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Source-specific Oppositional Defiant Disorder among Inner-city children: Prospective Prediction and Moderation

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Abstract

We examined prospective prediction from parent- and teacher-reported Oppositional Defiant Disorder (ODD) symptoms to parent-reported ODD, Conduct Disorder (CD), Major Depressive Disorder (MDD), and Generalized Anxiety Disorder (GAD) symptoms and whether child executive functioning abilities moderated these relations among an urban, low income sample of first-third grade children (*N*=87). Time 1 parent-reported ODD predicted each Time 2 outcome. Time 1 teacher-reported ODD predicted Time 2 CD and MDD symptoms. After controlling for Time 1 co-occurring symptoms, only prediction from Time 1 teacher-reported ODD to CD and MDD symptoms remained significant. Child executive functioning abilities moderated relations between Time 1 parent-reported ODD and Time 2 ODD, and Time 1 teacher-reported ODD and Time 2 CD and MDD. Among children with better executive functioning abilities, higher Time 1 ODD was associated with higher Time 2 symptoms.

Oppositional defiant disorder (ODD) involves a pattern of defiant, hostile, and negativistic behavior toward adults, and co-occurs with numerous psychological conditions, including conduct disorder (CD), generalized anxiety disorder (GAD), and major depressive disorder (MDD; Burke, Loeber, Lahey, & Rathouz, 2005; Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Drabick, Gadow, & Loney, 2007, 2008; Gadow & Nolan, 2002; Maughan, Rowe, Messer, Goodman, & Meltzer, 2004; Rowe, Maughan, Pickles, Costello, & Angold, 2002). Prospective research indicates that ODD tends to precede CD, depressive, and anxiety disorders, even after controlling for (a) concurrent co-occurring conditions and (b) initial levels of co-occurring symptoms (Burke et al., 2005; Costello et al., 2003; Lahey, Loeber, Burke, Rathouz, & McBurnett, 2002; Maughan et al., 2004; Rowe et al., 2002). Thus, epidemiological and clinic-based findings suggest that ODD may confer non-specific risk for numerous co-occurring conditions. However, little research involving prospective prediction from ODD to co-occurring symptoms has considered (a) differences in parent and teacher reports, (b) potential moderators of the ODD-co-occurring symptom relations, or (c) urban, low income, ethnic minority youth, who are at elevated risk for ODD symptoms.

There is accumulating evidence that among youth with ODD, symptom severity, impairment, and levels of comorbidity differ depending on the informant used to rate child symptoms (Drabick et al., 2007; Hart, Lahey, Loeber, & Hanson, 1994; Loeber, Burke, Lahey, Winters, & Zera, 2000). In both clinic- and community-based samples, researchers report low to moderate associations between parent- and teacher-reported ODD symptoms, and parents and teachers identify different children as meeting syndrome cutoffs for ODD (Drabick et al., 2007; Gadow & Nolan, 2002; Hart et al., 1994; Offord et al., 1996; van der Oord, Prins, Oosterlaan, & Emmelkamp, 2006). Based on data from the Disruptive Behavior

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Disorders (DBD) scale in a community-based sample, Owens and Hoza (2003) reported that compared to parent report, teacher-reported ODD symptoms, though lower on average, had higher predictive power for the diagnosis of ODD (determined by combining parent and teacher DBD symptom level information using the "or" rule). Results derived from diagnostic interviews in a clinic-based sample indicate that teacher-reported ODD was more strongly related to peer-reported impairment criteria (negative social preference and aggressive social status) than parent- or child-reported ODD (Hart et al., 1994). In addition, parent- and teacher-reported ODD groups have been associated with different patterns of co-occurring symptoms, with parents reporting higher MDD symptoms and teachers reporting higher CD symptoms among clinic-based youth with ODD (Drabick et al., 2007). These informant discrepancies likely stem from some combination of the child's characteristics, context in which ratings occur, aspects of rater perspectives, and measurement error. Further, they have led to a variety of strategies for addressing parent and teacher symptom reports (see De Los Reyes & Kazdin, 2005; Ferdinand, van der Ende, & Verhulst, 2004; Kraemer et al., 2003).

One strategy for examining co-occurring symptoms and impairment in ODD is to conceptualize ODD symptoms as source- or informant-specific syndromes. Two studies that specifically compared different strategies for considering parent- and teacher-reported ODD symptoms reported that source-specific ODD symptom groups demonstrated better internal validity and were more differentiated in psychosocial correlates and co-occurring symptoms than groups defined by combining across informants (Drabick et al., 2007; Offord et al., 1996). Moreover, compared to the source-specific ODD grouping strategy, combining reports of ODD symptoms across informants using the "or" rule increases the number of youth identified but does not augment correlations with peer-reported impairment criteria, suggesting that combining ODD symptom information across informants may increase the proportion of false positives (i.e., youth who meet ODD symptom but not impairment criteria; Hart et al., 1994).

Epidemiological and clinic-based studies using diagnostic interviews suggest that several different pathways likely are associated with ODD. Specifically, some youth will evidence continuing ODD symptoms, some youth will desist in ODD symptoms, and some will develop additional psychological conditions (Angold, Costello, & Erkanli, 1999a; Burke et al., 2005; Loeber, Burke, & Pardini, 2009; Loeber et al., 2000; Maughan et al., 2004). These different developmental pathways involving ODD symptoms may be due to moderating variables, such as child executive functioning (EF) abilities, which may interact with ODD symptoms in the prediction of subsequent behavioral and emotional symptoms. EF abilities are the meta-cognitive processes necessary for purposeful, future-oriented behavior (e.g., attention, concentration, working memory, planning, inhibition of impulsive or prepotent responses, and shifting behavior in response to external feedback; Welsh, Friedman, & Spieker, 2002; Zelazo & Frye, 1998).

The literature regarding links between EF deficits and ODD is mixed, largely because many studies evaluate ODD in conjunction with attention-deficit/hyperactivity disorder (ADHD). Research has examined EF abilities among children with ODD, with and without co-occurring ADHD (Drabick et al., 2007; Speltz, DeKlyen, Calderon, Greenberg, & Fisher, 1999; van Goozen et al., 2004); with ADHD, with and without co-occurring ODD (Sarkis, Sarkis, Marshall, & Archer, 2005); and ODD and/or ADHD (Drabick, Gadow, Carlson, & Bromet, 2004; Thorell & Wahlstedt, 2006). In general, findings suggest that children with co-occurring ODD and ADHD perform more poorly on EF tasks relative to youth with ODD only or ADHD only, and youth with ODD or ADHD exhibit EF deficits relative to youth with neither condition. Although studies considering youth with ADHD (e.g., Sarkis et al., 2005) suggest a specific link between EF deficits and ADHD, recent reviews of the literature

(Halperin & Schulz, 2006; Sergeant, Geurts, & Oosterlaan, 2002) indicate that EF deficits are only moderately associated with ADHD, and many EF deficits are shared by ADHD and ODD. Thus, EF deficits may account for some of the heterogeneity in the developmental pathways involving ODD and may moderate relations among ODD and co-occurring symptoms.

Although EF deficits are associated with ODD (Sergeant et al., 2002), depression (Purcell, Maruff, Kyrois, & Pantelis, 1997), and anxiety (Eysenck, Derakshan, Santos, & Calvo, 2007), there is evidence that CD is not necessarily associated with poor EF (Blair, 2004, 2007). Indeed, good EF abilities may facilitate some CD behaviors, including victimizing others while avoiding adult detection and recruiting others to conspire in aggressive acts (Deater-Deckard, 2001). These different patterns and within-category heterogeneity of ODD have led researchers to propose that there are at least two subgroups of youth with ODD: one who experiences poor EF abilities and elevated levels of emotional dysregulation, and a second who experiences better EF abilities and emotion regulation, and higher levels of proactive, relative to reactive, aggression (Blair, 2004, 2007; Drabick, Price, Lanza, & Chen, 2010). In terms of moderation, youth with elevated levels of ODD symptoms and poor EF could exhibit higher levels of emotion dysregulation (consistent with the first ODD subgroup) and thus MDD and GAD symptoms. Further, youth with ODD symptoms and higher levels of EF abilities may be more likely to exhibit CD symptoms, consistent with the second ODD subgroup.

Moreover, patterns of moderation may differ based on the informant used to rate ODD symptoms. In general, the school setting provides greater structure than the home, which may contribute to higher levels of ODD symptoms at home than school (Drabick et al., 2007). In addition, children who exhibit ODD behaviors toward a teacher, a sanctioned authority figure, may be more likely to receive negative responses from peers than children who engage in ODD behaviors toward their parents only (Drabick, Strassberg, & Kees, 2001). The paucity of literature considering prediction from source-specific ODD to co-occurring symptoms and moderators of these relations limits our ability to predict patterns of source-specific moderation. However, these findings regarding contextual differences suggest several potential hypotheses. First, children with good EF who engage in ODD behaviors at school may be more aware that their ODD behaviors are inconsistent with classroom expectations and more concerned about consequences than youth with ODD symptoms and lower EF abilities. Thus, youth with teacher-reported ODD symptoms and higher EF abilities may be more likely to exhibit MDD or GAD symptoms than youth with teacher-reported ODD symptoms and lower EF abilities. Second, higher EF abilities among children who engage in ODD behaviors toward parents may facilitate engaging in CD behaviors while escaping adult detection.

Tests of these moderational hypotheses in a sample of low income, urban, ethnic minority children are important for several reasons. First, residing in low socioeconomic status (SES) areas is associated with more severe and earlier onset behavior problems (Burke, Loeber, & Birmaher, 2002; Loeber et al., 2000). Second, children living in an urban, low SES environment are more likely to be exposed to physical and psychosocial stressors, deviant peer groups, violence, and maltreatment, each of which is associated with child behavior problems (Gorman-Smith & Tolan, 1998; McLoyd, 1998). Third, the likelihood of experiencing impairment associated with ODD is significantly greater among ethnic minority individuals (Ezpeleta, Keeler, Erkanli, Costello, & Angold, 2001). Given these risks and limited resources available for interventions, research examining ODD symptoms among children living in low income, urban settings can inform early identification and intervention efforts intended to lessen the effects of ODD and related sequelae (Burke et al., 2002; Gorman-Smith & Tolan, 1998; McLoyd, 1998).

In sum, we sought to address three gaps in the ODD literature by studying (a) the prospective prediction from parent- and teacher-reported ODD to subsequent parent-reported ODD, CD, MDD, and GAD symptoms; (b) child EF abilities as a moderator of these relations; and (c) urban, low income, ethnic minority children. Based on previous research involving source-specific ODD syndromes, we hypothesized that parent-reported ODD symptoms would predict MDD and GAD symptoms, and teacher-reported ODD symptoms would predict CD and GAD symptoms. Given that teacher reports evidence more differential prediction to outcomes and are more predictive of diagnosis and impairment, we hypothesized that teacher-reported ODD symptoms would continue to predict symptom outcomes (e.g., CD) above continuity of the co-occurring symptoms. In terms of source-specific moderation, we hypothesized that among youth with higher levels of teacher-reported ODD symptoms, higher EF abilities would predict higher levels of MDD and GAD symptoms. Among children with higher parent-reported ODD symptoms, we expected that higher EF abilities would predict higher levels of CD symptoms.

Method

Participants

Participants were 87 children (M = 7.75 ±1.05 years old at Time 1; 51% male, 93% African-American, 7% Latino/a) and their primary caregivers (91% biological mothers) drawn at Time 1 from first (41%), second (36%), and third (23%) grades from three public schools in Philadelphia. The urban neighborhoods from which families were drawn experience high levels of crime, poverty, and homogeneity in terms of race/ethnicity. Specifically, crime data for Philadelphia suggest that the participants reside in neighborhoods with the highest rates of aggravated assaults, robberies, burglaries, prostitution, narcotic arrests, and domestic abuse incidents (http://cml.upenn.edu/crimebase). Furthermore, neighborhood-level census data (http://factfinder.census.gov) indicate that 42% of families report a household income that falls below poverty threshold, compared to 58% in the present sample (one-sample t-test: $t(86) = 13.05$, $p < .001$), and 40% of adults report having less than a high school education, compared to 28% in the present sample ($t(86) = 6.53$, $p < .001$). Thus, the present sample reports higher levels of education but lower levels of family income compared to neighborhood level data. In the present sample, 52% of children lived in single-parent households, 32% in intact (i.e., two-biological parent) households, 7% in foster homes, and 9% in other family configurations (grandparental, adoptive). In terms of annual family income, 42% of families earned less than $10,000, 24% earned from $10,000–$20,000, 18% earned from $20,000–$30,000, and 16% earned more than $30,000. Sixty-four percent of the children lived in families receiving public assistance.

Procedure

The study was approved by Temple University's Institutional Review Board. The project director obtained permission from the principals of three elementary schools to send project information (study description, consent form, and self-addressed stamped postcard) to families of first- through third-grade children. Caregivers (hereafter, parents) interested in participating either returned the postcard with their contact information or called to make an appointment. Approximately 21% of families responded to the information sent, which is consistent with other research using high-risk samples with similar ethnic and SES compositions (e.g., Sessa, Avenevoli, Steinberg, & Morris, 2001; Silk, Sessa, Morris, Steinberg, & Avenevoli, 2004). The sample characteristics (i.e., ethnicity, sex, family SES) reflect the schools from which the families were drawn. Nevertheless, due to confidentiality requirements, no information was available to compare those who self-selected into the project and those who did not.

Parents and their children visited the lab at two time points, spaced approximately one year apart. At the first time point (Time 1), parents and their children were invited to the research lab for 2 visits, each lasting approximately 2.5 hours. Parents and children provided consent and assent, respectively, prior to participation. Parents completed questionnaires related to their child, family, and themselves. Children worked with a trained research assistant on various activities, including computerized tasks designed to assess EF. Teachers were contacted following parental consent and were sent measures related to the child's behaviors. Teachers were paid for each set of measures completed. Although teacher reports were requested for all participants, teacher reports were obtained for only a subset of children (n = 64, 74%). Multiple attempts were made to obtain teacher reports, including sending several letters containing child measures to teachers, visiting teachers in school, offering bonus incentives, and principals' making additional requests to the teachers. Analyses examining differences between the children for whom teacher measures were and were not completed revealed no significant differences for child sex or race/ethnicity (both χ^2s < 1.48, both ps > .05), or for child age, household income, or primary caregiver education (all ts < 1.01, all ps > .05).

Approximately 9 months after their initial visit, parents and their children were invited to our research lab for 1 visit, lasting approximately 2.5 hours (Time 2), during which parents completed measures related to their child's behavior. On average, families came in 10.7 ± 1.3 months after the Time 1 visit. At both time points, parents were paid for their participation and reimbursed for transportation, and children received a gift. A donation was made to the school for every child who participated at Time 1. Children for whom Time 1 and Time 2 data were collected (n = 64, 73% also had teacher-report data) did not differ (all ps > .05) from those who only completed both visits at Time 1 (N = 87) in terms of age, $t(85) = .40$, Cohen's $d = .09$; sex, $\chi^2(1) = .11$, $\phi = .03$; ethnicity, $\chi^2(1) = 1.24$, $\phi = .12$; family configuration, $\chi^2(4) = 1.14$, $\phi = .11$; income, $\chi^2(3) = .14$, $\phi = .04$; Time 1 parent-reported symptoms: ODD $t(84) = 1.56$, Cohen's $d = .34$; CD $t(84) = .33$, Cohen's $d = .07$; MDD $t(29) = 1.53$, Cohen's $d = .57$ (equal variances not assumed); or GAD $t(28) = 1.99$, Cohen's $d = .75$ (equal variances not assumed); executive functioning, $t(85) = 1.46$, Cohen's $d = .32$; or Time 1 teacher-reported symptoms: ODD $t(62) = 1.22$, Cohen's $d = .31$; CD $t(62) = .33$, Cohen's $d = .08$; MDD $t(62) = .36$, Cohen's $d = .09$; or GAD $t(62) = .31$, Cohen's $d = .08$ (Cohen, 1988). Although the differences were not statistically significant, the corresponding effect sizes were often moderate, suggesting that the families who did not complete the follow-up likely differed from the families who did. Thus, given that the observed data can facilitate prediction of attrition, these data are useful for predicting missing data (Graham, 2009; Little & Rubin, 2002; Rubin, 1987; Schafer, 1997). As such, we used multiple imputation to address missing data (described below).

At Time 2, teachers were contacted following parental consent and were sent measures related to the child's behaviors. Despite multiple attempts and strategies for obtaining teacher reports at Time 2, we were able to obtain reports for only 55% (n = 48) of the children. Because of this high percentage of missing data, combined with the relatively small sample size, we did not have sufficient coverage to estimate and impute the missing teacher data (Bodner, 2008; Graham, 2009; Rubin, 1987). Thus, we considered teacher-reported symptoms at Time 1 but not Time 2.

Measures

Demographics—Parents provided information about their child's sex (N = 87) and household income (n = 83) as part of a background information questionnaire. Parents were asked to select the range that best represented their annual household income using a forced

choice format that included 8 categories and ranged from 1 (*0 to $9,999*) to 8 (*Over $70,000*).

ODD symptoms—At Time 1, parents and teachers rated ODD symptoms using their respective versions of the Child Symptom Inventory-4 (CSI-4; Gadow & Sprafkin, 1994, 2002). The CSI-4 contains the behavioral symptoms of most childhood disorders described in the *Diagnostic and statistical manual of mental disorders-Fourth edition* (*DSM-IV;* APA, 1994). Individual items bear one-to-one correspondence with *DSM-IV* symptoms (i.e., high content validity). Because our goal was to examine processes associated with ODD and co-occurring symptoms, as opposed to the diagnostic categories, and given evidence that the symptoms associated with these disorders often cause significant impairment (Angold, Costello, Farmer, Burns, & Erkanli, 1999b), we examined these symptoms dimensionally. Items reflect the 8 symptoms associated with ODD and are worded identically for the parent and teacher versions of the CSI-4. Items include, “Easily loses temper” and “Often argues with adults.” Items were rated on a scale from 0 (*never*) to 3 (*very often*). The sum of the items was used to index parent-reported ($\alpha = .90$, $n = 86$) and teacher-reported ($\alpha = .96$, $n = 64$) ODD symptoms. Higher scores indicate greater ODD symptom severity. The mean parent- and teacher-reported ODD scores for the present sample and the associated percentiles based on the normative sample (Gadow & Sprafkin, 2002) were as follows: parent-reported ODD symptoms, boys $M = 7.10$, 69^{th} percentile; girls $M = 5.44$, 64^{th} percentile; teacher-reported ODD symptoms, boys $M = 6.08$, 83^{rd} percentile; girls $M = 4.49$, 91^{st} percentile. Thus, as would be expected, ODD symptoms on average were elevated among this higher risk sample compared to the normative sample.

Executive functioning—At Time 1, children completed the Intra/Extra Dimensional Set Shift (IED) subtest ($N = 87$) from the Cambridge Neuropsychological Test Automated Battery (CANTAB; Luciana & Nelson, 2002), a computer-based touch-screen system. The CANTAB is theoretically derived and has demonstrated good construct validity for measuring brain-behavior relations (Luciana & Nelson, 2002). The IED is similar to the Wisconsin Card Sort task, and involves a variety of EF abilities (i.e., attention, concentration, working memory, planning, inhibition of prepotent and impulsive responding, and set-shifting based on feedback). Children were required to use computer-provided feedback to learn response contingencies. This test measures an individual’s ability to attend to specific attributes of compound stimuli, and to shift attention from one characteristic to another depending on the criterion for each stage. The standardized score for the total number of stages completed was used to index EF; thus, higher scores are indicative of higher EF abilities.

Time 1 co-occurring symptoms—At Time 1, both parents and teachers used the CSI-4 (Gadow & Sprafkin, 1994, 2002) to rate child symptoms for CD (15 items; parent $\alpha = .71$, $n = 86$; teacher $\alpha = .89$, $n = 64$); MDD (10 items; parent $\alpha = .79$, $n = 85$; teacher $\alpha = .74$, $n = 64$); and GAD (7 items, both αs = .77; parent $n = 84$, teacher $n = 64$). Items were rated on a scale from 0 (*never*) to 3 (*almost always*) and summed to create a symptom severity score for each category.

Outcome measures—At Time 2, parents completed the CSI-4 for the following categories ($n = 64$): ODD (8 items, $\alpha = .92$), CD (15 items, $\alpha = .72$), MDD (10 items, $\alpha = .79$), and GAD (7 items, $\alpha = .78$). The mean parent-reported scores for the present sample and associated percentiles based on the normative sample (Gadow & Sprafkin, 2002) were as follows: ODD symptoms, boys $M = 7.25$, 71^{st} percentile; girls $M = 5.38$, 64^{th} percentile; CD symptoms, boys $M = 2.12$, 84^{th} percentile; girls $M = 1.42$, 82^{nd} percentile; MDD symptoms, boys $M = 1.69$, 32^{nd} percentile; girls $M = 1.44$, 33^{rd} percentile; and GAD

symptoms, boys $M = 3.75$, 67th percentile; girls $M = 3.05$, 71st percentile. Thus, on average, ODD, CD, and GAD outcome scores were higher, and MDD scores were lower, in the present sample compared to the normative sample.

Data Analyses

Given that longitudinal research often is plagued by the problem of missing data, we used multiple imputation (MI) to address missing data. Use of certain strategies (e.g., complete casewise analysis or listwise deletion, complete case analyses or pairwise deletion, nonresponse weighting, mean imputation) may bias an analytic sample (Bodner, 2008; Graham, 2009; Little & Rubin, 2002; Rubin, 1987). As a result, we did not want to omit participants with missing data from the analyses. MI is an analytic technique that fills in missing data with predicted values based on available data, and then results are averaged across datasets to obtain final estimates of effects (Rubin, 1987; Schafer, 1997). The analytic benefit of MI over other types of imputation (e.g., single imputation) is that MI imputes *multiple* values for each missing value, allowing for variability resulting from both sampling error and model uncertainty. MI is well-suited to the current analyses because it (a) accommodates many different patterns of missing data, (b) reflects uncertainty in missing values, and (c) assumes that two people have the same probability of having missing data on a variable *only if* they have the same values for all other variables (also referred to as the missing at random assumption; Little & Rubin, 2002). The effect sizes for differences in Time 1 variables among children with and without complete data suggest that observed data can be used to predict missingness, consistent with the MAR assumption (Graham, 2009; Little & Rubin, 2002; Rubin, 1987). Based on previous recommendations (Graham, 2009; Little & Rubin, 2002; Schafer, 1997), we included auxiliary variables in the MI that were consistent with our conceptual model and that we expected would predict attrition (e.g., family stressors) and thus missingness. These variables included demographic and family-level variables (sex, age, income, race/ethnicity, parent-reported economic stress and life stressors in the past year); Time 1 parent- and teacher-reported symptoms (ADHD, ODD, CD, MDD, GAD); five CANTAB tasks (including IED) designed to assess various aspects of EF (e.g., attention, planning, working memory); and parent- and teacher-reported peer processes that are highly correlated with child psychological symptoms (e.g., rejection, bullying). Further details regarding the variables used in the MI are available from the first author.

We used recommendations by Bodner (2008), which are based on simulation studies that varied the proportion of missing data and number of imputations, to estimate the number of imputations that would allow for relatively precise estimation and accurate significance levels given our sample size and percent of missing data. Based on these recommendations, we determined that we should impute 20 datasets. We used SAS Proc MI (SAS Institute Inc., 2006) to deal with missing data, and the remaining analyses were conducted in Mplus version 5.2 (Muthén & Muthén, 1998–2007), which averaged results across the 20 imputed datasets. Means and *SD*s using MI ($N = 1740$) vs. casewise deletion are available from the first author.

We conducted descriptive statistics and bivariate correlations to examine relations among the predictor and outcome variables. To examine potential sex differences in the base rates of study variables, we conducted independent sample *t*-tests. The primary analyses involved multiple regression analyses predicting Time 2 parent-reported ODD, CD, MDD, or GAD symptoms. For each set of analyses, child sex (0 = *male*, 1 = *female*), age, and family income were entered first. The first set of analyses considered prediction to each Time 2 parent-reported symptom outcome from both (a) Time 1 parent-reported ODD symptoms and (b) Time 1 teacher-reported ODD symptoms, which permitted a direct comparison between parent- and teacher-reported ODD symptoms. The second set of analyses included

the respective Time 1 parent- and teacher-reported symptoms (e.g., Time 1 parent- and teacher-reported CD symptoms were included in regressions predicting Time 2 CD symptoms) to determine whether Time 1 ODD symptoms predicted outcomes above the continuity associated with relevant Time 1 symptoms.

The third set of analyses considered whether EF abilities (IED) moderated the prediction from Time 1 ODD symptoms to Time 2 symptom outcomes. Separate regression analyses were conducted for which Time 2 parent-reported ODD, CD, MDD, or GAD symptoms were the dependent variable. Each regression equation involved the following steps: (a) child age, sex, and family income; and (b) ODD symptoms (parent- or teacher-reported), IED stages completed, and the ODD × IED cross-product interaction term. To minimize multicollinearity, the independent variables were centered (M=0) before inclusion in the regression equations (Aiken & West, 1991). For significant interaction terms, we followed procedures outlined by Holmbeck (2002) for post-hoc probing of significant moderational effects.

Results

Descriptive Statistics

Bivariate correlations, means, and standard deviations for all study variables combined across the 20 imputed datasets are presented in Table 1. Both Time 1 parent- and teacher-reported ODD symptoms, respectively, were associated with higher levels of Time 2 parent-reported ODD, CD, and MDD symptoms. Time 2 GAD symptoms were associated with Time 1 parent-reported, but not teacher-reported, ODD symptoms. Time 1 parent- and teacher-reported ODD symptoms also were significantly associated. Independent sample t-tests revealed that boys received higher scores on all symptom reports except Time 1 parent-reported GAD and Time 2 parent-reported MDD symptoms. Girls scored higher than boys on the IED task (Table 1).

Prospective Prediction of Time 2 Symptoms

The first set of analyses considered prediction to each of the Time 2 parent-reported symptom outcomes from Time 1 parent- and teacher-reported ODD symptoms, which permitted these variables to compete against each other in predicting symptom outcomes (Table 2). Despite sex differences in base rates for most of the predictors (Table 1), sex did not significantly predict any of the Time 2 symptom outcomes (Table 2). Both Time 1 parent- and teacher-reported ODD symptoms, respectively, predicted Time 2 CD and MDD symptoms. Only parent-reported ODD symptoms predicted Time 2 ODD and GAD symptoms. The second set of analyses included Time 1 parent- and teacher-reported covarying symptoms to control for continuity of each symptom outcome (bottom half of Table 2). After controlling for Time 1 parent- and teacher-reported CD symptoms, only Time 1 teacher-reported ODD symptoms remained significant in the prediction of Time 2 CD symptoms. Similarly, after controlling for Time 1 parent- and teacher-reported MDD symptoms, only Time 1 teacher-reported ODD symptoms significantly predicted Time 2 MDD symptoms. After controlling for Time 1 parent- and teacher-reported GAD symptoms, prediction from Time 1 ODD symptoms to Time 2 GAD symptoms was no longer significant.

Tests of Moderation

The third set of analyses considered whether EF abilities (IED) moderated the relations between Time 1 parent- or teacher-reported ODD symptoms and Time 2 parent-reported symptom outcomes (Table 3). Time 1 parent-reported ODD symptoms significantly predicted all Time 2 outcomes. However, the parent-reported ODD × IED interaction term

only predicted Time 2 ODD symptoms. Time 1 teacher-reported ODD symptoms predicted Time 2 ODD, CD, and MDD symptoms, and the teacher-reported ODD × IED interaction term predicted CD and MDD symptoms.

Following procedures described by Aiken and West (1991) and Holmbeck (2002) for probing and graphing significant interactions, we computed two new conditional moderator variables (± 1 *SD* from the mean for IED task performance) and new interactions that incorporated the conditional variables. We then ran two post-hoc regressions, each of which involved simultaneous entry of ODD symptoms, one of the conditional IED variables, and the ODD symptoms × conditional IED variable (Holmbeck, 2002). From these analyses, we derived unstandardized betas (slopes) for the ODD variables and constants (intercepts). To graph the interactions, we included the slopes and intercepts in regression equations that included scores that were 1 *SD* above and 1 *SD* below the mean on the IED task (Holmbeck, 2002).

In terms of Time 2 ODD symptoms, post-hoc probing of the IED × parent-reported ODD symptoms revealed that the slopes were significant for high IED, b = .91, $p < .001$, and low IED, b = .64, $p < .001$ (Figure 1). In terms of Time 2 CD symptoms, post-hoc probing of the IED × teacher-reported ODD symptoms revealed that the slope was significant for high IED, b = .21, $p < .001$, but not low IED, b = .02, $p = .73$ (Figure 2). Similarly, in terms of MDD symptoms, the slope was significant for high IED, b = .17, $p < .001$, but not low IED, b = .04, $p = .40$ (Figure 3). Examination of these figures reveals similar patterns for parent- and teacher-reported ODD symptoms and for each outcome. Low Time 1 ODD symptoms were associated with low Time 2 symptom outcomes. Children with poorer EF abilities (low IED) and higher Time 1 parent-reported ODD symptoms were at greater risk of Time 2 parent-reported ODD symptoms than children with lower Time 1 parent-reported ODD symptoms (Figure 1). However, examination of Figure 1 indicates that the greatest risk for Time 2 parent-reported ODD symptoms was among youth with high parent-reported ODD symptoms and better EF abilities. Examination of Figures 2 and 3 reveals that risk for Time 2 CD and MDD symptoms, respectively, was similar among youth with poorer EF, regardless of Time 1 teacher-reported ODD symptom levels. Among children with better EF abilities, low teacher-reported ODD was associated with very low levels of Time 2 parent-reported CD and MDD symptoms. However, among youth with higher levels of teacher-reported ODD symptoms, better EF was associated with higher levels of Time 2 parent-reported CD and MDD symptoms.

Discussion

Although ODD independently predicts numerous psychological conditions (Burke et al., 2005; Maughan et al., 2004; Rowe et al., 2002), little research involving prospective prediction from ODD to co-occurring symptoms has considered different informants or potential moderators of these relations. The current results confirm that patterns of co-occurring symptoms differ based on whether parent- or teacher-reported ODD is considered, with teacher reports providing greater predictive utility for CD and MDD symptoms after controlling for initial levels of co-occurring symptoms and parent-reported ODD symptoms. These results support the use of source-specific syndromes for conceptualizing ODD (Drabick et al., 2007; Offord et al., 1996), and extend findings to low income, urban, ethnic minority youth, who are at increased risk for early behavior problems and impairment associated with ODD (Burke et al., 2002; Ezpeleta et al., 2001; McLoyd, 1998). Moreover, tests of moderation suggest that better EF abilities may confer prospective risk for ODD, CD, and MDD symptoms among youth with ODD living in low income, urban areas.

Parent- vs. Teacher-reported ODD Symptoms

Although the results of the regression analyses generally supported previous research indicating that ODD predicts CD, MDD, and GAD symptoms (Angold et al., 1999a; Burke et al., 2005; Maughan et al., 2004; Rowe et al., 2002), controlling for initial co-occurring symptoms provided a more nuanced picture. Specifically, Time 1 teacher-reported, but not parent-reported, ODD symptoms predicted Time 2 CD and MDD symptoms after controlling for Time 1 parent-reported ODD and Time 1 parent- and teacher-reported CD and MDD symptoms, respectively. These results are consistent with research indicating that teacher-reported symptoms may provide more differentiation in predicting outcomes (Drabick et al., 2007, 2008; Gadow & Nolan, 2002; Offord et al., 1996), though inclusion of Time 2 teacher-reported outcomes would be optimal for confirming this interpretation. In terms of prediction to GAD, Time 1 parent-reported, but not teacher-reported, ODD symptoms predicted Time 2 parent-reported GAD symptoms. However, this association was no longer significant after controlling for Time 1 parent- and teacher-reported GAD symptoms. With the exception of GAD outcomes, these results are similar to findings from epidemiological studies indicating that ODD predicts subsequent CD and MDD after controlling for affective and anxiety disorders (Costello et al., 2003; Maughan et al., 2004). Nevertheless, these previous studies generally considered parent and/or youth reports using diagnostic interviews. The present findings thus confirm the importance of including teacher-reported symptoms in research examining ODD and co-occurring symptoms (Hart et al., 1994; Owens & Hoza, 2003).

Moderating Effects of Executive Functioning on ODD Symptoms

Among youth exhibiting higher levels of EF abilities, higher parent-reported ODD symptoms were associated with subsequent ODD symptoms, whereas higher teacher-reported ODD symptoms were associated with subsequent CD and MDD symptoms. The moderation findings thus are consistent with previous research indicating differential prediction based on informant. Contrary to prediction, youth with better EF abilities were more likely to exhibit continued parent-reported ODD symptoms, suggesting that the ODD behaviors are serving an adaptive function (e.g., removal of parental requests, parents' complying with child's demands), and thus children with ODD learn these contingencies and continue to engage in ODD behaviors. Consistent with prediction, children with better EF who exhibit teacher-reported ODD behaviors may be more aware that their behavior is inconsistent with classroom expectations and more concerned about consequences, which may contribute to MDD symptoms. Last, associations among higher EF abilities, teacher-reported ODD symptoms, and CD symptoms suggests that better EF may facilitate engaging in CD behaviors while escaping adult detection among this urban, low income sample of children. Thus, better EF abilities in the context of parent-reported ODD symptoms is associated with continuation of ODD symptoms, but better EF abilities in the context of teacher-reported ODD symptoms is associated with different co-occurring conditions.

Children with higher Time 1 parent-reported ODD symptoms and poorer EF abilities exhibited higher levels of Time 2 ODD symptoms compared to youth with lower Time 1 ODD symptoms consistent with the hypothesized subgroup of youth with ODD who exhibit poor EF. In contrast, we did not find evidence for this subgroup in the teacher-reported ODD analyses. Children with higher Time 1 teacher-reported ODD symptoms and better EF abilities exhibited the highest Time 2 CD levels, consistent with the hypothesized subgroup of youth with ODD and better EF, which may facilitate engaging in CD behaviors (Blair, 2004, 2007; Deater-Deckard, 2001). Future research should test whether these patterns of findings are specific to youth residing in urban areas. Indeed, it may be more adaptive in contexts characterized by high crime and violence to establish dominance and engage in externalizing behaviors, and youth with better EF may be particularly adept at doing so.

Another possibility is that youth with ODD and better EF abilities also may exhibit callous-unemotional traits, which could confer risk for CD symptoms (Blair, 2007; Drabick et al., 2010; Loeber et al., 2009).

A similar and unexpected pattern emerged with MDD symptoms; specifically, among youth with higher teacher-reported ODD symptoms, higher EF abilities were associated with the highest rates of subsequent MDD symptoms. However, the base rates of MDD symptoms were very low in the present sample, and future research will be necessary to determine whether this pattern extends to other samples with clinically significant MDD symptoms. One possible reason for this finding that is that among low income, urban children, better EF abilities may facilitate reflection on psychosocial and contextual stressors, which may contribute to MDD symptoms. The findings of moderation with teacher-reported, but not parent-reported, ODD symptoms are in line with findings of greater predictive utility from teacher-reported symptoms. In contrast to teacher-reported ODD symptoms, parent-reported ODD symptoms may provide predictive utility for continuity of ODD symptoms, particularly when moderating variables also are considered. Our use of a laboratory task to index EF was intended to minimize overlap among informants and methods, but may better correspond to youth performance in the school setting (Luciana & Nelson, 2002). Thus, additional processes (e.g., decision-making in affective circumstances, emotion dysregulation, reactive aggression) should be incorporated into future research evaluating relations among ODD and co-occurring symptoms (Bubier & Drabick, 2009).

Strengths and Limitations

The present study has several strengths. First, we considered parent- and teacher-reported ODD symptoms and potential co-occurring symptoms using a prospective design. These findings thus extend research involving source-specific syndromes to an inner-city sample and confirm the utility of using multiple informants (Drabick et al., 2007; Offord et al., 1996). Second, we controlled for both parent- and teacher-reported initial symptom levels, which provided a more nuanced picture of source-specific prediction, and supported previous findings indicating that teacher-reported symptoms evidence more differential prediction (Drabick et al., 2007; Hart et al., 1994; Owens & Hoza, 2003). Third, we considered these processes among low income, urban, ethnic minority children, who are at increased risk for early-onset behavior problems and associated impairment (Burke et al., 2002; Ezpeleta et al., 2001; McLoyd, 1998). Last, we considered child EF abilities as a moderator of the prospective relations between ODD and co-occurring symptoms, which can inform etiological and prevention models. Moreover, our use of a laboratory task allowed us to minimize biases associated with shared method variance.

Several limitations must be acknowledged. First, ODD and co-occurring symptoms were defined using a rating scale, not a diagnostic interview. Thus, the *DSM-IV* symptoms examined were not equivalent to the relevant diagnostic categories. Nevertheless, the *DSM*-referenced rating scale used has been included in numerous studies of ODD and co-occurring symptoms (e.g., Drabick et al., 2007, 2008; Gadow & Nolan, 2002). Moreover, the symptoms associated with these disorders often cause significant impairment, even at subthreshold levels (Angold et al., 1999b). Second, child EF and ODD symptoms were measured at Time 1. Thus, child EF may be better conceptualized in an alternative role (e.g., correlate, mediator, or shared risk process) for ODD and the co-occurring symptoms. Another potential limitation was our decision not to consider ADHD symptoms, despite high comorbidity rates between ADHD and ODD. Although ODD precedes the development of CD, MDD, and GAD, ADHD precedes ODD (Burke et al., 2005). Given our focus on prediction from ODD to co-occurring symptoms, we instead examined processes purportedly associated with ADHD (i.e., EF) that may facilitate the development of comorbid symptoms among youth with ODD. Future research that considers the

mechanisms that link ADHD and ODD to co-occurring conditions is important. Further, although the merits of examining these processes in a sample characterized by elevated contextual risk are notable, ethnicity and SES were largely confounded, and the sampling method (i.e., self-selection) introduces the possibility of sampling biases. Specifically, families who chose to participate may have differed from families who received information and chose not to participate, which can affect the generalizability of the findings beyond urban, inner city, low income children. Future research is necessary to examine the generalizability of these findings. If the results generalize to varying SES and ethnic groups, this would suggest that the present findings are generally characteristic of children with ODD. If the findings do not generalize, these results may suggest that contextual factors (e.g., poverty, neighborhood characteristics) exert a more important or proximal influence on ODD and co-occurring symptoms among children who reside in urban, low SES environments.

Although the study design enabled us to consider prospective prediction from parent- and teacher-reported ODD symptoms, the average interval between assessments (< 1 year) and younger age of the sample (second to fourth grade at Time 2) may have precluded identifying additional co-occurring symptom associations. The relatively low rate of teacher participation at Time 2 also precluded our examining prediction to Time 2 teacher outcomes, which would have provided a more thorough test of the utility of source-specific syndromes. Future research that involves additional time points, developmental periods, and informants across assessment periods may be more useful for disentangling relations among ODD and co-occurring symptoms.

Implications for Research, Policy, and Practice

Consistent with previous work (De Los Reyes & Kazdin, 2005; Drabick et al., 2007; Kraemer et al., 2003; Offord et al., 1996), the present findings indicate that aggregating information across informants may mask within-group differences, and suggest that considering teacher reports could be a useful adjunct to traditional parent reports of ODD. Future research that considers alternative ways of aggregating information across settings and informants could further our understanding of the optimal way to consider different informants of ODD symptoms. For example, youth who exhibit ODD according to multiple informants are rated as exhibiting more severe ODD and co-occurring symptoms than youth who exhibit ODD symptoms based on only one informant (Drabick et al., 2007; Offord et al., 1996), though this pattern of findings may differ among youth exhibiting co-occurring ADHD or CD and depending on the developmental period examined (De Los Reyes, Henry, Tolan, & Wakschlag, 2009; Fergusson, Boden, & Horwood, 2009). Thus, research that employs a categorical approach (e.g., compares youth who meet criteria based on parent and/or teacher report for the diagnosis of ODD), considers different developmental periods, and evaluates the effects of co-occurring conditions would be useful for examining cross-informant ODD. Such efforts also could include asking informants about their attributions for the child's behavior and considering contextual factors (e.g., level of structure, parental stress) in determining the sources of informant discrepancies (De Los Reyes & Kazdin, 2005; van der Oord et al., 2006).

Considering ODD as a source-specific syndrome also may be useful for constructing interventions relevant to the settings in which problem behaviors occur. Parenting, family-based, and/or school-based interventions that address not only ODD symptoms, but also potential risk processes or moderators, may prevent the development or exacerbation of co-occurring symptoms (e.g., Lochman & Wells, 2004). Youth with ODD who also exhibit better EF may be good candidates for cognitive-behavioral therapy, given that EF abilities would be useful for this type of intervention. Future research will be necessary to address such issues as whether child EF is a moderator or mechanism of treatment outcome,

treatment of ODD precludes the development of additional conditions (i.e., tertiary prevention), or additional correlates (e.g., contextual factors, informants' perspectives) can improve treatment outcomes.

Future research should seek to replicate and extend the moderator findings to address whether these patterns of findings are specific to youth who experience elevated levels of psychosocial stressors or neighborhood danger. Similarly, consideration of additional markers for the subgroup of youth with ODD who exhibit good EF (e.g., callous-unemotional traits, limbic underactivity) could aid in understanding the relations among ODD, higher levels of EF, and CD (Drabick et al., 2010; Loeber et al., 2009). Other ways to examine the generalizability of these findings are to consider additional indices (e.g., laboratory tasks, diagnostic interviews) of EF and ADHD symptoms, as well as tasks that may better generalize to EF in the home (e.g., affective decision-making or gambling tasks). The inclusion of diagnostic interviews could also rule out explanations related to contextual demands vs. informant differences that may occur when considering parent and teacher reports.

We identified sex differences in base rates of most study variables. Unexpectedly, when sex differences were found for symptoms, boys consistently were rated higher than girls. Nevertheless, sex did not significantly predict outcomes in the regression equations. Future research that examines whether sex differences in symptom prevalence rates result from informant or other methodological biases, higher rates of exposure to risk factors, or differential sensitivity to risk factors is necessary to better understand how sex differences in symptom levels arise (Rutter, Caspi, & Moffitt, 2003). Moreover, considering multiple outcomes concurrently would permit researchers to control for variance that is shared among outcomes. We instead evaluated prediction to individual symptom outcomes to determine whether previous findings regarding source specificity in ODD could be extended to a high risk, urban, low SES sample. The relatively low base rates of some symptoms in childhood (e.g., MDD) and the present sample size precluded joint consideration of all symptom outcomes. However, previous research that concurrently considers multiple symptom outcomes in clinic-based (Burke et al., 2005) and older epidemiological (Maughan et al., 2004; Rowe et al., 2002) samples indicates that ODD remains a significant predictor of multiple conditions even in this analytic framework.

In sum, the present findings confirm previous research indicating that ODD symptoms prospectively predict additional psychological symptoms, including CD, MDD, and GAD, and extend these findings to an urban, low income sample. Consideration of parent- and teacher-reported ODD symptoms suggests that prediction is not uniform across informants, and that the methodological issue of selecting reporters will influence the patterns of findings evidenced. Results support the use of source-specific syndromes when conceptualizing ODD among youth. They also suggest that EF abilities may buffer risk among some youth, but may confer risk for additional psychological symptoms among youth with elevated ODD symptoms living in low income, urban neighborhoods. Future research that considers multiple informants and additional moderators of the relations among ODD and co-occurring symptoms can inform etiological models, and provide insights for framing preventive interventions in multiple settings. These efforts potentially can mitigate the effects of ODD symptoms and preclude or minimize co-occurring symptoms and impairment among youth.

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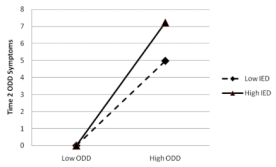

Figure 1.
Relation between Time 1 parent-reported ODD symptoms and Time 2 parent-reported ODD symptoms among children with high (1 *SD* above mean) vs. low (1 *SD* below mean) performance on the Intra/Extra Dimensional Set Shift task (IED).

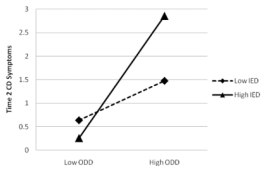

Figure 2.
Relation between Time 1 teacher-reported ODD symptoms and Time 2 parent-reported CD symptoms among children with high (1 *SD* above mean) vs. low (1 *SD* below mean) performance on the Intra/Extra Dimensional Set Shift task (IED).

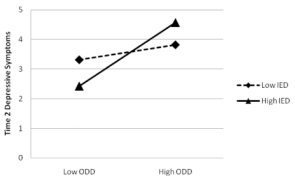

Figure 3.
Relation between Time 1 teacher-reported ODD symptoms and Time 2 parent-reported MDD symptoms among children with low (1 *SD* above mean) vs. high (1 *SD* below mean) performance on the Intra/Extra Dimensional Set Shift task (IED).

Table 1

Bivariate Correlations, Means, and Standard Deviations among Study Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	114	15
1. T1 PCSI ODD	-														
2. T1 TCSI ODD	.25*	-													
3. Age	.21	.06	-												
4. Income	.06	−.08	−.02	-											
5. IED	.15	.05	−.12	.03	-										
6. T1 PCSI CD	.72***	.15	.16	.11	.13	-									
7. T1 PCSI MDD	.58***	.14	.17	.00	.07	.46***	-								
8. T1 PCSI GAD	.48***	.14	.22*	−.05	.02	.35**	.72***	-							
9. T1 TCSI CD	.27*	.71***	.04	−.04	.06	.19	.08	.01	-						
10. T1 TCSI MDD	.25*	.18	.31**	−.22*	−.03	.28**	.36***	.16	.05	-					
11. T1 TCSI GAD	.20	.29**	.23*	−.16	.10	.19	.32**	.14	.20	.80***	-				
12. T2 PCSI ODD	.71***	.32**	.07	.08	.29**	.58***	.53***	.46***	.35***	.06	.09	-			
13. T2 PCSI CD	.62***	.34**	.04	.10	.23*	.69***	.47***	.27*	.26*	.28**	.20	.60***	-		
14. T2 PCSI MDD	.47***	.34**	.30**	.13	.13	.37***	.65***	.44***	.24*	.39***	.47***	.53***	.56***	-	
15. T2 PCSI GAD	.50***	.20	.23*	−.03	.11	.32**	.55***	.68***	.21	.20	.28**	.68***	.35**	.62***	-
Sample *M*	6.28	5.55	7.75	2.15	−.13	1.71	1.40	2.73	2.41	1.46	3.44	6.33	1.54	1.49	3.50
Sample *SD*	5.13	6.18	1.05	1.27	1.10	2.63	2.27	2.93	3.79	1.79	3.21	5.93	2.28	2.00	3.31
Boys *M*	7.10[a]	5.98[a]	7.76	2.09	−.22[b]	2.16[a]	1.56[a]	2.86	2.98[a]	1.83[a]	4.15[a]	7.25[a]	1.78[a]	1.54	3.86[a]
Boys *SD*	4.92	6.08	1.11	1.25	.87	2.85	2.30	2.38	4.46	1.97	3.66	5.27	2.54	2.01	2.97
Girls *M*	5.44[a]	5.12[a]	7.75	2.21	−.03[b]	1.26[a]	1.23[a]	2.60	1.83[a]	1.07[a]	2.72[a]	5.38[a]	1.31[a]	1.43	3.14[a]
Girls *SD*	5.22	6.25	.99	1.30	1.28	2.31	2.23	3.40	2.83	1.48	2.48	6.40	1.96	1.99	3.59

Note. T1 = Time 1, T2 = Time 2, PCSI = Parent-reported Child Symptom Inventory-4, TCSI = Teacher-reported Child Symptom Inventory-4, ODD = oppositional defiant disorder symptoms, CD = conduct disorder symptoms, MDD = major depressive disorder symptoms, GAD = generalized anxiety disorder symptoms, IED = CANTAB Intra/Extra Dimensional Set Shift number of stages completed.

[a]Boys > girls.

[b]Girls > boys.

* $p < .05$,

** $p < .01$,

*** $p < .001$.

Table 2

Multiple Regression Analyses with Joint Consideration of Parent- and Teacher-reported ODD Symptoms Predicting Time 2 Symptoms

	Time 2 Symptom Outcomes			
Time 1 Predictors	**ODD**	**CD**	**MDD**	**GAD**
Parent- vs. Teacher-reported ODD				
Sex	−.16	−.11	−.03	−.11
Age	.07	.04	.30**	.23*
Income	.08	.10	.14	−.02
Parent-reported ODD symptoms	.67***	.58***	.36**	.45***
Teacher-reported ODD symptoms	.16†	.20*	.25**	.08
Controlling for Covarying Symptoms				
Parent-reported ODD symptoms	–	.21	.04	.18
Teacher-reported ODD symptoms	–	.28**	.24**	.04

Note. Coefficients are standardized Beta weights. ODD = oppositional defiant disorder symptoms, CD = conduct disorder symptoms, MDD = major depressive disorder symptoms, GAD = generalized anxiety disorder symptoms. Analyses in bottom half of table considered prediction from Time 1 ODD symptoms controlling for sex, age, income, and the respective Time 1 parent- and teacher-reported symptoms (e.g., controlling for Time 1 CD symptoms in predicting Time 2 CD symptoms).

† $p < .10$,

* $p < .05$,

** $p < .01$,

*** $p < .001$.

Table 3

Multiple Regression Analyses for the IED × ODD Symptoms Interaction Terms in the Prediction of Time 2 Symptoms

	Time 2 Parent-reported Symptoms			
Time 1 Predictors	**ODD**	**CD**	**MDD**	**GAD**
Parent-reported ODD				
IED	.04	.02	−.01	−.01
ODD symptoms	.66***	.59***	.40***	.45***
IED × ODD	.22*	.17	.15	.12
Teacher-reported ODD				
IED	.21	.04	.02	.12
ODD symptoms	.29**	.31**	.32**	.17
IED × ODD	.16	.36**	.25*	.05

Note. Coefficients are standardized Beta weights. Sex, age, and income were entered in Step 1. IED = Intra/Extra Dimensional Set Shift number of stages completed, ODD = oppositional defiant disorder symptoms, CD = conduct disorder symptoms, MDD = major depressive disorder symptoms, GAD = generalized anxiety disorder symptoms.

* $p < .05$,

** $p < .01$,

*** $p < .001$.