Greenhill & Osman, 2000); this procedure was performed in the MTA study as well (Hinshaw, March, et al., 1997). For final eligibility in the ADHD group, the girl had to meet full criteria for ADHD (either combined or inattentive type) on the DISC-IV and parent SNAP-IV ratings (note that the DISC-IV algorithm includes duration and impairment criteria in its algorithms; Shaffer et al., 2000). Eligibility for the comparison group required a negative regarding the DISC-IV diagnosis of ADHD. Of families attending this gate (6 of the 278 did not show up), 90% (245/272) met full criteria and were accepted into the program. Seventeen of these 245 declined the program or encountered space limitations; the final sample included 140 girls with ADHD and 88 comparison girls.

To promote generalizability of the ADHD sample, I did not exclude common comorbidities (disruptive behavior disorders, anxiety disorders, depression). Although comparison girls could not meet criteria for ADHD, because I did not wish to constitute a supernormal comparison sample I did not exclude oppositional defiant disorder (ODD) or internalizing disorders (Kendler, 1990). In addition, comparison girls may have displayed some of the constituent behaviors of ADHD but could not show either above-threshold symptomatology or above-threshold impairment.

In terms of ADHD subtypes, because the HI subtype may be particularly relevant for preschool-age children (Lahey et al., 1994) and because of our desire to have maximum statistical power for inattentive- versus combined-type contrasts, I excluded girls meeting criteria for the HI type a priori. Second, to diagnose combined vs. inattentive subtypes, I initially used the following formula: If the DISC-IV HI symptom count was six or more (American Psychiatric Association, 1994) and the SNAP-IV parent HI symptom count was six or more, the girl was designated as combined; otherwise, she was designated as inattentive. Yet because the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; DSM-IV; American Psychiatric Association, 1994) criteria present some difficulties for subtype designation (McBurnett, Pfiffner, & Frick, 2001)—that is, a child with at least six inattentive items plus five HI symptoms is designated as inattentive, the same as an inattentive child with zero HI symptoms—I reexamined girls ($n = 28$) for whom DISC-IV HI symptom counts were at levels of four, five, or six and parent SNAP-IV symptom counts were also at levels of four, five, or six. For these cases, four senior staff examined diagnostic materials following the summer program and made a clinical judgment as to combined versus inattentive types. In 46% of these cases ($n = 13$), the judgments were identical to those from the DSM-IV algorithm; for the remaining 54% ($n = 15$), the consensus judgment reversed the algorithm. Overall, given the consensus judgment, 93 of the 140 girls with ADHD were designated as combined and 47 as inattentive. Note, however, that when I recondensed all primary analyses reported herein using the strict DSM-IV algorithm, only 2 out of 52 omnibus analyses changed in significance level, each from significant to marginally significant, and only 5 of 156 subgroup contrasts changed in significance level, with effect sizes virtually identical. Thus, I present data herein for the consensus subgroup designations.

Measures

Demographic and Background/Risk Factor Information

Primary parents (usually the mother) completed a detailed questionnaire, adapted from the MTA Study (Hinshaw, March, et al., 1997), yielding information on demographics and historical information. Single questions

inquired about the following demographic variables: child's age, family annual gross income, highest level of maternal education, family's receipt of any form of public assistance, child's ethnicity, and single- versus two-parent household. Other questions pertained to history of special education placements or grade retention, speech and language delays or problems, adoption, and birthweight. To ascertain whether the girl had ever experienced physical or sexual abuse, trained coders (unaware of diagnostic status) reviewed a file for each participant, which contained all intake and diagnostic information; this procedure was followed by a blinded review by senior staff (see Briscoe & Hinshaw, 2002, for details). As a result, only cases of officially documented (with Child Protective Services reports) or strongly suspected abuse (i.e., cases in which families stated that prior reports had been made or that abuse definitely occurred) were counted.

Comorbid Diagnoses

I generated categorical child psychiatric diagnoses from the parent DISC-IV (Shaffer et al., 2000), scoring diagnoses in terms of "current" presence (which, for the DISC-IV, includes the time period from 12 months before the interview until the present). Although we administered the child version of the DISC-IV to girls over age 8, I use only data from the parent DISC-IV herein. In keeping with DSM-IV designations diagnoses of ODD and conduct disorder (CD) were grouped as disruptive behavior disorders; one or more of the following—social phobia, agoraphobia, panic disorder, separation anxiety disorder, generalized anxiety disorder, post traumatic stress disorder, or obsessive compulsive disorder—were grouped as anxiety disorders (in order not to spuriously inflate this category, I did not count specific phobias); and major depressive disorder or dysthymic disorder were counted as mood disorders.

Finally, I made the designation of reading disordered on the basis of standard scores below 85 on the Reading Recognition subtest of the Wechsler Individual Achievement Test (WIAT; Wechsler, 1992). Hinshaw et al. (2002) present rationale for using an absolute cutoff with respect to reading rather than an IQ versus reading discrepancy score (see Lyon, 1996).

Externalizing Behavior Patterns

I evaluated dimensionalized, externalizing behavior patterns of the participants through parent report, staff report, and objective observations from the summer program; such multimethod/multi-informant procedures are necessary to obtain complete information on childhood problem behavior.

CBCL. This extensively used scale, completed by parents, comprises eight narrowband factors; I feature Attention Problems herein. I also examine the broadband Externalizing dimension, which is a composite of the narrowband Aggressive Behavior and Delinquent Behavior scales. All CBCL scales have excellent internal consistency and test-retest reliability as well as validity, with the latter evidenced through extensive research on their associations with alternative measures of child psychopathology (e.g., Achenbach, 1991). Each of the 113 constituent CBCL items is rated on a 0–2 metric. I utilized T scores in all analyses.

SNAP-IV. This parent scale includes a dimensionalized checklist of the nine DSM-IV items for ADHD inattention, the nine items for ADHD-HI and the eight items for ODD, with each scored on a 4-point 0 (*not at all*) to 3 (*very much*) metric. The SNAP-IV is extensively used for the screening of ADHD—for example, it was a primary scale in the MTA Study (Hinshaw, March et al., 1997), with acceptable to excellent internal consistency, test-retest reliability, and validity statistics (Swanson, 1992). Indeed, like other, similar DSM-IV-derived dimensional measures of ADHD symptoms (e.g., DuPaul, Power, McGoey, Ikeda, & Anastopoulos, 1998; Weiler et al., 2000), the SNAP-IV corresponds quite well with categorical, diagnostic measures of this category (e.g., Hinshaw, March, et

al., 1997), with the added advantage of yielding continuously scaled scores pertinent to core ADHD and ODD symptomatology.

Daily Behavior Rating Scale (DBR). The large numbers of counselor and research assistant staff who interacted with the participants rated the group of girls with whom they had worked on a given day with one of three different rating scales (Externalizing Behavior, Internalizing Behavior, or Peer-Related Behavior). These counselors were advanced undergraduates or bachelor's-level staff in psychology or education, who had received full training in child management skills; as noted above, they were unaware of diagnostic group status. The data presented herein reflect an average of 3–4 ratings per child per day, amalgamated across the entire summer and reflecting only unmedicated days for ADHD participants receiving medication trials. Interrater reliability figures are somewhat problematic, as different counselors were grouped together on different days. When we were able to calculate reliabilities, however, interrater correlations averaged above $r = .5$.

Each of the 16 items composing the externalizing DBR was scored on a 4-point 0 (*never happened*) to 3 (*high frequency or high intensity*) metric. We analyzed the following subscales: (a) Overt Aggression: This four-item subscale tapped physical and verbal aggression: "swore at or verbally attacked adults (or peers)," and "hit, kicked, bit, or physically threatened adults (or peers)" ($\alpha = .81$). (b) Covert Antisocial Behavior, containing two items: "lied, cheated" and "took others' items or destroyed property" ($\alpha = .59$). In addition, I analyzed a five-item subscale from the peer relations DBR, entitled Relational Aggression, with items derived from Crick and Grotpeter (1995): "excluded peer from playgroup or activity," "spread rumors or told lies about peers," and "tried to get other children to stop playing with or stop liking peer" ($\alpha = .81$). All DBR scales show moderately strong correlations with parent completed ratings or diagnostic interviews and with objective measures of externalizing behaviors, attesting to their validity and to their partial independence from such alternate measures, as revealed in unpublished data from my laboratory.

Behavior observations. To obtain objective observations of social behavior in our large-group, naturalistic activities, I used the time-sampling procedures from previous research programs for boys with ADHD (Hinshaw, Simmel, & Heller, 1995; Hinshaw, Zupan, et al., 1997; coding manual available from author). Teams of four trained observers coded 1-hr classroom and playground periods (of approximately 25 girls in each group) across the summer. Linked by headphones that gave a series of intervals each comprising 3-s find, 5-s observe, and 3-s record cues, observers progressed down randomized lists of the participants, checking off for each interval one of six categories of social behavior and then proceeding to the next child. In this way, all children were observed multiple times per period, enhancing density of observations. The relevant externalizing codes were (a) noncompliance: defiant, rule-breaking behavior that fell short of physical or verbal aggression and (b) physical or verbal aggression: threatening, hitting, kicking, spitting at, or taunting, swearing at, or verbally threatening a peer or adult. Approximately 17% of the time, a given pair of observers observed the same roster of children simultaneously, affording appraisal of interobserver agreement. Although base rates of externalizing behaviors, particularly aggression, were low, agreement percentages were acceptable: noncompliance = .70; physical/verbal aggression = .60.

Internalizing Behavior Patterns

CBCL. I used the broadband Parent Internalizing scale (T score), composed of the narrowband Withdrawn Behavior, Somatic Concerns, and Anxiety/Depression scales.

Child Depression Inventory (CDI; Kovacs, 1992). This is a widely used self-report instrument tapping symptoms of depression in youth. Its psychometric properties compare favorably with those from other instruments in the field, with internal consistency ranging from .71–.87 and with test-retest reliability figures averaging .7 (Kovacs, 1992). In the present

sample, the alpha coefficient was .84. Each of the 27 items is scored on a 0–2 metric.

Multidimensional Anxiety Scale for Children (MASC; March, 1998). This is a rigorously standardized self-report instrument designed to tap several subfacets of anxiety in children and adolescents. Its reliability is satisfactory to excellent (with 3-week to 3-month test–retest intraclass correlations ranging from .78–.93), and construct validity is high (March, Parker, Sullivan, Stallings, & Conners, 1997). In the present sample, the alpha coefficient was .88. I used the total score.

DBR. For internalizing behaviors, I analyzed two subscales from the internalizing DBR, for which all items were scored on a 5-point metric (0 = *not at all*; 4 = *very much*): (a) Anxiety/Depression, composed of nine items such as “appeared sad, down, or depressed,” “self-critical,” and “nervous, anxious, fearful” ($\alpha = .83$) and (b) Withdrawn, composed of 4 items: “socially withdrawn,” “hesitant in social interactions,” “shy or quiet,” and “tended to cling to staff” ($\alpha = .70$).

Behavior observations. The relevant category from the behavior observation system described earlier is termed *social isolation*. Observers scored this category when the girl wandered from the activity, stayed on its periphery, or was disengaged from the rest of the group. Despite marginal interobserver agreement for this live observational code (.5), I retained this variable measure to have an objective, observational measure of internalizing behavior.

Peer Sociometric Status

As described in Hinshaw and Melnick (1995) for our prior male samples and in Blachman and Hinshaw (in press) for the present sample, I obtained individual, confidential peer sociometric nominations from each participant at the end of Week 1, Week 3, and Week 5 of each summer program. Using a picture board composed of head-and-shoulders photographs of all classmates, each girl nominated three girls (a) whom she most liked and (b) whom she most disliked. I analyzed the proportion of classmates who liked (positive nominations) and disliked (negative nominations) each participant. The stability of our peer nominations was strong (e.g., Week 1–Week 5 correlation for positive nominations: $r[226] = .51, p < .01$; for negative nominations: $r[226] = .85, p < .01$). Because of the atypical ratio of participants with ADHD to comparison participants at our summer programs, it could be argued that, if girls with ADHD have different social perceptions than the comparison girls, the sociometric measures could be biased. Yet the positive and negative nominations given by the clinical versus comparison samples were similar overall: Girls with ADHD were universally rejected, but girls with ADHD were somewhat more likely to show leniency towards other girls with ADHD, rating them slightly more positively and less negatively than did comparison girls (Blachman & Hinshaw, in press). (Analyses separated by ADHD versus comparison source of sociometric nominations yield findings identical to those reported herein.) Indeed, if anything, the atypical ratio of ADHD to comparison girls may understate the degree of social rejection experienced by the girls with ADHD.

Intelligence and Achievement Tests

WISC–III. The WISC–III is the most widely used measure of general cognitive abilities for children and adolescents, possessing excellent psychometric properties. Trained graduate students administered the full WISC–III, except for the Mazes supplemental subtest, to all participants. Following Kaufman (1994), we calculated the factor scores for Verbal Comprehension, Perceptual Organization, Freedom from Distractibility, and Processing Speed.

WIAT. We administered the Basic Reading (comprising reading recognition) and Math Reasoning subtests of the WIAT. Normed on the same sample as the WISC–III, the WIAT is a psychometrically sound, widely used test of academic achievement. Test–retest reliabilities for the Reading and Math scores range from .85–.92 (Wechsler, 1992).

Parenting Practices

Parent self-report of parenting practices and beliefs was measured with two empirically established scales. First, I used the Alabama Parenting Questionnaire (Shelton, Frick, & Wootton, 1996), with the five rationally and empirically derived subscales from Shelton et al.: (a) Involvement (10 items), measuring positive activities between parent and child (in our sample, $\alpha = .75$); (b) Positive Parenting (6 items), tapping parental use of praise and rewards ($\alpha = .83$); (c) Poor Monitoring/Supervision (10 items), measuring lack of parental tracking of the child ($\alpha = .72$); (d) Inconsistent Discipline (6 items), covering lack of parental follow through on contingencies ($\alpha = .73$); and (e) Corporal Punishment (3 items), comprising spanking, slapping, and hitting of the child ($\alpha = .62$). Except for the moderately strong association between Positive Parenting and Involvement ($r = .59$), none of the other nine intercorrelations between Alabama scales was greater than $r = .25$, signifying their relative independence. Second, I used Ideas About Parenting (IAP; Heming, Cowan, & Cowan, 1990). A prior factor analysis of this self-report measure with boys revealed three clear factors: Authoritarian, Authoritative, and Permissive (Hinshaw, Zupan et al., 1997). Because I could not assume factorial invariance among families of girls with ADHD, I submitted the 70 items to a principal-components analysis with varimax rotations. Although parenting factors of Authoritarian (17 items with loadings $> .30, \alpha = .76$) and Authoritative (15 items, $\alpha = .73$) emerged, the third factor was composed of items signifying doubts about parenting and a sense of incompetence in the parenting role (e.g., “Taking care of a child is much more work than pleasure,” “I control my child by warning about the bad things that can happen to him or her,” “I feel confident that I know the right way to bring up my children”—negative loading). I termed it Overwhelmed/Unsure (10 items, $\alpha = .55$). None of the scale intercorrelations was greater than $r = .11$.

Data Analyses

All statistical analyses were performed with SPSS for Windows, Version 10 (SPSS, Inc., 1999). Because of the large number of dependent measures, I first performed multivariate analyses of variance (MANOVAs) for all of the variables within a given domain, with the nine domains defined as demographic measures, background/risk variables, ADHD symptomatology, comorbidities, externalizing behavior, internalizing behavior, peer sociometrics, cognitive variables, and parenting scales. The independent variable for these analyses was diagnostic subgroup, comprising the three levels of ADHD combined, ADHD inattentive, and comparison. A significant MANOVA afforded the interpretation of follow-up univariate patterns of subgroup differences, examined with analyses of variance (ANOVAs) for each measure plus Tukey’s post hoc comparisons of each subgroup contrast. I used a conservative alpha level of .01 for the MANOVAs and ANOVAs. For interpretation, I emphasize effect sizes, calculated as Cohen’s d , with the difference between subtype means as the numerator and the pooled standard deviation as the denominator. Following Cohen (1988), .2 is considered a small effect, .5 a medium effect, and .8 a large effect. For categorical variables, which were confined to some demographic measures and background characteristics as well as rates of comorbidity, I performed univariate tests with 3 (subgroup) \times 2 (category present vs. absent) contingency tables, evaluating significance via chi-square tests and decomposing significant findings into a series of three different 2 \times 2 chi-square tests for the specific subgroup comparisons. For these, I calculated effect sizes as odds ratios.

It is possible that ADHD subtype effects could be confounded with differential rates of comorbidity with disruptive behavior disorders (e.g., Hinshaw, 1987). I therefore supplemented the primary analyses with multivariate analyses of covariance (MANCOVAs) for domains with significant MANOVA results, controlling for ODD/CD comorbidity. In addition, because of the 6–12 year age range of the sample, I also performed MANCOVAs with statistical control of the girls’ age for each domain with

significant subgroup MANOVA findings. I note, however, that age was weakly correlated with nearly all dependent measures. In fact, the only measures with which age was associated at levels greater than $r = .2$ were the MASC ($r = -.23$), WISC-III Processing Speed ($r = -.25$), and the Alabama Parenting Questionnaire Poor Monitoring scale ($r = .27$)

Because cohort effects could complicate interpretation of findings, I performed an initial set of analyses with the independent variable of cohort (year of participation: 1997, 1998, 1999). Across the 52 dependent measures (see tables), only five revealed significant effects. There was a greater percentage of two-parent families in 1997 than in the other summers (80% vs. 61%–69%); the proportion of cases with anxiety disorders was lower in 1997 than in the other summers (8% vs. 22%–24%); rates of observed physical and verbal aggression were higher in 1997 than in 1998 or 1999 (.011 vs. .004 and .005); rates of observed noncompliance were higher in 1997 and 1998 (.13 and .09) than in 1999 (.05); and observed social isolation was more frequent in 1999 (.037) than the other two summers (.021 and .022). Because of the low proportion of significant effects and their small effect sizes, I combined data from all three cohorts for the subsequent analyses.

Results

Demographic and Background Variables, ADHD Symptoms, and Comorbidity

Table 1 presents data on demographic variables, background/risk variables, ADHD-related symptomatology, and rates of comorbid diagnoses across the three diagnostic subgroups. The first MANOVA, for the domain of demographic variables, was non-significant, Pillai's trace = 0.067, $F(12, 424) = 1.23, p > .05$. For descriptive purposes, however, I present the individual ANOVAs for the demographic variables shown in Table 1. Subgroups did not differ significantly with respect to age, family income, maternal education, ethnicity, receipt of public assistance, or single- versus two-parent status; all effect sizes were small. Thus, the subgroups were statistically comparable regarding these variables.

Second, in the domain of background variables, the MANOVA was highly significant, Pillai's trace = 0.227, $F(12, 378) = 4.04, p < .01$. Five of six univariate tests were significant, with the

Table 1
Demographic and Background Variables, ADHD Symptomatology, and Comorbid Conditions by Diagnostic Subgroup

Variable	A. Combined (<i>n</i> = 93)		B. Inattentive (<i>n</i> = 47)		C. Comparison (<i>n</i> = 88)		<i>p</i> ^a	Type	Effect size ^b			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			A-B	A-C	B-C	
Demographic												
Age (months)	114.4	20.2	118.0	20.2	113.2	19.8	<i>ns</i>	<i>d</i>	-0.18	0.06	0.24	
Total annual family income ^c	6.1	2.6	6.3	2.8	6.7	2.5	<i>ns</i>	<i>d</i>	0.09	0.24	0.15	
Maternal education ^d	4.7	1.0	4.7	1.0	4.9	1.0	<i>ns</i>	<i>d</i>	0.00	0.23	0.23	
Caucasian (%)	55.9		57.4		46.6		<i>ns</i>	OR	0.94	1.45	1.55	
Public assistance (%)	15.1		14.9		11.4		<i>ns</i>	OR	1.01	1.38	1.37	
Two-parent household (%)	64.5		68.1		77.3		<i>ns</i>	OR	0.85	0.54	0.63	
Background and treatment-related (%)												
Low birthweight (<2,500 g)	12.2		7.1		10.7		<i>ns</i>	OR	1.80	1.16	0.64	
History of special education	19.8 _a		20.5 _a		3.5 _b		<.01	OR	0.67	4.47	6.71	
History of grade retention	14.1 _a		23.4 _a		3.4 _b		<.01	OR	0.54	4.61	8.56	
Speech/language problems	25.6 _a		29.8 _a		7.0 _b		.01	OR	0.81	4.58	5.65	
Adopted	20.4 _a		23.4 _a		4.5 _b		<.01	OR	0.84	5.39	6.42	
Abuse history	18.3 _a		6.4 _{a,b}		4.5 _b		<.01	OR	3.28	4.70	1.43	
ADHD-related symptoms												
Mom CBCL Attention Problem T score	74.8 _a	8.7	74.0 _a	9.1	52.2 _b	4.6	<.01	<i>d</i>	0.06	1.71	1.65	
Mom SNAP-IV Inattention (0-9)	7.5 _a	2.1	7.7 _a	1.5	0.4 _b	0.9	<.01	<i>d</i>	-0.05	1.85	1.90	
Mom SNAP-IV HI (0-9)	6.7 _a	2.3	3.0 _b	2.2	0.2 _c	0.6	<.01	<i>d</i>	1.08	1.90	0.82	
Teacher SNAP-IV Inattention (0-9) ^e	6.8 _a	2.0	6.3 _a	2.4	0.3 _b	1.0	<.01	<i>d</i>	0.14	1.81	1.67	
Teacher SNAP-IV HI (0-9) ^e	5.1 _a	2.5	2.0 _b	2.2	0.1 _c	0.5	<.01	<i>d</i>	1.09	1.73	0.64	
Comorbidities (%)												
DISC-IV ODD	71.0 _a		46.8 _b		6.8 _c		<.01	OR	2.74	32.9	12.0	
DISC-IV CD	26.9 _a		10.6 _b		0.0 _b		<.01	OR	2.96			
DISC-IV anxiety disorder	31.1 _a		19.1 _a		3.4 _b		<.01	OR	1.91	12.8	6.71	
DISC-IV depression/dysthymia	10.3 _a		4.3 _{a,b}		0.0 _b		<.01	OR	2.28			
Reading disorder	11.1		14.9		4.5		<i>ns</i>	OR	0.71	2.63	3.68	

Note. ADHD = attention-deficit/hyperactivity disorder; OR = odds ratio; CBCL = Child Behavior Checklist; SNAP-IV = Swanson, Nolan, and Pelham Rating Scale; HI = Hyperactivity/Impulsivity; DISC-IV = Diagnostic Interview Schedule for Children—4.0—Parent Report; ODD = oppositional defiant disorder; CD = conduct disorder.

^a Significance: one-way analysis for continuous variables; Pearson's chi-square statistic for categorical variables. In rows with significant omnibus tests, entries with different subscripts differ significantly on the basis of Tukey's post hoc comparisons or 2×2 chi-square tests. ^b Effect size (ES) type: Cohen's *d* for continuous variables, reflecting contrast of first-lettered subgroup versus second-lettered subgroup, with positive value of ES reflecting greater deviance in the first subgroup (e.g., higher symptom scores, lower cognitive scores); OR for categorical variables, with values > 1 reflecting greater deviance in the first subgroup (e.g., higher proportion of diagnoses). For subgroups with zero percentages, no OR can be calculated. ^c For total annual family income, 1 ≤ \$10,000; 9 ≥ \$75,000. ^d For maternal education, 1 = less than 8th grade; 6 = advanced or professional degree. ^e *n* = 54 for combined and 37 for inattentive types, because some teacher scales were invalid if teacher could rate only medicated behavior.

exception of low birthweight status (see Table 1). Both ADHD subgroups manifested, at levels far above those of the comparison sample, histories of special education placements, grade retention, and parent-reported histories of speech and language delays and problems. Counter to prediction, the inattentive type was not more likely to reveal a history of speech and language problems; both ADHD subtypes revealed rates between 25% and 30% for this variable. Adoption was present in one fifth to one fourth of the ADHD subgroups, rates that were well above that for the comparison sample but that did not differ significantly between the subtypes. Histories of physical or sexual abuse characterized the combined type, with an 18.3% rate, well above the inattentive type and the comparison group, which did not differ. The odds ratios for each of these significant contrasts were substantial. Subgroup effects maintained strong significance with control of the covariates of ODD/CD comorbidity and age.

Third, in the domain of ADHD-related symptomatology, the MANOVA was, as expected, highly significant, Pillai's trace = 1.24; $F(6, 448) = 121.54, p < .01$. (Because of reduced sample size for teacher ratings, related to the fact that 35% of teachers could rate only medicated behavior, I did not include the teacher ratings in the MANOVAs.) All univariate ANOVAs were significant, with contrasts indicating that girls in the combined and inattentive types were statistically equivalent, with both far above comparison girls, in terms of inattention (CBCL Attention Problem and SNAP-IV Inattention), whereas HI symptoms characterized only the combined type. Effects of subgroup remained highly significant with control of both comorbid ODD/CD and age.

Fourth, in the domain of comorbid diagnoses, the MANOVA was significant, Pillai's trace = 0.39, $F(10, 424) = 10.15, p < .01$. All four ANOVAs regarding psychiatric diagnosis clusters were significant. Participants with ADHD, combined type, displayed higher rates of ODD and CD than did those with the inattentive type; rates in comparison girls were extremely low. Note that the frequencies of these disruptive behavior disorders were substantial in both ADHD subgroups, a point discussed subsequently. Rates of anxiety disorders and mood disorders were lower overall, but they were elevated in the ADHD relative to the comparison girls. The ADHD subtypes were not, however, statistically distinguishable. Rates of reading disorder did not differ across the diagnostic groups. Age did not exert a significant effect on the comorbid diagnoses; each subgroup ANOVA maintained significance with its control.

Externalizing and Internalizing Behavior Patterns and Peer Status

First, in the domain of dimensional indicators of externalizing behavior, the MANOVA was highly significant, Pillai's trace = 0.689, $F(14, 438) = 16.46, p < .01$. Furthermore, all of the univariate ANOVAs yielded significant effects (see Table 2). The combined type scored far higher than both the inattentive type and the comparison group across all pertinent measures, with large to extremely large effect sizes. These effects were found not just for parent ratings, which could reflect parental bias or negative halo effects, but for the ratings made by staff who were unaware of

Table 2

Externalizing and Internalizing Behavior Patterns and Peer Sociometric Nominations by Diagnostic Subgroup

Variable	A. Combined (<i>n</i> = 93)		B. Inattentive (<i>n</i> = 47)		C. Comparison (<i>n</i> = 88)		<i>p</i> ^a	Effect size ^b		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		A-B	A-C	B-C
Externalizing/disruptive behaviors										
Mom CBCL Externalizing T score	68.7 _a	8.2	58.6 _b	11.0	45.9 _c	8.2	<.01	0.75	1.69	0.94
Mom SNAP-IV ODD Scale (0-8)	4.6 _a	2.5	2.3 _b	2.6	0.3 _c	1.0	<.01	0.80	1.52	0.72
Teacher SNAP-IV ODD Scale (0-8) ^c	3.9	2.9	1.6	2.3	0.03	0.2	<.01	0.90	1.51	0.61
DBR Overt Aggression (4 items)	0.71 _a	0.94	0.18 _b	0.38	0.05 _b	0.07	<.01	0.77	0.96	0.19
DBR Covert Behavior (2 items)	0.34 _a	0.38	0.09 _b	0.16	0.04 _b	0.06	<.01	0.86	1.03	0.17
DBR Relational Aggression (5 items)	1.14 _a	0.77	0.45 _b	0.44	0.22 _b	0.26	<.01	0.99	1.31	0.33
Observed noncompliance (proportion)	.145 _a	.095	.072 _b	.056	.042 _c	.038	<.01	0.87	1.23	0.36
Observed aggression (proportion)	.013 _a	.017	.005 _b	.012	.002 _b	.005	<.01	0.62	0.85	0.23
Internalizing behaviors										
CBCL Internalizing T score	60.8 _a	10.3	60.2 _a	10.2	47.4 _b	11.2	<.01	0.05	1.08	1.03
CDI (raw score: 0-54)	8.9 _a	6.7	8.9 _a	5.9	4.6 _b	4.8	<.01	0.01	0.70	0.69
MASC T score	54.5	18.6	52.6	16.4	51.0	15.7	<i>ns</i>	0.11	0.21	0.09
DBR withdrawn (4 items)	1.52	1.11	2.06	1.31	1.50	1.22	<i>ns</i>	-0.45	0.02	0.46
DBR Anxiety/Depression (9 items)	3.85 _a	2.78	2.76 _b	1.58	1.36 _c	1.03	<.01	0.47	1.08	0.61
Observed social isolation (proportion)	.024 _a	.020	.038 _b	.036	.023 _a	.027	<.01	0.52	0.04	0.56
Sociometric nomination proportions										
Positive nominations	.100 _a	.096	.104 _a	.083	.161 _b	.098	<.01	0.03	0.61	0.58
Negative nominations	.220 _a	.223	.103 _b	.108	.028 _c	.047	<.01	0.67	1.10	0.43

Note. Observed proportions = category frequency divided by all recorded social behavior categories. Sociometric nomination proportions = number of positive or negative nominations received, divided by number of peers providing nominations. CBCL = Child Behavior Checklist; SNAP-IV = Swanson, Nolan, and Pelham Rating Scale; ODD = oppositional defiant disorder; DBR = Daily Behavior Ratings; CDI = Children's Depression Inventory; MASC = Multidimensional Anxiety Scale for Children.

^a Level of significance from one-way analysis of variance. Means with different subscripts in a given row differ significantly on the basis of Tukey's post hoc comparisons. ^b Effect size (ES) is Cohen's *d*, reflecting contrast of first-lettered subgroup versus second-lettered subgroup, with positive value of ES reflecting greater deviance in the first subgroup (e.g., greater proportion of noncompliance, fewer positive nominations). ^c *n* = 54 for combined and 37 for inattentive types, because some teacher scales were invalid if teacher could rate only medicated behavior.

diagnostic subgroup status and for objective behavior observations of externalizing behavior. It is noteworthy that the DBR Relational Aggression scale showed particularly large differences for the combined subgroup versus the other groups. Whereas the inattentive type was rated by parents as more externalizing than the comparison group, with large effect sizes for the CBCL and SNAP measures, the other variables (DBR Scales, observed aggression), did not reveal inattentive versus comparison differences. As for covariates, ODD/CD was, as expected, a significant contributor to multivariate differences regarding disruptive behavior; yet even with its statistical control, the ADHD subgroup variable remained highly significant in its multivariate effect. In fact, univariate ANCOVAs revealed that each of the seven variables retained significant effects of subgroup with control of ODD/CD. Similarly, subgroup effects were still significant with control of age.

Second, in the domain of internalizing symptomatology, the MANOVA was significant, Pillai's trace = 0.54, $F(12, 434) = 13.52, p < .01$. Univariate analyses showed that both the source of information and the specific item content had influence on subgroup effects (see Table 2). For CBCL Internalizing scores and CDI scores, all ADHD subgroups showed large elevations over the comparison girls but were themselves indistinguishable. On the MASC and DBR Withdrawn scale, however, all three subgroups were statistically equivalent. For the observational category of social isolation, the inattentive group scored higher than the combined and comparison groups, which did not differ. For the DBR Anxiety/Depression scale, a stepwise pattern of results emerged, with the combined group scoring highest, the inattentive group second highest, and the comparison girls lowest, with all differences significant. As for covariates, the multivariate effect of subgroup remained strongly significant with control of ODD/CD comorbidity, and univariate ANCOVAs revealed that CBCL Internalizing, CDI, DBR Anxious/Depressed, and observed social isolation maintained significant subgroup effects. Subgroup effects were also maintained with control of age.

Third, in the domain of peer social regard, the MANOVA was, again, highly significant, Pillai's trace = 0.266, $F(4, 450) = 17.28, p < .01$. Both positive and negative nominations showed significant ANOVAs. For positive nominations both ADHD subgroups, which did not differ significantly, had lower proportions than did the comparison girls (with medium to large effects); for negative

nominations all subgroups differed significantly, with the combined subgroup scoring highest, the inattentive group intermediate, and the comparison girls lowest (see Table 2). Effects here were of medium to large size. Subgroup effects maintained strong significance with control of both disruptive comorbidity and age.

Cognitive and Achievement Tests

In the domain of WISC-III and WIAT scores, the MANOVA was highly significant, Pillai's trace = 0.25, $F(12, 424) = 4.99, p < .01$. All six ANOVAs were significant, with identical subgroup contrasts: Each ADHD subgroup scored significantly lower than did the comparison girls, with effect sizes of the contrasts ranging from medium to large; but the combined and inattentive subgroups did not themselves significantly differ (see Table 3). Thus, contrary to hypothesis, no evidence was found that the inattentive type performed worse than the combined type on cognitive or achievement-related measures. Note that, as in many other samples, the mean cognitive and achievement scores for the girls with ADHD were in the normal range (e.g., Biederman et al., 1999), but the comparison girls scored half a standard deviation or more above published national norms. Subgroup effects maintained strong significance with control of ODD/CD comorbidity and age.

Parenting Practices

In this domain, the MANOVA was significant, Pillai's trace = 0.18, $F(16, 388) = 2.40, p < .01$ (see Table 4). None of the five ANOVAs with the Alabama Parenting Questionnaire scales yielded significant subgroup differences, whereas two of the three IAP Scales showed significant univariate differences (Authoritarian and Overwhelmed/Unsure). For these scales, the combined subgroup scored higher than the comparison girls (effect sizes medium), with the inattentive subgroup intermediate but not significantly different from either of the two. As for covariates, the subgroup effect was rendered marginally significant with control of ODD/CD, Pillai's trace = 0.15, $F(16, 384) = 1.91, p < .05$. At the univariate level, only the subgroup effect for IAP Authoritarian remained significant with control of ODD/CD. Control of age did not alter subgroup effects.

Table 3
Cognitive and Achievement Tests by Diagnostic Subgroup

Variable	A. Combined (n = 93)		B. Inattentive (n = 47)		C. Comparison (n = 88)		p ^a	Effect size ^b		
	M	SD	M	SD	M	SD		A-B	A-C	B-C
WISC-III Verbal Comprehension	100.6 _a	13.3	102.8 _a	16.5	113.7 _b	13.3	<.01	0.14	0.86	0.72
WISC-III Perceptual Organization	100.7 _a	14.8	100.1 _a	13.9	108.9 _b	14.3	<.01	-0.04	0.55	0.59
WISC-III Freedom From Distractibility	98.0 _a	13.5	96.3 _a	11.9	109.6 _b	10.9	<.01	-0.11	0.86	0.97
WISC-III Processing Speed	100.2 _a	16.1	99.4 _a	15.3	108.1 _b	14.3	.01	-0.05	0.50	0.55
WIAT Basic Reading	102.1 _a	14.6	101.1 _a	14.2	112.0 _b	12.6	<.01	-0.07	0.68	0.75
WIAT Math Reasoning	97.3 _a	14.2	97.9 _a	14.6	109.1 _b	13.8	<.01	-0.04	0.78	0.74

Note. WISC-III = Wechsler Intelligence Scale for Children (3rd ed.); WIAT = Wechsler Individual Achievement Test.
^a Level of significance from one-way analysis of variance. Means with different subscripts in a given row differ significantly on the basis of Tukey's post hoc comparisons. ^b Effect size (ES) is Cohen's *d*, reflecting contrast of first-lettered subgroup versus second-lettered subgroup, with positive value of ES reflecting greater deviance in the first subgroup (e.g., lower IQ score).

Table 4
Parent-Reported Parenting Practices by Diagnostic Subgroup

Variable	A. Combined (<i>n</i> = 93)		B. Inattentive (<i>n</i> = 47)		C. Comparison (<i>n</i> = 88)		<i>p</i> ^a	Effect size ^b		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		A–B	A–C	B–C
Alabama Parenting Questionnaire										
Involvement	38.4	4.9	39.1	3.9	39.6	4.9	<i>ns</i>	0.11	0.24	0.12
Positive parenting	25.2	3.0	25.6	3.2	24.6	3.4	<i>ns</i>	0.12	–0.18	–0.30
Poor monitoring/supervision	14.2	4.2	13.4	3.1	13.4	3.0	<i>ns</i>	0.16	0.23	0.08
Inconsistent discipline	14.5	3.2	13.7	3.6	13.4	3.2	<i>ns</i>	0.20	0.31	0.11
Corporal punishment	4.6	1.7	4.3	2.0	4.0	1.3	<i>ns</i>	0.20	0.38	0.17
Ideas About Parenting										
Authoritarian (<i>z</i> score)	0.24 _a	1.0	–0.12 _{a,b}	1.1	–0.22 _b	0.9	<.01	0.36	0.46	0.10
Authoritative (<i>z</i> score)	–0.10	1.1	–0.08	1.0	0.17	0.8	<i>ns</i>	0.02	0.27	0.25
Overwhelmed/unsure (<i>z</i> score)	0.19 _a	1.0	0.11 _{a,b}	1.1	–0.30 _b	0.9	<.01	0.08	0.49	0.41

^a Level of significance from one-way analysis of variance. Means with different subscripts in a given row differ significantly on the basis of Tukey's post hoc comparisons. ^b Effect size (ES) is Cohen's *d*, reflecting contrast of first-lettered subgroup versus second-lettered subgroup, with positive value of ES reflecting greater deviance in the first subgroup (e.g., greater level of corporal punishment).

Discussion

The overall goal of the present investigation was to characterize a large and diverse preadolescent sample of girls who were carefully diagnosed with ADHD, both combined and inattentive types, in relation to a demographically and ethnically equated sample of comparison girls. Assessments were multimethod and multi-informant in nature, including objective behavior observations and peer sociometrics conducted in a naturalistic setting, affording a rich examination of several key domains of the participants' functioning. Indeed, the measures were selected to reflect a theoretical conception of ADHD as a psychobiologically based disorder with the potential for considerable transaction with psychosocial influences and impairment in key areas of behavioral, cognitive, and psychosocial functioning. They were also chosen to capture aspects of female development and functioning. Overall, this report of the largest sample of preadolescent girls with ADHD in the field demonstrates the multiple impairments associated with the disorder in girls. In particular, the clinical sample displayed (a) a large number of risk and etiologic variables and correlates, including histories of adoption and abuse; (b) substantial comorbidities in the internalizing and disruptive spectrums; (c) cognitive performance that was (although in the average range) lower than that of comparison girls; (d) noteworthy peer rejection; and (e) a slight but significant tendency for parents to adopt authoritarian discipline styles (although ODD/CD comorbidity partially explained such effects). Inattentive versus comparison subtype contrasts were not, by and large, salient; clear exceptions were the strong likelihood for the combined type to display histories of abuse and patterns of peer rejection and for the inattentive type to be observed as showing social isolation. The findings suggest plentiful avenues of investigation with regard to understanding mechanisms and processes associated with both impairment and competence in girls with ADHD.

Before discussing implications of these findings, I provide commentary on the nature of the recruitment and sampling procedures and the generalizability of the present sample. First, I make no claim that the ADHD sample is truly representative of the population of girls with ADHD in this region (or in the United States as

a whole) nor that the comparison girls are representative of non-diagnosed girls. Indeed, the recruitment strategies were not those of an epidemiologic investigation. Whereas representative sampling is essential if the goal is to obtain unbiased estimates of prevalence, comorbidity, and associated features (for lucid discussion, see Angold, Costello, & Erkanli, 1999; Goodman et al., 1997) or to elucidate specific male–female differences (Gaub & Carlson, 1997), my aims were to make intensive study of patterns of impairment, social relationships, cognitive functioning, and family interactions in a large, diverse, and well-characterized sample of girls with ADHD, in the context of same-sex social interaction patterns. It is difficult to imagine how the intensity or objectivity of data collection performed herein could be attempted with representative, epidemiologic samples, which are typically restricted to questionnaires or structured interviews as the main means of gathering data. Also, given that my staff and I were uncertain as to whether we could recruit and investigate the numbers of female participants we wished to sample, we recruited from mental health, pediatric, and school settings and with general advertisements, ensuring ethnic and socioeconomic diversity and yielding a sample that was a mixture of clinical and nonclinical referrals. The population to which the sample can be generalized is one composed of ethnically and socioeconomically diverse girls who have either been suspected of having ADHD or who have been previously diagnosed and treated in private and public settings and whose families are motivated for a comprehensive assessment and no-cost summer enrichment program. The hope is that the sample can shed light on contemporaneous (and, in the future, prospective) processes and mechanisms related to ADHD and consequent impairments.

Second, at a methodologic level, the initial screening gates involved the use of cutoffs that were intentionally set somewhat low, in accordance with female norms, to prevent the premature elimination of girls with bona fide ADHD on the basis of sex-neutral rating instruments. Yet to qualify for diagnosis, girls had to meet full diagnostic criteria for ADHD on the basis of the DISC-IV and the SNAP-IV. This type of algorithm—with initial cutoffs attuned to sex norms but final inclusion made on the basis

of sex-neutral criteria—has been favored by many in the field (Arnold, 1996; but see counterargument in Barkley, 1998). It remains to be seen which type of diagnostic procedures yield the optimal means of diagnosing girls with clear impairment.

Third, how comparable were the ADHD and comparison samples in terms of ascertainment? As discussed in the Method section, recruitment for each was performed in the same communities through mailings to schools and community centers and by direct advertisement in daily newspapers, whereas recruitment of girls through mental health centers, HMOs, or pediatric practice was restricted to girls with ADHD. I point out, in addition, the non-significant differences (and small effect sizes) between ADHD and comparison samples with respect to all demographic variables, suggesting comparability of the samples on such key family and neighborhood background variables.

In terms of substantive findings, I first comment on background and risk measures. Here, the girls with ADHD (in both subtypes) had rates of adoption greater than 20%, five to six times higher than the rate for our comparison girls. These figures reflect rates from both clinical and community investigations over the last 2 decades (Deutsch et al., 1982; Simmel et al., 2001). Indeed, Simmel et al. (2001) discussed the particular risks related to adoption that may influence the development of ADHD and disruptive behavior disorders. Note, however, that the adoptions herein included both planned adoptions in the first months of life and late adoptions following several foster placements. The latter tend to incur, by far, the greatest risks for impairment (Simmel et al., 2001). On the other hand, higher-than-expected rates of documented child abuse pertained largely to the combined type. Briscoe and Hinshaw (2002) detailed the ways in which girls with ADHD plus histories of abuse differ systematically from the nonabused girls with ADHD. I also note that whereas low birth-weight has been demonstrated as a risk factor for ADHD in well-designed prospective investigations (e.g., Whitaker et al., 1997), this variable did not distinguish our present subgroups.

Second, as for profiles of behavioral manifestations and comorbidities, an initial point is that the two subtypes (combined and inattentive) had statistically equivalent rates of symptomatology related to inattention and disorganization, at least in terms of scores on parent-reported ratings (CBCL, SNAP-IV). Thus, there was no evidence for greater scores related to dimensional markers of inattention in either subgroup. Whether children with the inattentive type display a qualitatively different type of attentional processing difficulties is beyond the scope of this report (see also Hinshaw et al., 2002).

As expected, the combined type showed far greater rates and proportions of behaviors and diagnoses related to aggression and disruptive features than did the inattentive type, who, in turn, scored higher than comparison girls. I must point out, however, a discrepancy between (a) the rates of comorbidity with disruptive behavior disorders, on the one hand, and (b) dimensional scores from more objective observational measures. Indeed, DISC-IV rates of ODD and CD were 71% and 26% for girls in the combined type, far higher than those reported by Biederman et al. (1999) and approaching or surpassing rates reported for many samples of boys, whereas rates of aggressive behavior from our observational system were well below rates from comparable summer programs for boys with ADHD (e.g., Hinshaw, Zupan, et al., 1997). It is possible that the DISC-IV overinflated rates of these disruptive

disorders; it is also possible that parents of girls with ADHD, attempting to gain admission to a summer enrichment program, felt a press to accentuate behavioral difficulties in their daughters. Different structured interviews used by different investigative teams complicate simple interpretations of findings (see Angold & Fisher, 1999). Further research on disruptive comorbidities in girls is needed (indeed, see Loeber & Keenan, 1994, for discussion of the “gender paradox” of atypically high comorbidities in the sex with lower base rates of the disorder in question).

Third, in terms of internalizing comorbidities and associated internalizing behaviors, findings varied with source of information. Girls with ADHD did not self-report higher levels of anxiety than comparison girls on the MASC, but they did so with respect to depression on the CDI. Yet staff ratings and observations sources yielded significant ADHD-comparison differences. Furthermore, in no instance did parent or child self-report statistically distinguish the subtypes of ADHD with respect to internalizing symptoms, whereas counselor ratings and objective observations did yield subtype distinctions. Specifically, the combined type was rated by staff as showing higher levels of anxiety and depression, but the inattentive type was observed to have greater levels of social withdrawal.

Fourth, with respect to peer sociometrics, the present findings support a growing literature (e.g., Maedgen & Carlson, 2000) suggesting that the subtypes of ADHD reveal different patterns of peer disapproval. Specifically, even though the atypically high ratio of ADHD to normal comparison girls in our summer programs probably served to attenuate the social disapprobation received by the diagnosed group, the effect size regarding the higher rate of negative nominations for the combined versus the inattentive type was medium to large, the effect size for the combined type versus comparison girls was extremely large, and for the inattentive versus comparison girls was medium. In addition, although rates of positive nominations did not distinguish the subgroups of girls with ADHD, both had lower rates than did comparison girls (with a medium effect size). Understanding the processes underlying peer disapproval in girls with ADHD is another key topic for future research.

Fifth, with respect to cognitive and academic problems, the current sample of girls with ADHD was reported by their parents to have had noteworthy histories of speech and language delay (see Baker & Cantwell, 1992), although the expected preponderance of such problems in the inattentive type was not found. As predicted, the ADHD subgroups had noteworthy histories of grade retention and special education placement (Barkley, 1998). In terms of objective test performance, all WISC-III factor scores, as well as tests of reading recognition and mathematics, clearly distinguished ADHD from comparison groups but failed to confirm predictions that the inattentive type would show particular deficits (see Gaub & Carlson, 1997). In-depth exploration of the neuropsychological performance of our sample is found in Hinshaw et al. (2002).

Sixth, regarding self-reported parenting practices and attitudes, although the MANOVA was significant, the univariate differences between families of ADHD and comparison samples were fewer in number and weaker in magnitude than hypothesized. In fact, the only parenting dimensions yielding significant differences (between combined and comparison groups) pertained to authoritarian parenting and a sense of being overwhelmed in and unsure of the parenting role. Control of ODD/CD status reduced this subgroup

effect. In the continuing debate about the directionality of effects between parent and child in families of youth with behavior disorders, the present findings could well reflect (a) the difficulties inherent in attempting to raise a child with poor self-regulation and impulse control, (b) the effects of authoritarian and overwhelmed parenting on girls' developing self-regulation, or (c) reciprocal and transactional models reflecting both child effects on parents and parent effects on the child (Johnston & Mash, 2001). Such harsh parenting styles could also portend the development of aggressive behavior patterns or comorbidities (e.g., Patterson, Reid, & Dishion, 1992). Examination of bidirectional effects, their moderation by ethnicity of the child and family, and objective coding of videotaped parent-child interactions are ongoing efforts.

Regarding potential limitations of the investigation, I first highlight, once again, the nature of the sample selected. Although not epidemiologic in scope, the present sample appears to reflect a heterogeneous and reasonably representative sample of girls with ADHD, both those receiving current treatment and those identified for the first time as part of the study screening procedures. The key goal herein was to appraise our all-female sample intensively, which would not have been possible with traditional epidemiologic sampling methods. Future investigations should include both representative and clinical samples, as each may be uniquely suited to addressing different questions (Goodman et al., 1997).

Second, although the HI subtype of ADHD was not included, a key aim was to preserve statistical power for the inattentive vs. combined contrasts. Third, regarding measurement, several of the background variables reflected single-item measures from a parent questionnaire requiring retrospective recall of historical variables, potentially engendering problems with reliability. In addition, the observational measures, the two-item DBR scale of covert behavior, and several of the parenting subscales displayed marginal interobserver agreements or interitem consistencies. Also, space limitations precluded the reporting of data on parental psychiatric disorder in this report; this important variable will be pursued subsequently. Fourth, the large number of measures of interest in this report required the use of multiple statistical tests. Yet the consistent patterns of multivariate significance, the use of an alpha level of .01, and the often-large effect sizes increase confidence in the findings.

Another potential limitation pertains to the choice of the DISC-IV for ascertaining caseness as well as comorbidity. This instrument is a highly structured, lay interview originally designed for epidemiologic investigations; the fourth edition takes great pains to incorporate criteria related to impairment in all diagnoses (Shaffer et al., 2000). It provides a counterpoint to less structured diagnostic interviews that require greater levels of professional clinician input and judgment (Angold & Fisher, 1999). I point out that the investigation of Biederman et al. (1999) also used non-professional interviewers (bachelor's-level), who administered the Schedule for Affective Disorders and Schizophrenia for School-aged Children, Epidemiologic Version (Orvaschel, 1985). Why the DISC-IV yielded such high rates of ODD and CD (but not internalizing comorbidities) in the present investigation is not clear. Whereas overall psychometric data on the DISC-IV are promising, further research on the optimal means of diagnosing mental disorders in children is an ongoing concern.

It is noteworthy that the subgroup differences that emerged herein were almost entirely robust to statistical control of disrupt-

tive comorbidity (ODD/CD status) and to participant age. Because children with the combined type of ADHD are far more likely to display such disruptive comorbidity than are those with the inattentive type, investigations that attempt to localize impairments and deficits to ADHD subtype must control for the comorbid disorders (e.g., Paternite, Loney, & Roberts, 1996). The robustness of the findings herein attest to the meaningful nature of the ADHD combined versus ADHD inattentive designation (see also Milich et al., 2001). In addition, age manifestations are better investigated through prospective longitudinal designs than through cross-sectional reports such as this one.

In conclusion, the current report highlights that (a) preadolescent females with ADHD display both noteworthy psychiatric comorbidities and clear impairments in key domains of cognitive functioning, disruptive and internalizing behavior, and peer relationships; (b) their clear impairments are not explained by comorbid disorders; and (c) further exploration of the processes and mechanisms related to ADHD in girls is a key priority. A primary focus herein was the intensive study of girls with ADHD without explicit comparison to boys, in keeping with the contention that explicit investigation of important subgroups (e.g., females, persons of a particular ethnic group or social class) on their own terms and in their own right is an important and viable step along the way toward investigations that explicitly compare the sexes, different ethnic groups, or disparate social strata. The current investigation shows the value of elucidating female manifestations of and impairments related to ADHD.

References

- Achenbach, T. M. (1991). *Manual for the Child Behavior Checklist 4/18 Profile 1991*. Burlington, VT: University Associates in Psychiatry.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Angold, A., Costello, J., & Erkanli, A. (1999). Comorbidity. *Journal of Child Psychology & Psychiatry*, 40, 57-87.
- Angold, A., & Fisher, P. (1999). Interviewer-based interviews. In D. Shaffer, C. P. Lucas, & J. E. Richters (Eds.), *Diagnostic assessment in child and adolescent psychopathology* (pp. 34-64). New York: Guilford Press.
- Arnold, L. E. (1996). Sex differences in ADHD: Conference summary. *Journal of Abnormal Child Psychology*, 24, 555-569.
- Baker, L., & Cantwell, D. P. (1992). Attention-deficit disorder and speech/language disorders. *Comprehensive Mental Health Care*, 2, 3-16.
- Barkley, R. A. (1997). *ADHD and the nature of self-control*. New York: Guilford Press.
- Barkley, R. A. (1998). *Attention-deficit/hyperactivity disorder: A handbook for diagnosis and treatment* (2nd ed.). New York: Guilford Press.
- Biederman, J., Faraone, S. V., Keenan, K., Kline, D., & Tsuang, M. (1990). Family-genetic and psychosocial risk factors in girls with DSM-III attention-deficit disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, 29, 526-533.
- Biederman, J., Faraone, S. V., Mick, E., Williamson, S., Wilens, T., Spencer, T. J., et al. (1999). Clinical correlates of ADHD in females: Findings from a large group of girls ascertained from pediatric and psychiatric referral sources. *Journal of the American Academy of Child & Adolescent Psychiatry*, 38, 966-975.
- Blachman, D. R., & Hinshaw, S. P. (in press). Patterns of friendship in girls with and without attention-deficit/hyperactivity disorder. *Journal of Abnormal Child Psychology*.
- Briscoe, A., & Hinshaw, S. P. (2002). *Child abuse and attention-deficit/*

- hyperactivity disorder in girls: Effects on multiple domains of function.* Unpublished manuscript, University of California, Berkeley.
- Chen, W. J., Faraone, S. V., Biederman, J., & Tsuang, M. T. (1994). Diagnostic accuracy of the Child Behavior Checklist scales for attention-deficit/hyperactivity disorder: A receiver-operating characteristic analysis. *Journal of Consulting and Clinical Psychology, 62*, 1017–1025.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences.* Hillsdale, NJ: Erlbaum.
- Crick, N. R., & Grotpeter, J. K. (1995). Relational aggression, gender, and social-psychological adjustment. *Child Development, 66*, 710–722.
- Deutsch, C. K., Swanson, J. M., Bruell, J. H., Cantwell, D. P., Weinberg, F., & Baren, M. (1982). Overrepresentation of adoptees in children with the attention-deficit disorder. *Behavioral Genetics, 12*, 231–238.
- DuPaul, G. J., Power, T. J., McGoey, K. E., Ikeda, M. J., & Anastopoulos, A. D. (1998). Reliability and validity of parent and teacher ratings of attention-deficit/hyperactivity disorder symptoms. *Journal of Psycho-educational Assessment, 16*, 55–68.
- Faraone, S. V., Biederman, J., Mick, E., Williamson, S., Wilens, T., Spencer, T., et al. (2000). Family study of girls with attention-deficit/hyperactivity disorder. *American Journal of Psychiatry, 157*, 1077–1083.
- Gaub, M., & Carlson, C. L. (1997). Gender differences in ADHD: A meta-analysis and critical review. *Journal of the American Academy of Child & Adolescent Psychiatry, 36*, 1036–1046.
- Gittelman, R., Mannuzza, S., Shenker, R., & Bonagura, N. (1985). Hyperactive boys almost grown up: I. Psychiatric status. *Archives of General Psychiatry, 42*, 937–947.
- Gjone, H., Stevenson, J., & Sundet, J. (1996). Genetic influence on attention problems in a general population twin sample. *Journal of the American Academy of Child & Adolescent Psychiatry, 45*, 588–596.
- Goodman, S. H., Lahey, B. B., Fielding, B., Dulcan, M., Narrow, W., & Regier, D. (1997). Representativeness of clinical samples of youths with mental disorders: A preliminary population-based study. *Journal of Abnormal Psychology, 106*, 3–14.
- Greenhill, L. L., & Osman, B. B. (2000). *Ritalin: Theory and practice* (2nd ed.). Larchmont, NY: Mary Ann Liebert.
- Heming, G., Cowan, P. C., & Cowan, C. P. (1990). Ideas about parenting. In J. Touliatos, P. F. Perlmutter, & M. A. Straus (Eds.), *Handbook of family measurement techniques* (pp. 382–383). Thousand Oaks, CA: Sage.
- Hinshaw, S. P. (1987). On the distinction between attentional deficits/hyperactivity and conduct problems/aggression in child psychopathology. *Psychological Bulletin, 101*, 443–463.
- Hinshaw, S. P. (1994). *Attention deficits and hyperactivity in children.* Thousand Oaks, CA: Sage.
- Hinshaw, S. P. (1999). Psychosocial intervention for childhood ADHD: Etiologic and developmental themes, comorbidity, and integration with pharmacotherapy. In D. Cicchetti & S. L. Toth (Eds.), *Rochester Symposium on Developmental Psychopathology: Vol. 9. Developmental approaches to prevention and intervention* (pp. 221–270). Rochester, NY: University of Rochester Press.
- Hinshaw, S. P. (in press). Is ADHD an impairing condition in childhood and adolescence? In P. S. Jensen & J. R. Cooper (Eds.), *Diagnosis and treatment of attention-deficit/hyperactivity disorder: An evidence-based approach.* Washington, DC: American Psychiatric Press.
- Hinshaw, S. P., Carte, E. T., Sami, N., Treuting, J. J., & Zupan, B. A. (2002). Preadolescent girls with attention-deficit/hyperactivity disorder: II. Neuropsychological performance in relation to subtypes and individual classification. *Journal of Consulting and Clinical Psychology, 70*, 1099–1111.
- Hinshaw, S. P., March, J. S., Abikoff, H., Arnold, L. E., Cantwell, D. P., Conners, C. K., et al. (1997). Comprehensive assessment of childhood attention-deficit/hyperactivity disorder in the context of a multisite, multimodal clinical trial. *Journal of Attention Disorders, 1*, 217–234.
- Hinshaw, S. P., & Melnick, S. (1995). Peer relationships in children with attention-deficit/hyperactivity disorder with and without comorbid aggression. *Development and Psychopathology, 7*, 627–647.
- Hinshaw, S. P., Simmel, C., & Heller, T. (1995). Multimethod assessment of covert antisocial behavior in children: Laboratory observations, adult ratings, and child self-report. *Psychological Assessment, 7*, 209–219.
- Hinshaw, S. P., Zupan, B. A., Simmel, C., Nigg, J. T., & Melnick, S. M. (1997). Peer status in boys with and without attention-deficit/hyperactivity disorder: Predictions from overt and covert antisocial behavior, social isolation, and authoritative parenting beliefs. *Child Development, 64*, 880–896.
- James, A., & Taylor, E. (1990). Sex differences in the hyperkinetic syndrome of childhood. *Journal of Child Psychology & Psychiatry, 31*, 437–446.
- Jensen, P. S., Martin, D., & Cantwell, D. P. (1997). Comorbidity in ADHD: Implications for research, practice, and DSM-V. *Journal of the American Academy of Child & Adolescent Psychiatry, 36*, 1065–1079.
- Johnston, C., & Mash, E. J. (2001). Families of children with attention-deficit/hyperactivity disorder: Review and recommendations for future research. *Clinical Child & Family Psychology Review, 4*, 183–207.
- Kashani, J., Chapel, J., Ellis, J., & Shekim, W. (1979). Hyperactive girls. *Journal of Operational Psychology, 10*, 145–148.
- Kaufman, A. S. (1994). *Intelligent testing with the WISC-III.* New York: Wiley.
- Kendler, K. S. (1990). The super-normal control group in psychiatric genetics: Possible artifactual evidence for coaggregation. *Psychiatric Genetics, 1*, 45–53.
- Kovacs, M. (1992). *Children's Depression Inventory (CDI) manual.* Toronto, Ontario, Canada: Multi-Health Systems.
- Lahey, B. B., Applegate, B., McBurnett, K., Biederman, J., Greenhill, L. L., Hynd, G., et al. (1994). DSM-IV field trials for attention-deficit/hyperactivity disorder in children and adolescents. *American Journal of Psychiatry, 151*, 1673–1685.
- Loeber, R., & Keenan, K. (1994). Interaction between conduct disorder and its comorbid conditions: Effects of age and gender. *Clinical Psychology Review, 14*, 497–523.
- Loney, J., Kramer, J., & Milich, R. (1981). The hyperkinetic child grows up: Predictors of symptoms, delinquency, and achievement at follow-up. In K. Gadow & J. Loney (Eds.), *Psychosocial aspects of drug treatment for hyperactivity* (pp. 381–415). Boulder, CO: Westview Press.
- Lyon, G. R. (1996). Learning disabilities. In E. J. Mash & R. A. Barkley (Eds.), *Child psychopathology* (pp. 390–435). New York: Guilford Press.
- Maccoby, E. (1998). *The two sexes: Growing up apart, coming together.* Cambridge, MA: Harvard University Press.
- Maedgen, J. W., & Carlson, C. L. (2000). Social functioning and emotion regulation in the attention-deficit/hyperactivity disorder subtypes. *Journal of Clinical Child Psychology, 29*, 30–42.
- March, J. S. (1998). *Multidimensional Anxiety Scale for Children.* Toronto, Ontario, Canada: Multi-Health Systems.
- 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 & Adolescent Psychiatry, 36*, 554–565.
- McBurnett, K., Piffner, 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.
- Milich, R., Balentine, A., & Lynam, D. (2001). ADHD combined type and ADHD predominantly inattentive type are distinct and unrelated disorders. *Clinical Psychology: Science & Practice, 8*, 463–488.
- MTA Cooperative Group. (1999). Fourteen-month randomized clinical trial of treatment strategies for attention-deficit/hyperactivity disorder. *Archives of General Psychiatry, 56*, 1073–1086.
- NIH Consensus Statement. (1998). *Diagnosis and treatment of attention-*

- deficit/hyperactivity disorder (ADHD)*. Rockville, MD: U.S. Government Printing Office.
- Orvaschel, H. (1985). Psychiatric interviews suitable for use in research with children and adolescents. *Psychopharmacology Bulletin*, *21*, 737–745.
- Paternite, C. E., Loney, J., & Roberts, M. A. (1996). A preliminary validation of subtypes of *DSM-IV* attention-deficit/hyperactivity disorder. *Journal of Attention Disorders*, *1*, 70–86.
- Patterson, G. R., Reid, J., & Dishion, T. (1992). *Antisocial boys*. Eugene, OR: Castalia.
- Shaffer, D., Fisher, P., Lucas, C. P., Dulcan, M. K., & Schwab-Stone, M. E. (2000). NIMH Diagnostic Interview Schedule for Children Version IV (NIMH DISC-IV): Description, differences from previous versions, and reliability of some common diagnoses. *Journal of the American Academy of Child & Adolescent Psychiatry*, *39*, 28–38.
- Shelton, K. K., Frick, P. J., & Wootton, S. (1996). Assessing the parenting practices in families of elementary school-age children. *Journal of Clinical Child Psychology*, *25*, 317–329.
- Simmel, C., Brooks, D., Barth, R. P., & Hinshaw, S. P. (2001). Externalizing symptomatology among adoptive youth: Prevalence and preadoption risk factors. *Journal of Abnormal Child Psychology*, *29*, 57–69.
- SPSS, Inc. (1999). *SPSS 10.0 for Windows*. Chicago: Author.
- Swanson, J. M. (1992). *Assessment and treatment of ADD students*. Irvine, CA: K. C. Press.
- Tannock, R. (1998). Attention-deficit/hyperactivity disorder: Advances in cognitive, neurobiological, and genetic research. *Journal of Child Psychology & Psychiatry*, *39*, 65–99.
- Wechsler, D. (1991). *Manual for the Wechsler Intelligence Scale for Children* (3rd ed.). New York: Psychological Corporation/Harcourt Brace.
- Wechsler, D. (1992). *Manual for the Wechsler Individual Achievement Test*. New York: Psychological Corporation/Harcourt Brace.
- Weiler, M. D., Bellingier, D., Simmons, E., Rappaport, L., Urion, D. K., Mitchell, W., et al. (2000). Reliability and validity of a *DSM-IV* based ADHD screener. *Child Neuropsychology*, *6*, 3–23.
- Whalen, C. K., & Henker, B. (1980). Methylphenidate and hyperactivity: Effects on teacher behaviors. *Science*, *208*, 1280–1282.
- Whitaker, A. H., Von Rossen, R., Feldman, J. F., Schonfeld, I. S., Pinto-Martin, J. A., Torre, C., Shaffer, D., & Paneth, N. (1997). Psychiatric outcomes in low-birth-weight children at age 6 years: Relation to neonatal cranial ultrasound abnormalities. *Archives of General Psychiatry*, *54*, 847–856.

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