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The implications of different developmental patterns of disruptive behavior problems for school adjustment

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Abstract

Based upon developmental models of disruptive behavior problems, this study examined the hypothesis that the nature of a child's externalizing problems at home may be important in predicting the probability of and nature of school adjustment problems at school entry. Parent ratings were collected for a sample of 631 behaviorally disruptive children using the Child Behavior Checklist. Confirmatory factor analyses revealed differentiated ratings of oppositional, aggressive, and hyperactive/inattentive behaviors at home. Teacher and peer nominations assessed school adjustment at the end of first grade. As expected from a developmental perspective, aggressive behaviors indicated more severe dysfunction and were more likely to generalize to the school setting than were oppositional behaviors. Hyperactive/inattentive behaviors at home led to more classroom disruption than did aggressive or oppositional behaviors. Co-occurring patterns of oppositional/aggressive and hyperactive/inattentive behaviors were more common than were single-problem patterns, and were associated with broad dysfunction in the social and classroom contexts. The results were interpreted within a developmental framework, in which oppositional, aggressive, and hyperactive/inattentive behaviors may reflect distinct (as well as shared) developmental processes that have implications for the home-to-school generalization of behavior problems and subsequent school adjustment.

Three distinct patterns of disruptive behavior problems are listed as diagnostic categories in DSM-IV (American Psychiatric Association, 1994): oppositional disorder, attention deficit/hyperactivity disorder, and conduct disorder. These problems often coexist and are associated with similar patterns of social–emotional maladjustment (Paternite, Loney, & Roberts, 1995). Although validated in clinic samples, it has been difficult to differentiate among these problem types in normative (nonclinic) samples and in samples of young (preschool) children, causing some researchers to question the utility and validity of making "narrowband" distinctions between various patterns of disruptive behavior problems in developmental research (Paternite et al., 1995). However, the

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frequent co-occurrence of these narrowband behavior problems may not indicate developmental isomorphism. That is, developmental relationships may be hierarchical (e.g., oppositional behaviors may serve as developmental precursors to aggressive behaviors) or transactional (for example, hyperactive/inattentive behaviors may increase the probability and stability of oppositional/aggressive behaviors; Hinshaw, 1987; Loeber & Lahey, 1989). If co-occurrence of behavior problems is the "rule" rather than the "exception" developmentally, the pattern or profile of problems shown may have significance for developmental prediction. In particular, the pattern of disruptive behavior problems shown during early childhood may reflect aspects of the developmental history that have significance for the prediction of future problems at key developmental transitions, such as when the child makes the transition from the family into the new socialization context of the school.

Consider first the relation between oppositional and aggressive behavior problems from a developmental perspective. Developmental theory and research suggest that disruptive behavior problems often emerge first in the form of oppositional behaviors, including noncompliance and dysregulated emotional outbursts during the preschool years (e.g., temper tantrums, refusals, whining, and pouting; Zahn–Waxler, Ianotti, Cummings, & Denham, 1990). These immature, oppositional child behaviors have been linked with dysfunction in the parent–child relationship and, in particular, with insensitive and nonresponsive caregiving and insecure attachment (Greenberg & Speltz, 1988; Keenan & Shaw, 1994). Perhaps in part because of the child difficulties with emotion regulation processes they represent and perhaps in part because of the negative parent–child interactions they reflect, oppositional behaviors in the preschool years predict to the later development of both internalizing and externalizing problems (Campbell & Ewing, 1990; Fischer, Rolf, Hasazi, & Cummings, 1984; Zahn–Waxler et al., 1990).

Early oppositional behaviors can serve as the first phase in an escalating process toward the development of aggressive behaviors, as they can set into motion a coercive cycle of interchanges between parents and children that can lead to the modeling, negative reinforcement, and escalation of aggression (e.g., Frick et al., 1993; Keenan & Shaw, 1994; Patterson, 1982). In contrast to the noncompliance and whining that characterize oppositional behaviors, these aggressive behaviors include physical and verbal acts intended to cause harm and pain to others, such as fighting, teasing, and destructive behavior. From a developmental perspective, the presence of high rates of aggressive behaviors in a child's repertoire (as opposed to oppositional behaviors alone) indicates a movement to a second and more severe phase of disruptive behavior problem development. Thus, children who have progressed to the display of aggressive behaviors may have experienced more exposure to aggressive models, more reinforcement for aggressive behaviors, and more extensive discordant interpersonal learning experiences than children who show only the "precursor" level of oppositional behavior (Lahey, Loeber, Quay, Frick, & Grimm, 1992).

Oppositionality and aggression are primarily interpersonal behaviors that function to express emotion and/or to attain social goals; interpersonal experiences, particularly parent–child relations, have emerged as one primary etiological factor for the development of these behavior problems. In contrast, hyperactive/inattentive behaviors, (which include inattention, distractibility, restlessness, and impulsive activity) may reflect the child's capabilities and approach to environmental exploration and task performance, as well as his or her interpersonal style. Although early parent–child relations may contribute to the development of later hyperactive/inattentive behaviors (Jacobvitz & Sroufe, 1987), child factors (attentional skills, activity level, and IQ/academic difficulties) also appear to play a critical role (Hinshaw, 1987; Loeber, Green, Lahey, & Stouthamer–Loeber, 1991; McGee, Williams, & Silva, 1985). Whereas developmental theories of aggression focus primarily on emotional dysregulation, hostile interper-

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sonal reasoning, and the learned propensity to react to interpersonal conflicts with escalating domineering and aversive behaviors (Keenan & Shaw, 1994; Patterson, 1982), developmental models of hyperactive/inattentive behavior problems often posit more general cognitive control and learning difficulties, including deficiencies in attentional control, task and goal oriented behavior, and behavioral inhibition (Barkley, 1990; Hinshaw, 1987).

Hyperactive/inattentive behaviors and oppositional/aggressive behaviors may have a transactional relationship developmentally. That is, hyperactive behaviors may increase a child's risk for becoming involved in negative parent–child exchanges and coercive family interactions which are associated with the development of oppositional and aggressive behaviors (Campbell, 1990; Loeber, 1982). Hyperactive behaviors may be stressful for parents and may elicit from parents frequent and increasingly punitive control attempts, as parents struggle to inhibit and direct their child's impulsive activity. Hence, although different factors may lead to the initial emergence of hyperactive/inattentive and oppositional/aggressive behaviors, the presence of child hyperactive problems may increase the likelihood of the later emergence of oppositionality and aggression. From a developmental standpoint, the presence of both hyperactive/inattentive and oppositional/aggressive behaviors in a child's profile of problems at home prior to school entry might indicate both deficits in the child's ability to regulate attention and engage in goal-oriented behavior (associated with hyperactive/inattentive behaviors) and deficits in emotion regulation along with the learning of coercive interpersonal strategies for managing relationships (associated with oppositional/aggressive behaviors).

One optimal time to examine the developmental consequences of different patterns of early behavioral development is as children make the transition into a new context—as they enter school. In general, correlations between parent ratings and teacher ratings are typically of low magnitude, averaging about $r = .27$, suggesting considerable situational specificity as children respond differently to the demands and characteristics of the home and school setting (Achenbach, McConaughy, & Howell, 1987). Attention to the pattern of home problems displayed by a child may enhance the prediction of problems from the home to school setting.

Although many studies have explored links between home and school behavior problems generally (e.g., Loeber & Dishion, 1984; Stanger & Lewis, 1993), these studies have typically examined broadband behavior problems rather than narrowband profiles. Examining the predictability of narrowband dimensions of externalizing behavior problems and specific behavior problem profiles across contexts may lead to a greater understanding of children's risk and the developmental course of various problem profiles (Drotar, Stein, & Perrin, 1995). Only one study to date has examined the proposition that different profiles of behavior problems at home may have differential predictability for school adjustment. McConaughy, Achenbach, and Gent (1988) used the Child Behavior Checklist (parent and teacher report forms) and direct observations to compare children with specific behavioral profiles across contexts. They found that children whose home behavior problem profiles were characterized by high rates of hyperactivity received the highest teacher ratings on both the internalizing and externalizing problem scales at school, in addition to increased academic problems, whereas children with profiles defined by peak elevations on delinquent behaviors at home showed elevated levels of aggression only at school. They also found that the presence of internalizing problems (depression and social withdrawal) at home predicted a decreased risk for school behavior problems, even when these internalizing problems occurred concurrently with high rates of aggressive behaviors. However, the McConaughy et al. study included a broad spectrum of grade-school children who varied in age. Many had been in school for several years, making it difficult to rule out the effects of previous school experiences on parent ratings of child behavior problems. Thus, the

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predictive validity of home problem profiles to school adjustment was not addressed in this study.

The Present Study

As the previous review suggests, developmental theory and research have focused on four different patterns of externalizing behavior problems in young children: oppositional behaviors, oppositional/aggressive behaviors, hyperactive/inattentive behaviors, and the combination of hyperactive/inattentive and oppositional/aggressive behaviors. These four patterns may reflect different developmental trajectories and, therefore, may have different implications for the generalization of problems from home to school settings and the quality of adjustment difficulties shown by children at school entry. In particular, it is hypothesized that oppositional behaviors (without concurrent aggression) primarily reflect dysfunctional parent–child relations. Although they may be a risk factor for later aggression, oppositional behavior at this age is predicted to be the least likely (relative to other patterns of externalizing problems) to generalize to school settings and affect school adaptation.

In contrast, children who show higher rates of aggressive behaviors at home may be relatively more likely to generalize these behavior patterns to the school setting, due to the higher level of "overlearning" and their more extensive reliance on coercive strategies to manage their interpersonal relationships. Children who display aggressive behavior (without hyperactivity) are thus likely to carry to school difficulties regulating emotion in interpersonal relations and a learned propensity to handle interpersonal conflicts with domineering aversive behavior, placing them at risk for aggressive relations with peers. The deficits postulated to accompany hyperactive/inattentive behavior at home (e.g., difficulties sustaining attention, difficulties organizing behavior to complete tasks) may place children at particular risk for maladaptation in the classroom (difficulties meeting the demands for behavioral constraint, concentration, and academic achievement), as well as peer difficulties due to poorly regulated social behavior.

Finally, it is hypothesized that those children who exhibit problem profiles that include elevated levels of both hyperactive/inattentive and oppositional/aggressive behavior have both self-regulatory deficits and learning histories supporting coercive interpersonal behaviors and, hence, are expected to show the broadest spectrum of school maladjustment, including disruptive classroom behavior, aggressive social behavior, and peer rejection (Moffitt, 1990).

To test these hypotheses, ratings of home and school behavior problems were attained for a large sample of at-risk children at the time of school entry. Parent ratings were acquired in the summer between kindergarten and first grade. To assess school adjustment, teacher and peer nominations were collected at the end of the first grade year. Confirmatory factor analyses revealed that parent and teacher ratings provided differentiated ratings of the three conduct problems of interest (e.g., oppositional, aggressive, and hyperactive/inattentive behaviors). Correlational and group comparison analyses were undertaken in order to test the hypotheses concerning the impact of these narrowband dimensions of behavior problems on children's adaptation to school. Externalizing behavior problems are more common among boys than among girls. Therefore, in the present study, gender was included as a factor in the design to determine whether gender differences would emerge in developmental predictions of the cross-setting generalization of oppositional, aggressive, or hyperactive behavior problems.

Method

Subjects

A sample of 631 behaviorally disruptive kindergarten target children and their parents were recruited as subjects. The children were screened for participation in a longitudinal intervention project designed to examine the developmental progression of conduct problems and the effectiveness of a preventive intervention program (Fast Track; Conduct Problems Prevention Research Group, 1992). The first

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two cohorts of subjects were included in the present study. Subjects were sampled from selected schools in four areas of the country, each representing different cross-sections of American culture. The areas included Durham, NC, a small city in which the public school system served a large low- to middle-SES, African American population, Nashville, TN, a moderate-sized city in which schools were selected that served a mix of low- to middle-SES African American and Caucasian families, Seattle, WA, a moderate sized city in which schools were selected that served a low- to middle-SES, ethnically diverse population, and Central Pennsylvania, a rural area in which three school districts were selected that served low- to middle-SES Caucasian families. Chidren were diverse on race, with 49% minority (predominantly African American) and 51% Caucasian families, reflecting the ethnic diversity of the populations at the four sites. Gender ratios in the high-risk sample reflected epidemiological data that document a higher prevalence of disruptive behavior in boys than girls—74% boys and 26% girls. The mean age of children in the sample was 6.45 ($SD = .50$).

A two-step screening process was used to identify the children (see Lochman & the Conduct Problems Prevention Research Group, 1995, for more details). In the spring, all of the kindergarten children in the 55 participating elementary schools at the four sites of the Fast Track project were screened with an abbreviated version of a teacher rating form (the TOCA-R; Werthamer–Larson, Kellam, & Wheeler, 1991) which assessed a range of conduct problems at school. Consenting parents of children who scored in the top 35% in terms of conduct problems at school were then called and parent phone interviews were conducted. A 24-item scale of conduct problems (the Parent Screen) was drawn from the aggression scale of the Child Behavior Checklist (Achenbach, 1991) and the Revised Problem Behavior Checklist (Quay & Peterson, 1987) and was used as the second screening instrument. Based upon the average teacher and parent problem scores (combined), 160 behaviorally disruptive children were then chosen for either the intervention or control condition at each site (approximately 80 in each cohort at each of four sites).[1] The selected sample represented the top 10% of the sampling population in terms of their cross-situational problem behavior ratings (teacher and parent combined).

Of the 631 children who were originally identified for the high-risk sample at the end of kindergarten, first grade teacher ratings were available for 600 (95%) and first grade peer nominations were available for 569 (90%). Hence, there was very little attrition in the sample from the time of identification to the time of school adjustment assessment 1 year later.

In addition to the high-risk sample that is the focus of this study, comparable parent and teacher ratings were available at kindergarten for a normative sample of 387 children (approximately 100 children from each site). These children were selected to represent the sample at each site along the dimensions of ethnicity, gender, and kindergarten teacher ratings of behavior problems. Comprehensive teacher ratings of school adjustment were not available for this normative sample at the end of first grade; hence, they were not included as subjects in this study. However, the kindergarten parent and teacher ratings were used as a normative base for estimating population base rates for behavior problems and for assessing the severity of behavior problems among children in the high-risk sample.

Measures

In this study, parent ratings were drawn from the initial pretreatment summer interview of the primary caregiver (usually the mother) of

1. Half the high risk sample in this study received the Fast Track intervention program during their first grade year (October–April). Preliminary analyses revealed that the intervention did not have a significant impact on the teacher or peer nominations of oppositional, aggressive, or hyperactive behavior used as dependent variables in this study, nor were there differences between the intervention and control groups in terms of the types or severity of child home behavior prior to first grade (all $ps < .10$). Given evidence that intervention had not affected the variables studied here, all children in the high-risk sample (intervention and control conditions) were included in the present analyses.

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two high-risk cohorts of children which took place in the summer before children entered first grade. Biological mothers provided ratings for 86% of the sample, biological fathers for 5% of the sample, grandmothers for 3% and grandfathers for 2% of the sample. Other types of raters (stepparents, adoptive parents, or other guardians) provided ratings for less than 1% of the sample. First grade teacher and peer nominations were collected 9–12 months after the parent ratings, at the end of the first grade year.

Assessment of narrowband dimensions of conduct problems. The problem lists of the Child Behavior Checklist-Parent Report Form (CBC-PRF) and the Child Behavior Checklist-Teacher Report Form (CBC-TRF; Achenbach, 1991) each contained a list of 113 behavior problem items, which parents or teachers rated on a three point scale (0 = *not true* to 2 = *very true* or *often true*). Parents and teachers were asked to rate behaviors that had been problems during the past 6 months. Although a standardized scoring system was developed for these measures based on factor analyses of large samples of children aged 6–12 years (Achenbach, 1991), this standard scoring system did not provide a clear discrimination between oppositional, aggressive, and hyperactive behavior problems. In addition, overt aggression was discriminated from covert delinquency—a distinction which is particularly important in later years, but may be less useful at ages 5–6 years when covert antisocial behaviors have very low base rates. In contrast, the distinction between aggressive and oppositional behaviors, which may be more relevant to the description of conduct problems at the 5–6 years of age level, was not made in the 1991 scoring system. To develop a scoring system for the CBC-PRF and CBC-TRF that was more suited to the purposes of this study, conduct problem items were submitted to a confirmatory factor analysis to determine whether the narrow-band dimensions of interest in this study (e.g., oppositional, aggressive, and hyperactive/inattentive behaviors) would emerge in both teacher and parent perceptions at this age level. The details and results of these factor analyses are provided in the Results section.

Peer nominations. At the end of the first grade year, children in all participating classrooms who received parental permission (75–80% in most classrooms) were interviewed individually. After making sure that children were acquainted with each of the other children on the classroom roster, the interviewer asked children to list the classmates they liked the most and those they liked the least. Unlimited nominations were accepted. In addition, children were asked to nominate classmates who they felt fit the following descriptions: "Some kids start fights, say mean things and hit other kids" (aggressive) and "Some kids get out of their seat a lot, do strange things, and make a lot of noise. They bother people who are trying to work" (disruptive/hyperactive). For the present study, "like most" and "like least" nominations were standardized within classroom. The difference between these scores (LM–LL) was used as an index of social preference, and restandardized within classroom. For the two behavior problem items, the number of nominations received was divided by the number of raters and then standardized within class.

Procedures

During a summer home visit, an interviewer read through the entire CBC-PRF problem checklist with the primary caregiver, noting the caregiver's responses. Rating forms were left with first grade teacher in the spring (April–May); teachers completed the forms on their own and then returned them to the project. Both parents and teachers received monetary compensation for their ratings. Peer nominations, as noted above, were collected during individual interviews held at school during the spring of first grade.

Results

Preliminary analyses

To provide a clear discrimination among the narrow-band dimensions of oppositional, aggressive, and hyperactive/inattentive behaviors, a confirmatory factor analysis was conducted using items from the CBC-PRF. The DSM-IV was used as a guideline to create

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Table 1. *Factor loadings and fit indices for hyperactivity, overt aggression, and oppositional behavior for both parent- and teacher-rated behavior problems*

Factors	Parent Loading	Teacher Loading
Oppositional		
3. Argues a lot	.56	.71
22. (23)[a] Disobedient	.58	.74
86. Stubborn, irritable	.61	.74
87. Sudden changes in mood or feelings	.49	.61
88. Sulks a lot	.50	.68
95. Temper tantrums	.57	.76
109. Whining	.50	.33
Aggression		
16. Cruelty and bullying	.60	.82
20. Destroys own things	.45	.52
21. Destroys others things	.52	.65
43. Lying or cheating	.53	.60
37. Gets in many fights	.59	.78
57. Physically attacks people	.53	.77
94. Teases a lot	.54	.63
97. Threatens people	.54	.76
90. Swearing	.38	.55
Hyperactive		
8. Can't concentrate	.44	.46
10. Can't sit still, restless	.55	.69
41. Impulsive, acts without thinking	.56	.73
93. Talks too much	.47	.63
104. Unusually loud	.55	.66

[a]Disobedient was used as an item to reflect the level of disobedience in each context. Item 22 (Disobedient at home) was used in the parent analysis, whereas Item 23 (Disobedient at school) was used in the teacher analysis.

theoretically distinct scales. Items on the CBC-PRF that reflected the same content as the various criterion for ODD, CD, and ADHD were used in the analyses (see items listed in Table 1). Items that were very atypical at this age range (frequencies less than 5% in the high risk sample) were not included ("runs away from home," "alcohol/drug use," "tardy," and "truant"), as it was anticipated that these very low base rate behaviors were not characteristic of the disruptive behavior problems of children in this age range.

The three subscales were submitted to a confirmatory factor analysis using maximum likelihood estimation with a three factor solution specified (using SAS, Proc Calis, 1990). Four items associated with the diagnosis of Conduct Disorder in the DSM-IV were dropped from the aggression scale because they reduced the fit of the model ("cruelty to animals," "fire-setting," "stealing at home," and "stealing outside of the home"). Previous investigators have suggested that these covert antisocial behaviors should be discriminated from overt aggression and, at later ages, may become an important dimension of antisocial behavior (Loeber & Lahey, 1989). However, at ages 5–6 years, these covert antisocial behaviors are rare and may not yet be stable or predictive (Gersten, Langner, Eisenberg, Simcha–Fagan, & McCarthy, 1976); hence, they were deleted from further analyses in the present study.

The final analysis produced a model with a good fit to the data, $\chi^2(182) = 453.68$, $p < .01$, goodness of fit index = .94, Bentler Bonett = .91. With a large sample size such as this one, a significant χ^2 may emerge, and fit indices must be examined in order to evaluate the fit of the model (Bentler & Bonett, 1980).

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Table 2. *Correlations among narrowband dimensions of behavior within and between rater*

	Behavior Problems	
Source	Aggressive	Oppositional
Parent Ratings		
Hyperactive	.50***	.45***
Aggressive		.55***
Teacher Ratings		
Hyperactive	.65***	.63***
Aggressive		.71***

	Parent Ratings		
Teacher Ratings	Oppositional	Aggressive	Hyperactive
Oppositional	.03	.10*	.12*
Aggressive	.08	.22*	.16*
Hyperactive	–.03	.11*	.21*

Note: Correlations that differ by .11 are significantly different using Fisher's *Z* transformation at $p < .05$.
*$p < .05$. ***$p < .001$.

The constructs that emerged from this analysis reflected distinct dimensions of behavior problems at this age. The items and factor loadings are presented in Table 1.

The primary goal of this study was to investigate the relation between narrow-band behaviors across contexts (e.g., home to school). Therefore, the same items on the CBC-TRF that were used in the CBC-PRF analysis were submitted to a confirmatory factor analysis in order to validate the independence of these behavioral dimensions at school. Although the CBC-TRF provided additional items to assess some constructs (e.g., items focused on inattention and poor school work), these items were not included as their inclusion might have limited the interpretability of cross-context comparisons. The analysis produced a model with a moderate fit to the data, $\chi^2(181) = 896.84$, $p < .01$, goodness of fit index = .86, BB = .89. Although the fit indices for the CBC-TRF were not as high as those using the CBC-PRF, the analysis suggested that the dimensions of oppositional, aggressive and hyperactive/inattentive behaviors could be differentiated in the school context at this age. The factor loadings for the CBC-TRF items are also included in Table 1.[2]

Scores were summed across items to create scale scores for each of the three factors in both contexts. To examine the correlations among scales within each type of rater, bivariate correlations were conducted and are presented in Table 2. Although all the scales were related, correlations did not exceed .55 for the parent ratings, suggesting moderate independence of these behavior problems in this sample. Correlations ranged from .65–.71 for teacher ratings of oppositional, aggressive, and hyperactive behaviors, which are in the range reported by other investigators (McGee et al., 1985). The magnitude of correlations across contexts (home to school) showed some specificity, with hyperactive/inattentive

2. Although both CFAs produced a significant χ^2, it is common for large sample sizes to distort the χ^2 even though the model may fit the data (e.g., Bentler & Bonett, 1980). In this study, Bentler's Comparitive Fit Index was reported and was used as an indication of goodness of fit. This CFI controls from non-normality of data and is more sensitive to sample size (Bentler, 1990). Additionally, acceptable ratios of χ^2 to *df* have been discussed ranging from 2 : 1 to 5 : 1 for large data sets (Wheaton, Muthen, Alwin, & Summer, 1977). Our CBCL model approximately meets the 2 : 1 criteria, whereas the TRF χ^2 : *df* ratio is less that 5 : 1.

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Table 3. *Means and standard deviations of behavioral dimensions in both the high-risk and normative sample*

Behavior	High Risk	Normative
Parent-rated		
Oppositional	5.84 (2.78)	4.28 (2.82)
Hyperactive	4.69 (2.25)	3.09 (2.33)
Aggressive	4.14 (3.04)	2.35 (2.67)
Teacher-rated		
Oppositional	5.13 (3.99)	2.67 (3.44)
Hyperactive	4.89 (2.99)	2.87 (2.94)
Aggressive	5.11 (4.83)	2.35 (3.74)

Note: Standard deviations are in parentheses.

behavior at home correlating with hyperactive/inattentive behavior at school and aggression at home correlating with school aggression. In particular, aggression at home was significantly more strongly associated with aggression at school than any other school behavior. Oppositional and hyperactive/inattentive behaviors did not differ in their predictability to the narrowband school behavior problems. The means and standard deviations for parent and teacher rated behavior problems for the high-risk and the normative samples are shown in Table 3.

Predictors of teacher and peer rated school behavior problems

To examine the predictability of the three narrowband dimensions of behavior at home to the school context, a series of standard regression analyses were conducted and are presented in Table 4. Standard regression analyses were used in order to examine the independent contributions of each narrowband while controlling for other behaviors of interest. In addition, gender was included in the model to determine whether it was associated directly with the pattern of behavior problems exhibited at school and whether it served as a moderator interacting with the patterns of home behavior to predict school behavior problems in different ways for boys and girls.

In preliminary analyses, gender was included in the model as a main effect and as an interaction term with each behavior. As anticipated, gender had a significant main effect, with boys exhibiting higher rates than girls of all problem behaviors at school (all $ps < .05$). General linear F tests (Neter & Wasserman, 1974) comparing the main effect model with a model including interactions were conducted in order to assess whether the models significantly differed, that is, whether interactions between gender and behavior made significant contributions to the model beyond the main effects. Only one comparison was significant, and that was the interaction between hyperactivity at home and gender in the prediction of peer-rated aggression, which was stronger for girls than boys, $F(7, 565) = 4.53$, $p < .05$. Thus, although girls showed fewer behavior problems at school than did boys, in general the pattern of home behaviors predicting to school adjustment did not differ for boys and girls. Girls who were hyperactive at home (compared to similar boys) were more likely to be viewed by peers as aggressive at school. No other gender by home behavior patterns predicted to school adjustment.

Across gender, aggressive behaviors at home showed specific prediction effects, predicting teacher and peer rated aggression at school. Hyperactive/inattentive home behaviors predicted a broader range of school problems, including teacher rated oppositional behavior and peer rated low social preference, in addition to teacher and peer rated hyperactive behaviors. In contrast, oppositional behaviors at home did not contribute any unique variance toward the prediction of school problems in this high risk sample. In fact, the only significant finding for the differential prediction of school problems from various narrow-band behavior problems in this high risk sample suggested that oppositional behavior (when considered in the context of aggressive and hyperactive/inattentive behaviors) reduced the risk for school hyperactivity ($SB = -.19$). These findings suggest that aggressive and hyperactive/inattentive behaviors at home have distinct value for predicting school behavioral maladjustment, predicting to elevated social aggression and elevated classroom disruptive behaviors, respectively. Relative to these developmentally more severe behavior problems, home oppositional behaviors at this

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Table 4. *Standard regression analyses predicting school behaviors at the end of first grade from oppositional, hyperactive, and aggressive behaviors rated by parents postkindergarten*

	Teacher-Rated School Behavior (*F* Value; *df* = 3,601)					
	Oppositional		Aggressive		Hyperactive	
Home Behavior	*F*	*SB*	*F*	*SB*	*F*	*SB*
Oppositional	—	—	—	—	12.59**	–.19**
Hyperactive	8.50*	.10*	—	—	26.96**	.25**
Aggressive	—	—	30.78**	.22**	—	—
Total R^2		.02		.06		.07
	Peer-Rated School Behaviors (*F* Value; *df* = 3,570)					
	Peer Pref.		Aggressive		Hyperactive	
Oppositional	—	—	—	—	—	—
Hyperactive	13.77**	–.12**	—	—	5.16*	.11*
Aggressive	—	—	27.85**	.22**	15.90**	.12*
Total R^2		.03		.05		.04

Note: SB = Standardized Beta Coefficient.
*$p < .05$. **$p < .01$.

age appear less likely to affect school adjustment. Given the moderate to high intercorrelations between teacher ratings of behavior, these results are supportive of the specificity of home behaviors to school problems.

Group comparisons in school problem severity

The regression analyses provided some support for the hypotheses, but failed to address two issues: the risk for school maladjustment for children with oppositional problems (only) at home relative to a normative sample as well as relative to a sample of high-risk children with other behavior problems, and the effects of multiproblem profiles of home behavior problems on school adjustment. To address these questions, four groups of children with different profiles of home behavior problems were identified, representing distinct subgroups within the larger high-risk sample. To create the groups, children were designated as "high" on a given home-based dimension of conduct problems if their score exceeded 1 standard deviation relative to the normative sample. The 1 standard deviation cutoff did not limit these groups to those children with clinically significant behavior problems but did identify children who had significant elevations of various home behavior problems and thus enabled us to examine the school problems of children with specific patterns of elevated home problems identified in the developmental literature. All other children who scored below this 1 standard deviation relative to the normative sample were considered "low" on that problem dimension. Using these criteria, 302 children (49% of the high-risk sample) fell into one of the four target groups: (a) oppositional only, not aggressive or hyperactive (n = 31, 5% of the sample), (b) aggressive or aggressive/oppositional only, not hyperactive (n = 65, 10% of the sample), (c) hyperactive/inattentive only, not oppositional or aggressive (n = 77, 12% of the sample), and (d) aggressive or aggressive/oppositional and hyperactive/inattentive (n = 124, 20% of the sample).[3] Other children in the high risk sample had elevated scores but

3. Children were classified into this group if their aggression and hyperactive-inattentive scores exceeded 1 standard deviation relative to the normative sample. The majority of children in this group also had elevated scores for oppositional behavior.

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either did not exceed 1 *SD* on any of these home problem dimensions or did not fit into any of the four problem patterns listed above for whom specific developmental predictions could be made.

Chi-square analyses revealed no significant differences in gender representations across groups; equivalent ratios of boys to girls characterized each problem profile grouping, $\chi^2(3, 302) = 3.08$, $p > .10$. Hence, for further analyses, boys and girls were combined.

Comparisons of the parent ratings on hyperactivity showed no differences between children who were hyperactive/inattentive alone and those who were in the multiproblem group (hyperactive/inattentive and aggressive/oppositional), $F(3, 298) = 1.81$, $p > .10$. However, children in the multiproblem group had higher rated parent aggression scores than children who were only aggressive, $F(3, 298) = 7.63$, $p < .01$. Hence, whereas children in the multiproblem group differed from children in the hyperactive/inattentive group only in terms of their greater diversity of behavior problems (e.g., aggression as well as hyperactive/inattentive behaviors), the multiproblem group differed from the aggressive group both in terms of the diversity of their behavior problems and in terms of the severity of their aggressive problems at this age.

To examine differences in the school problems experienced by children who showed each of the four patterns of home problems, one-way analysis of variances (ANOVAs) were conducted using each of the six measures of school adjustment as dependent variables (teacher rated oppositional behavior, teacher rated aggression, peer rated aggression, teacher rated hyperactive behaviors, peer rated hyperactive behaviors, and peer social preference).

Groups differed in the degree to which they exhibited aggressive behavior problems at school, as rated by peers, $F(3, 267) = 3.16$, $p < .05$, and as rated by teachers, $F(3, 285) = 2.94$, $p < .05$. As shown in Table 5, post hoc comparisons revealed that children who showed combined problem patterns of aggressive and hyperactive/inattentive behavior at home were rated by peers as significantly more aggressive than children who showed oppositional behavior only at home. The other two groups of children (aggressive only, hyperactive/inattentive only) received intermediate ratings. Post hoc comparisons conducted on teacher aggression ratings revealed that children who showed aggressive behavior at home (with or without comorbid hyperactive behavior) were significantly more aggressive at school than were children who were oppositional (only) at home; means and standard deviations are shown in Table 5. Apparently, relative to oppositional behavior or hyperactive/inattentive behaviors alone, the display of aggressive behavior at home predicted a greater likelihood of the emergence of problems with social aggression at school.

When teacher and peer nominations of hyperactive/inattentive behavior at school were considered, significant group differences emerged on both measures, $F(3, 285) = 4.95$ for teachers and $F(3, 267) = 4.28$ for peers, both ps $< .01$. Post hoc comparisons revealed that, for both types of raters, children who exhibited hyperactive or multiproblem (combined hyperactive and aggressive) behavior problems at home were significantly more likely than children who experienced oppositional behaviors at home to show elevated hyperactive/inattentive behaviors at school. Children with aggressive problems at home scored in the intermediate range on peer nominations of hyperactivity but scored significantly below children with home hyperactive problems on teacher ratings of hyperactive/inattention. The presence of hyperactive/inattentive behaviors at home then, relative to oppositional or aggressive behaviors at home, indicated an increased risk for the emergence of hyperactive/inattentive and disruptive behavior problems at school. (Group means and standard deviations are presented in Table 5.)

Significant group differences also emerged on peer social preference ratings, $F(3, 267) = 4.01$, $p < .01$. Children who showed a comorbid pattern of aggressive and hyperactive behavior at home experienced the highest level of peer relation problems at school, showing social preference ratings in first grade that were significantly lower than those of children who were oppositional or aggressive at home. Children who exhibited hyperactive behaviors at home had social preference scores that were intermediate in level. Two factors

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Table 5. *Mean levels of school adjustment problems for children showing four patterns of home behavior problems*

	Pattern of Home Problems				
School Problem	Oppositional ($n = 31$)	Aggressive ($n = 70$)	Hyperactive ($n = 77$)	Comorbid ($n = 124$)	*F* Value ($df = 3,267$)
Oppositional					
Teachers	0.44 (0.91)	0.80 (1.25)	0.92 (1.22)	0.93 (1.13)	1.60
Aggression					
Teachers	0.37 (1.09)[b]	1.05 (1.55)[a]	0.76 (1.31)[ab]	1.12 (1.31)[a]	2.94*
Peers	0.59 (1.16)[b]	1.09 (1.40)[ab]	0.68 (1.18)[ab]	1.18 (1.34)[a]	3.16*
Hyperactive					
Teachers	0.31 (0.92)[c]	0.66 (1.14)[bc]	1.07 (1.01)[a]	0.91 (0.97)[ab]	4.95**
Peers	0.30 (1.12)[b]	0.78 (1.19)[ab]	1.06 (1.01)[a]	1.20 (0.97)[a]	4.28**
Peer preference					
Peers	–0.34 (1.02)[a]	–0.42 (0.87)[a]	–0.63 (0.95)[ab]	–0.86 (0.96)[b]	4.01**

Note: Teacher rated means have been standardized in relation to those of the normative sample. Peer nominations are standardized by the entire school. Standard deviations are in parentheses. Means with different superscripts are significantly different using Duncan's post hoc comparison.
*$p < .05$. **$p < .01$.

may account for the extreme social difficulties of children in the multiproblem group. First, the combination of self-regulatory skill deficits and aggressive interpersonal behaviors that characterize children who display both hyperactive and aggressive behaviors in the family context may be particularly detrimental to the establishment of positive peer relations in school. In addition, the greater severity of the home aggressive behavior of children in this group (relative to children in the single-problem aggressive group) may reflect more extreme social hostility and more severe problems overall. (Group means and standard deviations are presented in Table 5.)

Degree of risk associated with various problem profiles

The group comparisons described above provided information about the mean levels of problems experienced by children with different home problem profiles. Elevated group means could indicate severe problems among some group members but do not indicate the number of children in each group who show significant problems nor the probability of risk for school problems associated with various home problem profiles. Hence, in a second set of analyses, children were identified as showing significant elevations of various problems at school if their school problem scores exceeded 1 standard deviation (based upon the normative sample data collected at the end of kindergarten and peer nominations collected at the end of first grade). Then, the proportion of children in each home problem profile group who exhibited significant elevations on each school problem was calculated. The odds that a particular home problem profile predicted a school problem were compared to the odds of showing that school problem for children in two comparison groups: children in the normative sample and children in the high risk sample who did not display rates of home behavior problems higher than 0.5 standard deviation on any of the narrowband dimensions studied. The *z* test was applied to determine the degree to which knowledge about home problem profile significantly improved the prediction of a school problem (e.g., whether the odds were significant; Gottman, 1979).

Table 6 shows the rates of various school problems experienced by children in the high risk sample who represented different home problem pattern subgroups. Superscripts indicating significant differences relative to the

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Table 6. *Proportion of children in four home problem groups who show aggression, hyperactive behaviors, or peer rejection at school*

	Pattern of Home Problems (%)			
School Problem	Oppositional ($n = 31$)	Aggressive ($n = 70$)	Hyperactive ($n = 77$)	Comorbid ($n = 124$)
Oppositional				
Teachers	29[a]	34[a]	38[a]	38[a]
Aggression				
Teachers	26[a]	37[ab]	32[a]	46[ab]
Peers	26[a]	41[ab]	30[a]	48[ab]
Hyperactive				
Teachers	26[a]	43[a]	60[ab]	50[ab]
Peers	13	34[ab]	47[ab]	47[ab]
Peer relations				
Rejection	23[a]	21[a]	29[a]	37[ab]

[a]The conditional probability is significantly higher than the unconditional probability in the normative sample. [b]The conditional probability is significantly higher than the unconditional probability in the high risk sample.

normative sample show that the presence of any of the home problem profiles led to significantly increased risk for school adjustment problems. In fact, the odds of having a school problem differed significantly from normative sample rates in all but one case—oppositional behaviors only at home did not place children at increased risk for peer-rated hyperactive behaviors. In all other cases, elevated levels of any of the disruptive behaviors studied at home increased risk for the emergence of disruptive behaviors and peer relation problems at school, including the profile of oppositional behavior alone (see Table 6).

Differences in risk for school adjustment problems also emerged among children in the high risk sample who showed various patterns of home problem profiles. By definition, school problems were evident at higher rates in the high-risk than in the normative sample, with rates ranging from 23% (peer rejection) to 38% (elevated teacher hyperactive behavior ratings). When the prediction to school aggression was considered, children who showed aggression or a combined profile of hyperactive and aggressive behaviors at home were significantly more likely than children with other problem profiles to exhibit elevated levels of aggression at school, by both teacher and peer report. When the prediction to school hyperactive behavior was examined, children who were either hyperactive at home or hyperactive and aggressive at home were significantly more likely than other high risk children to exhibit elevated levels of hyperactive behaviors in the classroom (by teacher report). Risk for elevated levels of peer-rated hyperactive behaviors was significant across all groups except for children with elevated oppositional behaviors alone at home. Finally, risk for peer rejection was significantly greater for the group of children who showed combined profiles of aggressive and hyperactive behaviors at home than for other groups of high risk children.

In summary, among children at risk for school adjustment problems, the combined profile of hyperactive/inattentive and oppositional/aggressive behaviors exhibited at home indicated particularly high risk for multiple behavioral problems at school, including aggressive and hyperactive behaviors and peer rejection. Problem profiles including elevations on hyperactive behaviors only were associated with teacher and peer rated hyperactive behaviors, whereas problem profiles with elevations on oppositional/aggressive behaviors only were associated with teacher and peer nominations of aggression. Although oppostional children were at-risk compared to

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the normative sample, they showed less risk for school problems than other children in the high-risk sample.

Discussion

Disruptive behavior problems are the most common problems of childhood. They are stable and predictive of a number of negative outcomes, and hence have attracted the attention of developmental researchers and preventive interventionists (Kazdin, 1987).

Children who show cross-situational conduct problems often have more severe and stable behavioral difficulties than do children who show problems in one setting only (Loeber, 1982; Loeber & Dishion, 1984; Patterson, 1982; Schachar, Rutter, & Smith, 1981). Therefore, understanding factors that may increase the likelihood that disruptive behaviors will generalize from home to school settings has become an important goal. The previous work of McConaughy et al. (1988) suggested that the nature of a child's behavior problems at home may affect the likelihood of generalization to school. Indeed, developmental theory and research provided a basis for specific predictions about the ways in which different patterns of home behavior problems might reflect different degrees and different kinds of developmental deficiencies or distortions, which in turn, might result in differential patterns of cross-setting generalization.

In the present study, a large high-risk sample was used to examine developmental predictions about the home-to-school transmission of various patterns of narrowband behavior problems. The high-risk sample provided a large enough representation of different patterns of disruptive behavior shown in home settings to enable comparative analyses of predictability to school. The results supported the developmental predictions. Despite the high correlations among teacher ratings of narrowband behavior problems, home behaviors differentially predicted school problems. In particular, children who showed oppositional behavior (only) at home, although at elevated risk for school problems when compared to the normative sample, were less likely than children with other patterns of disruptive behavior to show cross-setting generalization of problems to school. Aggressive behavior problems showed a pattern of specific cross-situational relations, as they were associated with both teacher and peer rated aggression. In contrast, hyperactive behaviors at home predicted teacher and peer rated hyperactive behavior problems, as well as teacher rated aggression and low peer rated social preference.

These findings should not be interpreted as an indication that oppositional behavior and parent–child conflict (even when not accompanied by aggressive and hyperactive behaviors) do not have important implications for later child development and adjustment. However, they do indicate that other behavioral characteristics of the child at the time of school entry, particularly hyperactive and aggressive behavior problems, may be more critical determinants of school behavioral and social adjustment than oppositional behavior.

The presence of hyperactive/inattentive behaviors at home was particularly detrimental to behavioral adjustment in the school classroom setting where children faced significant demands for behavioral constraint and focused attention. Indeed, by both teacher and peer report, children who were hyperactive/inattentive at home were at increased risk (relative to children who showed oppositional or aggressive behaviors at home) for disruptive and hyperactive/inattentive behavior in the classroom. Hyperactive children have been characterized as exhibiting deficits in the learning and internalization of rule-governed behavior and demonstrating a corresponding dependence on external structure and feedback for behavioral control (Barkley, 1990). In addition, the difficulties inhibiting motor activity and focusing attention and the lower IQ and academic deficits associated with hyperactive behaviors may make the setting and expectations of the classroom particularly challenging for these children. Academic struggles may increase the frustrations and the demandingness of the school situation for hyperactive children (Hinshaw, 1994).

The presence of both hyperactive/inattentive and oppositional/aggressive problems in

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a child's behavioral repertoire at home may indicate a greater degree of child regulatory skill deficits and maladaptive learning experiences than hyperactive/inattentive behavior alone. Developmentally, transactional influences may increase the risk for oppositional and aggressive behaviors among children who are hyperactive/inattentive. In this study, children were almost twice as likely to show combined problem patterns of oppositional/aggressive and hyperactive/inattentive behaviors than they were to show aggressive or hyperactive behaviors alone. Hyperactive/inattentive behaviors may increase a child's risk for becoming involved in negative parent–child exchanges and coercive family interactions which are associated with the development of oppositional and aggressive behaviors (Campbell, 1990). In this study, children who showed combined problem profiles that included hyperactive/inattentive and oppositional/aggressive behaviors exhibited elevated rates of both aggressive and hyperactive behaviors at school, as well as significant peer relation problems. In almost all of the problem areas studied, the comorbid problem profile was associated with significantly higher probabilities of risk for maladjustment at school than were any of the single problem patterns. Perhaps the combination of the difficulties conforming to the behavioral constraints and academic demands of the classroom (associated with hyperactivity) along with emotion dysregulation and a learned propensity to respond to frustration or interpersonal conflict with hostile behavior (associated with aggression) contribute to the emergence of frequent coercive exchanges with teachers and peers at school that may lead to escalations in school conduct problems in a manner similar to that postulated for family interactions (Patterson, 1982). In addition, the frustration and experience of peer rejection and nonresponsive or hostile peer treatment may serve to elicit or exacerbate hostile behavior at school for these children (Coie, 1990).

Previous researchers have documented the increased developmental risk associated with multiple and diverse patterns of disruptive behavior problems (Loeber, 1982). The additional risks for social and school maladjustment for children who show aggressive behaviors and hyperactive/inattentive behaviors (as compared to those children who show hyperactive/inattentive behaviors alone) have also been documented previously (Hinshaw, 1987). However, whereas previous investigators have questioned whether distinctions between narrowband dimensions of disruptive behaviors can be made prior to middle childhood and whether these distinctions are useful in developmental research on normative (as opposed to clinical) populations, the present study suggests that examining the pattern of narrowband disruptive behaviors shown by young children may have important implications for predictions about cross-setting generalization, developmental course, and identification of at-risk children for preventive intervention. Given different developmental contributions, prevention programs may need to target different skills deficits for children who show oppositional or aggressive versus hyperactive/inattentive behaviors, and assessment procedures may need to include attention to the presence of comorbid patterns of externalizing problems in sample selection and program evaluation.

Interpretation of the present results should take into consideration several limiting features of the study design. First, the sample studied here was one already identified as high-risk because of the presence of behavior problems in home and school settings. The availability of a broad range of children with elevated rates of home and school behavior problems in the present sample made it possible to examine the patterns of cross-setting generalizability associated with various problem profiles; thus, the sample used was selected and not representative of the population. Standardization of the behavioral dimensions by the normative sample and normative comparisons highlighted group differences. Additionally, some children were involved in an intensive intervention program designed to prevent the cross-setting stability of behavior problems, which may have had some impact on home to school correlations of behavior problems.

A second limitation of this study was the

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use of a single parent-rated assessment of child adjustment at home. It is possible that rating biases due to a reliance on maternal reports of child behavior problems may limit the generalizability of these findings (Hops & Seeley, 1992). In addition, the assessment of home adjustment included only one time point. It is possible that the developmental phase of measurement may affect the predictability of certain conduct problems. For example, although oppositional behavior at the time of school entry as studied here did not contribute as much as other behavior problems to the prediction of elevated school problems, it is possible that such behavior plays an important role earlier in the developmental course of disruptive problems. Future research that includes multiple time points of home and school behavior assessment may be useful in examining both the earlier developmental precursors to home behavior problems that affect school adjustment and the later course of transactional relations between school and home behavior problems. That is, reciprocal developmental transactions may emerge over time, as the quality of a child's school adjustment may contribute to changes in that child's behavior at home.

Finally, this study focused on characteristics of the child, specifically the quality of the child's behavior problems, in the prediction of school behavioral and social adjustment. A number of characteristics of the home and school context may also be important in determining the cross-setting generalization of child conduct problems and the quality of the child's adjustment to school, including such factors as the availability of social support from peers, parents, and siblings (Ladd, 1990), the sorts of teacher interactions and responses the child experiences, and the nature of the peer environment (Werthamer–Larson, Kellam, & Wheeler, 1991). Gender differences may also impact adjustment. Although gender did not moderate correlations between home and school behavior problems in this study, the higher proportion of males to females in our sample and the limited strength of interaction terms in regression models may have attenuated gender differences. Gender differences warrant further exploraiton in future research (McClelland & Judd, 1993). Future research is also needed to help clarify the relations that may exist between the behavioral characteristics of the child and contextual features that contribute to school adjustment and to further explore the factors that may affect the generalization of conduct problems from home to school settings.

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