

# Relationships Between Problem Behaviors and Academic Achievement in Adolescents:

## The Unique Role of Attention Problems

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A SUBSTANTIAL BODY OF RESEARCH has documented associations between problem behaviors and academic achievement. This topic has relevance from an educational perspective that views problem behaviors as serious impediments to optimal education. From a psychopathology perspective, low academic achievement represents a significant risk factor for poor behavioral outcomes. A systemic viewpoint posits that behavioral and academic problems exert reciprocal influences on one another, which, over time, can negatively affect the development of individuals and their environments. Regardless of perspective, a clear understanding of the relationship between problem behaviors and academic achievement will help generate appropriate assessment, prevention, and intervention strategies for at-risk or troubled youth.

We are using the term *academic underachievement* to denote academic performance that is below normative age

Numerous studies have documented relationships between a variety of problem behaviors and academic achievement measures. However, the results of these studies should be interpreted cautiously, given the considerable comorbidity of problem behaviors that often exists among school-age youth. This study addressed the relationships between 8 teacher-reported problem behavior syndromes (withdrawal, somatic complaints, anxiety/depression, social problems, thought problems, attention problems, delinquent behavior, aggressive behavior) and standardized measures of academic achievement (overall, reading, spelling, arithmetic, performance). The sample comprised 41 boys and 17 girls ages 11 to 19 years ( $M = 15.02$ ,  $SD = 1.90$ ) enrolled in an alternative school. Although withdrawal, somatic complaints, delinquent behavior, and aggressive behavior syndromes exhibited significant zero-order correlations with the academic achievement measures, each of these relationships was mediated by attention problems. A post hoc analysis suggested that the observed association between attention problems and academic achievement was primarily due to the inattention component of the syndrome rather than the hyperactivity-impulsivity component. The findings are discussed with reference to theoretical, research, and treatment implications.

level rather than discrepant from one's general cognitive ability (as in the diagnosis of learning disabilities). A wide variety of problem behaviors have been linked to academic underachievement. For example, investigations have consistently revealed that aggression and other forms of antisocial behavior display inverse relationships with academic achievement (e.g., Williams & McGee, 1994).

Additionally, the symptoms of attention-deficit/hyperactivity disorder have shown a robust inverse relationship with achievement (Faraone et al., 1993). Problem behaviors associated with internalizing have also evidenced connections to academic underachievement, though less consistently. Anxiety and negativism have been identified as key personality traits associated with academic problems (Stevens &

Pihl, 1987). Moreover, several researchers have linked depressive disorders or symptoms to underachievement (e.g., Puig-Antich et al., 1993). It is noteworthy that other researchers have found no connections between internalizing symptoms and poor academic performance (e.g., Reinherz et al., 1993). At this time, the evidence regarding this relationship remains equivocal. In addition to externalizing and internalizing symptoms, quality of social relations has been linked to academic achievement and related variables. A subjective sense of belonging and interpersonal support has been associated with higher achievement motivation and educational plans (Cotterell, 1992; Goednow, 1993). Conversely, peer rejection has been found to be a risk factor for academic underachievement (e.g., Ollendick, Weist, Borden, & Greene, 1992).

Interpretation of this research should proceed cautiously. Research of problem behaviors is complicated by the fact that many children and adolescents exhibit multiple problem behaviors. Significant comorbidity among a substantial proportion of youths has been documented in referred and nonreferred samples (e.g., McConaughy & Achenbach, 1994). Investigators should be aware of potential confounds that can result from associated problem behaviors that are not of primary interest in a particular study. Specifically, in the present study, a problem behavior may exhibit a spurious correlation with academic achievement only because it is associated with another problem behavior that plays a more direct or central role in academic achievement. Studies of externalizing problems have suggested that aggressive behaviors in childhood are related to underachievement primarily because of their associations with attention problems (e.g., Frick et al., 1991). The observed relationships between internalizing behaviors and academic underachievement may also be primarily due to their associations with attention problems, although this hypothesis has not hitherto been tested. This hypothesis is plausible, however, given that attention problems are frequently comorbid with internalizing problems (e.g., Jensen, Martin, & Cantwell, 1997) and some internal-

izing disorders even include symptoms that explicitly refer to attention difficulties (e.g., difficulty concentrating is a symptom of major depressive disorder, generalized anxiety disorder, and post-traumatic stress disorder).

Attention problems may represent a syndrome that is not only comorbid with, and conceptually related to, a variety of other syndromes but also fundamentally involved in academic underachievement. Attention deficiencies could represent core elements of poor academic functioning that can coexist with a variety of other problem behaviors that do not necessarily have a direct impact on academic achievement. To evaluate this hypothesis, the relationships between eight teacher-reported problem behavior syndromes (withdrawal, somatic complaints, anxiety/depression, social problems, thought problems, attention problems, delinquent behavior, aggressive behavior) and standardized measures of academic achievement (overall, reading, spelling, arithmetic, performance) were assessed. Our primary aim was to determine whether or not attention problems mediate the relationships between other problem behaviors and academic underachievement. A secondary aim was to explore possible curvilinear and moderated relationships between these sets of variables.

## METHOD

### Participants

Participants were 41 boys and 17 girls ages 11 to 19 years ( $M = 15.02$ ,  $SD = 1.90$ ) enrolled in an alternative school that served a predominantly urban area of a large eastern city. Students were referred to the alternative school by school administrators in their home districts who had determined that interventions attempted to that point had proven ineffective for them. The vast majority of students were referred for disruptive behavior (especially aggression) and poor interpersonal relationships with peers and teachers. A minority of students were referred for other problems such as truancy, depression, and school phobia. Although archival data were not available for each

student, the attending psychologist at the school approximated that 70% of these children were identified with severe emotional disturbance, and their IQs were generally in the low average and borderline intellectual functioning ranges. The participants were 55% Caucasian and 45% African American.

### Measures

*Teacher's Report Form for Ages 5 to 18* (TRF; Achenbach, 1991b). The TRF is a multidimensional behavior rating scale designed to appraise youths' academic and adaptive functioning as well as their problem behaviors. The Academic Performance scale, which assesses teachers' perceptions of students' academic work across several subjects relative to grade level, was used as a teacher-reported measure of academic achievement. The eight problem scales (Withdrawal, Somatic Complaints, Anxiety/Depression, Social Problems, Thought Problems, Attention Problems, Delinquent Behavior, and Aggressive Behavior) were used to represent the various problem behaviors of interest in the present study. Achenbach (1991a) reported extensive favorable reliability (test-retest, internal consistency, interrater) and validity (content, convergent, divergent, discriminant, factor-analytic) findings for the TRF.

Because we investigated the TRF problem scales in relation to academic achievement measures, we eliminated four TRF problem items that were judged to be confounded with academic achievement: "Has difficulty learning," "Poor school work," "Messy work," and "Underachieving, not working up to potential." Removing these items was necessary to avoid a tautologous comparison (i.e., criterion contamination that could produce spuriously high correlation estimates). The four eliminated items were on the 20-item Attention Problems scale, which was consequently reduced to 16 items. To restore the scale to its original magnitude, raw scale scores computed from the remaining 16 items were multiplied by 1.25 so that they then could be meaningfully converted to *t* scores that were designed to be derived from a 20-item scale.

**Wide Range Achievement Test, Third Edition** (WRAT3; Wilkinson, 1993). The WRAT3 was designed to measure academic achievement in three areas: reading (recognizing and naming letters, pronouncing words out of context), spelling (writing name, writing letters and words to dictation), and arithmetic (counting, reading number symbols, solving oral problems, performing written computations). For each participant, these three standard scores were averaged to compute an Overall Achievement score. The WRAT3 has demonstrated extensive favorable reliability (test-retest, internal consistency, alternate forms) and validity (content, convergent, discriminant) findings (Wilkinson, 1993).

## Procedure

All newly enrolled students over the course of an entire academic year were considered for inclusion in the study. Informed parental consent and personal assent were obtained for every potential participant, and all the students were subsequently assessed. Approximately 1 month after admission, students were administered the WRAT3 on an individual basis (in a quiet, distraction-free room within the school, during a study hall period, with breaks offered) by a licensed psychologist or an intern trained and supervised by the psychologist. During school break periods (e.g., recess, study hall), each student's primary teacher (i.e., the teacher that provided the greatest amount of instruction time to the student) completed a TRF for the student within 1 week of the time he or she completed achievement testing. Teachers were kept unaware of the students' achievement scores.

## RESULTS

### Demographic Variable Analyses

Analyses were conducted to determine whether any demographic variables (gender, ethnicity, chronological age) should be used as control variables in subsequent correlational analyses. Because our principle analyses involved correlations be-

tween problem behavior and academic achievement, potential demographic confounds (i.e., any demographic variables that might be associated simultaneously with problem behaviors and academic achievement) were investigated. A MANOVA was used to test for gender, ethnicity, and gender  $\times$  ethnicity effects on the eight problem behaviors. TRF raw scores (rather than *t* scores) were used in these analyses because TRF *t* scores were derived separately for boys and girls in the normative sample (Achenbach, 1991a) and could obscure any potential gender effects. The only significant effect was for ethnicity,  $F(8, 47) = 2.23, p < .05$ . Subsequent ANOVAs were conducted to test for ethnicity effects on each of the eight problem behaviors, but none of the effects were significant.

Another MANOVA was conducted to test for gender, ethnicity, and gender  $\times$  ethnicity effects on four of the academic achievement measures (Reading, Spelling, Arithmetic, Performance). Overall Academic Achievement was not included in this analysis because it represented the average of the Reading, Spelling, and Arithmetic variables, and would have produced multicollinearity problems (i.e., a singular matrix). The only significant effect was for ethnicity,  $F(4, 51) = 2.75, p < .05$ . Subsequent ANOVAs revealed that African American students ( $N = 26$ ) scored significantly lower than Caucasian students ( $N = 32$ ) on achievement measures. On the Reading subscale, African American students ( $M = 84.00, SD = 17.23$ ) scored lower than Caucasian students ( $M = 95.94, SD = 16.57$ ),  $F(1, 56) = 7.18, p < .01$ . On the Spelling subscale, African American students ( $M = 83.77, SD = 16.93$ ) scored lower than Caucasian students ( $M = 97.69, SD = 15.99$ ),  $F(1, 56) = 10.31, p < .01$ . On the Arithmetic subscale, African American students ( $M = 78.31, SD = 15.31$ ) scored lower than Caucasian students ( $M = 88.84, SD = 13.51$ ),  $F(1, 56) = 7.74, p < .01$ . On the Overall Achievement scale (the average of the Reading, Spelling, and Arithmetic scales), African American students ( $M = 82.03, SD = 14.98$ ) scored lower than Caucasian students ( $M = 94.16, SD = 14.18$ ),  $F(1, 56) = 9.98, p < .01$ . In teacher-rated aca-

dem performance scores, however, African American students ( $M = 41.62, SD = 6.77$ ) did not differ from Caucasian students ( $M = 46.29, SD = 7.46$ ),  $F(1, 56) = 3.10, ns$ .

In addition to gender and ethnicity, we investigated the demographic variable of chronological age. Among the eight problem behaviors, only thought problems correlated with age,  $r(58) = .33, p < .05$ . None of the academic achievement measures correlated with age, and there were no significant gender, ethnicity, or gender  $\times$  ethnicity effects for age.

In sum, gender was not associated with problem behaviors or academic achievement. Although ethnicity was associated with the academic achievement measures, it was not associated with any of the problem behavior measures. Chronological age was associated with only one of the problem behavior measures and none of the academic achievement measures. Given these findings, we determined that there was no need to use any demographic variables as control variables in subsequent analyses.

### Correlation and Regression Analyses

In order to explore the possibility of curvilinear problem behavior-academic achievement relationships, we conducted multiple regression analyses that predicted Overall Achievement and Academic Performance on each of the eight problem scale scores along with its corresponding squared scale score. We did not predict results on the Reading, Spelling, and Arithmetic Achievement subscales separately because they were highly intercorrelated (see Table 1), and the heightened number of comparisons (24) would have significantly raised the likelihood of a Type I error (incorrectly detecting a curvilinear relationship). All variables were zero-centered in these regression analyses to reduce problems associated with multicollinearity. None of the quadratic terms resulted in a significant increase in the amount of variance explained in Overall Achievement or Academic Performance beyond that explained by the corresponding linear term.

After establishing that the relationships of interest were linear, we used correlations to estimate the degree of association between problem behaviors and academic achievement measures (see Table 1). We did not employ any corrections to probabilities (such as the Bonferroni method) because all of these comparisons were planned (see Keppel, 1991). The Withdrawal, Somatic Complaints, Attention Problems, Delinquent Behavior, and Aggressive Behavior scales exhibited significant correlations with academic achievement measures. The Anxiety/Depression, Social Problems, and Thought Problems scales did not correlate significantly with the academic achievement measures.

Multiple regression analyses were conducted to assess the relationships between withdrawal, somatic complaints, delinquent behavior, and aggressive behavior and each of the academic achievement measures, while controlling for attention problems. The same pattern of significance emerged for each analysis. Only attention problems were associated with unique variance in each of the academic achievement measures (see Table 2). Thus, attention problems mediated each of the relationships between the other four problem behaviors and the academic achievement measures.

The possibility of moderated problem behavior–academic achievement relation-

ships was explored through multiple regression analyses. Moderated effects were tested by predicting Overall Achievement and Academic Performance scores from each possible combination of two problem scales along with their corresponding interaction term. As in the analysis of curvilinear relationships, we avoided analyzing Reading, Spelling, and Arithmetic Achievement scores separately because of their high intercorrelations and to reduce the probability of a Type I error (incorrectly detecting a mediated relationship). No interaction effects were significant in these analyses.

### Post Hoc Analyses

Because only attention problems were associated with unique variance in academic achievement across multiple regression analyses, post hoc analyses were conducted to explore this relationship further. In addition to an overall Attention Problems score, the TRF produces a score on each of two subscales that have been factor-analytically derived from the Attention Problems scale (Achenbach & McConaughy, 1997): Inattentive and Hyperactive–Impulsive. We first determined that there were no gender, ethnicity, gender  $\times$  ethnicity, or chronological age effects for either subscale. We then computed zero-order correlations between the two subscales and the measures

of academic achievement (see Table 3). As noted in Table 3, both the Inattentive and Hyperactive–Impulsive subscales exhibited significant correlations with the academic achievement measures.

In order to assess which of the two Attention Problems subscales was most directly associated with academic achievement, we conducted simultaneous multiple regression analyses in which each of the academic achievement measures was predicted from both subscales (see Table 3). In combination, the two subscales were significantly associated with each academic achievement measure (note the  $F_{\text{model}}$  estimates). When considered separately, the standardized partial correlation coefficients were not significant, but were higher for the Inattentive subscale than the Hyperactive–Impulsive subscale for Overall, Reading, Spelling, and Arithmetic Achievement (though the differences in magnitude were not statistically significant). The Inattentive subscale was a significant predictor of Academic Performance, whereas the Hyperactive–Impulsive subscale was not.

## DISCUSSION

Results from our zero-order correlational analyses provide further support for the problem behavior–academic achievement connections observed in previous studies. As expected, aggressive and delinquent

TABLE 1  
Zero-Order Correlations Between Teacher-Reported Problem Behaviors and Academic Achievement Measures

Variable	Overall achievement	Reading achievement	Spelling achievement	Arithmetic achievement	Academic performance	M	SD
Withdrawn behavior	-.23	-.16	-.23	-.25	-.35**	57.64	6.76
Somatic complaints	-.26	-.23	-.25	-.23	-.30*	57.67	8.74
Anxiety/depression	-.10	-.07	-.09	-.14	-.07	54.55	4.63
Social problems	-.14	-.11	-.09	-.21	-.17	58.81	6.69
Thought problems	-.02	-.00	-.01	-.04	.00	55.66	8.99
Attention problems	-.44***	-.38**	-.41**	-.44***	-.37**	57.91	7.29
Delinquent behavior	-.28*	-.31*	-.28*	-.19	-.24	60.76	8.17
Aggressive behavior	-.28*	-.28*	-.23	-.25	-.33*	61.48	7.40
M	88.72	90.59	91.45	84.12	44.19		
SD	15.65	17.76	17.71	15.17	7.47		

Note.  $N = 58$ .

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

TABLE 2  
Simultaneous Multiple Regression Analyses of the Effects of Teacher Reports on  
Academic Achievement Measures

Problem behavior	Overall achievement	Reading achievement	Spelling achievement	Arithmetic achievement	Academic performance
Withdrawn	.03	.08	.01	-.01	-.20
Attention problems	-.46**	-.42**	-.42**	-.43**	-.26
R <sup>2</sup>	.19	.15	.17	.19	.16
F <sub>model</sub>	6.62**	4.70*	5.71**	6.46**	5.33**
Somatic complaints	-.13	-.13	-.13	-.11	-.20
Attention problems	-.40**	-.34*	-.37**	-.40**	-.30*
R <sup>2</sup>	.21	.16	.19	.20	.17
F <sub>model</sub>	7.29**	5.11**	6.38**	6.90**	5.83**
Delinquent behavior	-.12	-.19	-.13	-.01	-.10
Attention problems	-.39**	-.30*	-.36**	-.43**	-.33*
R <sup>2</sup>	.21	.17	.19	.19	.15
F <sub>model</sub>	7.13**	5.70**	6.25**	6.46**	4.70*
Aggressive behavior	-.08	-.13	-.04	-.05	-.19
Attention problems	-.40**	-.31*	-.40**	-.41**	-.27
R <sup>2</sup>	.20	.15	.17	.19	.16
F <sub>model</sub>	6.79**	5.02**	5.74**	6.53**	5.34**

Note. N = 58.

\*p < .05. \*\*p < .01.

behaviors were associated with academic underachievement. The findings within the internalizing domain were less straightforward, much like the extant research in this area. Although anxiety and depression were not related to underachievement (consistent with a number of previous studies), we found significant relationships for two other internalizing behaviors: withdrawal and somatic complaints. Discrepancies in previous studies may have been attributable to the degree that samples exhibited or measures assessed withdrawn and/or somatic symptoms as part of the internalizing construct.

Two additional problem behaviors were not associated with underachievement: social problems and thought problems. Previous studies that linked peer rejection to underachievement have generally used a broader construct than the one assessed by the Social Problems scale in our study. When sociometric methods are used to classify children into a rejected group, that group typically includes a substantial proportion of aggressive and withdrawn children (in fact, these are the major subtypes of rejected peer status). In contrast, the Social Problems scale used in the

present study primarily captures social immaturity and victimization and is distinguished from the Aggressive Behavior and Withdrawal scales. The rejection-underachievement relationship found in previous studies may be principally attributable to the aggressive and/or withdrawn behaviors exhibited by rejected children. Thought problems did not relate to achievement in our sample. This is likely due to the fact that the alternative school setting did not enroll students with significant thought problems (e.g., hallucinations, delusions).

The significant relationships between the aforementioned problem behaviors and academic underachievement were found to be mediated by attention problems. Thus, it appears that many problem behaviors (both externalizing and internalizing) are not directly related to academic underachievement. Rather, they are associated with attention problems that in turn have a negative impact on academic achievement. That attention problems can mediate the relationship between aggressive/delinquent behaviors and underachievement has been documented previously (e.g., Frick et al., 1991). In a

comprehensive literature review addressing this issue, Hinshaw (1992b) concluded that this mediating role of attention problems was evident in childhood but not in adolescence. In adolescence, delinquent behavior was a significant predictor of underachievement, even when attention problems were controlled. Discrepant with this conclusion, our findings indicate that the mediating role of attention problems held for a referred adolescent sample. Unique to our study is the finding that attention problems can mediate the relationships between internalizing behaviors and underachievement.

Our results suggest that within the attention problems domain, the inattention component of this syndrome, rather than the hyperactivity-impulsivity component, is most directly related to academic underachievement (cf. McGee, Williams, & Silva, 1985). Previous studies have failed to find achievement differences between inattentive children with and without hyperactivity (e.g., Edelbrock, Costello, & Kessler, 1984; cf. Hynd et al., 1991). However, studying inattentive children with and without hyperactivity as two separate groups may not be a particularly

TABLE 3  
Zero-Order Correlations and Standardized Partial Correlation Coefficients Between  
Teacher Reports and Academic Achievement Measures

Problem behavior	Overall achievement	Reading achievement	Spelling achievement	Arithmetic achievement	Academic performance
<b>Zero-order correlations</b>					
Inattentive	-.39**	-.36**	-.37**	-.37**	-.37**
Hyperactive-Impulsive	-.31**	-.31*	-.32*	-.34**	-.24
<b>Standardized partial correlation coefficients</b>					
Inattentive	-.34	-.32	-.36	-.27	-.56*
Hyperactive-Impulsive	-.06	-.04	-.02	-.11	.23
$R^2$	.16	.13	.14	.14	.15
$F_{\text{model}}$	5.08**	4.00*	4.44*	4.40*	4.99*

Note.  $N = 58$ .

\* $p < .05$ . \*\* $p < .01$ .

useful concept because symptoms of inattention are present in both groups. Comparisons of children with attention-deficit/hyperactivity disorder should more often compare children who are primarily inattentive not with combined type children, but with those who are primarily hyperactive-impulsive (although these children are rare, especially among school-age samples). An alternative, of course, is to use continuous measures of inattention and hyperactivity-impulsivity while including statistical controls when appropriate.

Our findings with respect to demographic variables should be interpreted cautiously. We did not find gender differences in problem behaviors, unlike previous studies that have generally documented higher levels of externalizing behaviors in boys and higher levels of internalizing behaviors in girls (e.g., Achenbach et al., 1990; Nolen-Hoeksema, 1990). However, two aspects of our sample may have contributed to this nonsignificant finding: (a) the fairly small number of girls in our sample ( $n = 17$ ) may not have been sufficient to detect gender effects and (b) gender comparisons based on our referred sample may not adequately reflect similarities or dissimilarities in the general population. No gender differences were found in academic achievement measures, unlike previous studies that have found higher language

achievement for girls and higher math achievement for boys (e.g., Hedges & Nowell, 1995). As with the nonsignificant gender effect for problem behaviors, the small number of female participants and/or the referred nature of our sample may have accounted for this anomaly.

With respect to race, we found no differences between African American and Caucasian participants on problem behaviors. Although some studies have found heightened problem behaviors among African American youth (e.g., Hare & Castenell, 1985), other studies that have controlled for socioeconomic status have found no such differences (e.g., Dodge, Pettit, & Bates, 1994). Because our African American and Caucasian participants were referred to the alternative school setting from similar neighborhoods and schools, we suspect that they were similar in terms of socioeconomic status. Our finding is thus consonant with research that attributes racial differences in problem behaviors to socioeconomic differences. Regarding academic achievement, Caucasians outperformed African Americans on the standardized measures included in our study. Although this difference may reflect test bias, it may also reflect real racial differences in achievement that are influenced by a number of factors, with socioeconomic status representing only one of those factors (Roscigno, 2000). Generalizations from our

sample should be avoided in light of the fairly small number of African Americans ( $n = 26$ ) included in our study.

Chronological age correlated with only one out of eight problem behaviors in our sample. Achenbach (1991a) similarly found negligible age effects on teacher-reported problem behaviors, with the exception of a positive correlation between age and an item that assessed alcohol and drug use. The lack of age effects on our standardized achievement measures is an artifact of age-related norming and grade-related anchoring for these measures. Because our sample spanned early to late adolescence, it was necessary to evaluate academic achievement relative to same age or grade peers.

Our study was not designed to test for gender, race, or age effects; rather, these demographic variables were investigated as potential confounds to our primary analyses. We chose our sample with primary concern for ecological validity; alternative school students represent adolescents with significant and varied behavioral and academic problems and are thus of particular interest for our research topic. Future studies should be designed specifically to assess the impact of demographic variables in this area of research. Our primary findings should be replicated with larger samples that include different age and ethnic groups. It is also important to assess whether our findings

are replicated for youth at various levels of problem behaviors and academic achievement. The referred nature of our sample may have produced a slight overestimate of the magnitude of relationships between behavioral and academic problems because youth with multiple problems are those most likely to be referred for services.

The generalizability of these findings should be investigated using different informants to rate the problem behaviors. Although different raters evaluating youths in the same context (e.g., school) generally demonstrate good interrater reliability, substantial variation in evaluations has been found among persons who observe youths' behaviors in different contexts (Achenbach, McConaughy, & Howell, 1987). Although assessment of problem behaviors in other settings should be explored, the school setting may be the most important context for investigating problem behavior–academic achievement relationships. Teachers with special education training and experience who spend large portions of the school day with their students may be particularly well suited to rate problem behaviors that are believed to interfere with academic performance. Teachers are also a common source of information about students who are being assessed for academic and behavioral problems. It is noteworthy that the teachers in our study were blind to the results of the individual standardized assessments of overall, reading, spelling, and arithmetic achievement, thus avoiding criterion contamination.

Attention problems and academic underachievement are important risk factors for many negative adult outcomes. Follow-up studies of children diagnosed with attention-deficit/hyperactivity disorder have found that as adults they have lower rates of educational attainment, occupational rank, job performance, self-esteem, and social skills. They also have higher rates of antisocial behavior, substance abuse (although the evidence is mixed), and ongoing symptoms of restlessness, impulsivity, and distractibility (Mannuzza & Klein, 1999). Adulthood outcomes of academic underachievement are similarly disheartening and include

lower occupational rank and job performance (Roth, Bevier, Switzer, & Schippman, 1996), increased mental health problems (Kaplan, Damphousse, & Kaplan, 1994), and decreased cognitive abilities (Ceci & Williams, 1997).

The high correspondence between attention problems and underachievement, paired with their poor prognostic indications, renders the development of appropriate detection and intervention strategies for these problems a cardinal goal. Because inattention seems to mediate the relationships between many problem behaviors and academic achievement, it should receive particular emphasis in assessment procedures for poorly performing students. Unlike some problem behaviors that can be observed readily (e.g., withdrawal, hyperactivity, aggression), inattention problems can be hard to detect and may be overlooked. Clinicians should therefore routinely evaluate inattention problems according to accepted assessment practices (e.g., Barkley, 1997). Although we are emphasizing careful assessment of inattention due to its central role in underachievement, we recognize the importance of evaluating other syndromes as well as contexts because they may deserve independent clinical or educational attention.

Although controversy exists regarding what treatments (or combinations of treatments) are most effective for attention problems and underachievement, most experts agree that long-term, multimodal interventions are best suited for addressing these conditions. Multimodal interventions typically involve teachers' and parents' using behavior modification strategies, enhanced instruction in academic skills, classroom accommodations, social skills training, and (in some cases) psychostimulant medication (Barkley, 1998; Hinshaw, 1992a). Given the intimate relationship between inattention and academic problems suggested by our results, their nature and treatment should receive continued focus from both researchers and clinicians.

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