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Social Competence and Social Support as Mediators between Comorbid Depressive and Conduct Problems and Functional Outcomes in Middle School Students

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Abstract

This study examined the roles of social competence and social support as potential mediators of the association between psychopathology and functional outcomes in a middle school sample (n=521). Participants were stratified into four psychopathology risk groups (depression only, conduct problems only, comorbid depression and conduct problems, low symptoms) based on screening during early 6th grade. Functional outcomes were 6th grade point average (GPA) and parent rating of global adaptive functioning in their 7th grade student. Low levels of social competence were found to mediate the association between psychiatric symptoms and both lower grades and global functioning, for adolescents with depressive symptoms alone and with comorbid symptoms, but not for those with conduct problems alone. Lack of social support mediated the association between symptoms and lower grades for adolescents with depression alone and comorbid symptoms, but not those with conduct problems alone. These findings suggest that intervention to improve social competence and social support may enhance functional outcomes, especially for youth with depressive symptoms or comorbid depressive and conduct symptoms.

Keywords

adolescent; depression; conduct problems; comorbidity; social competence; social support; academic function; global function

For adolescents, having a combination of depressive and conduct problems is more common than having either depressive or conduct problems alone (Zoccolillo, 1992). General population studies of adolescents have found a prevalence of depression without conduct disorder ranging between 0.4 and 8.7%, while prevalence of depression with conduct disorder ranged from 15 to 23.9% (Zoccolillo, 1992). Adolescents with this type of comorbidity are at high risk for poor clinical trajectories (Beyers & Loeber, 2003; Fombonne, Wostear, Cooper, Harrington, & Rutter, 2001; Weiss, Susser, & Catron, 1998), depression recurrence after treatment (Rohde, Clarke, Lewinsohn, Seeley, & Kaufman, 2001); suicide attempts (Fombonne et al., 2001; Lewinsohn et al., 1995); and adult criminal behavior (Copeland, Miller-Johnson, Keeler,

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Angold, & Costello, 2007; Sourander et al., 2007). Better understanding of the factors that contribute to poor outcomes is needed to shape effective intervention and prevention strategies.

Depression and conduct problems are both associated with lower levels of academic achievement (Capaldi & Stoolmiller, 1999; Marmorstein & Iacono, 2004) and lower levels of global functioning (Goodman, Schwab-Stone, Lahey, Shaffer, & Jensen, 2000), and the effect of the combination of depression and conduct problems on academic, social and global functioning appears to be more than additive (Ezpeleta, Domenech, & Angold, 2006; Ingoldsby, Kohl, McMahon, & Lengua, 2006; Lewinsohn, Rohde, & Seeley, 1995; Marmorstein & Iacono, 2003).

A strong and consistent association has been found between depression and lower social competence (Cole, Martin, Powers, & Truglio, 1996; McCauley et al., 1993); and between conduct problems and lower social competence (Keiley, Lofthouse, Bates, Dodge, & Petit, 2003; Kim et al., 2003). Adolescents with comorbid depression and conduct problems have been found to have lower social competence than those with either problem alone (Ezpeleta, Domenech, & Angold, 2006; Ingoldsby, Kohl, McMahon, & Lengua, 2006; Lewinsohn, Rohde, & Seeley, 1995). Low social competence has been demonstrated to be associated with lower academic performance (Cole, Martin, Powers, & Truglio, 1996; Fleming et al., 2005; Wentzel, 1991, 1993) and lower global functioning (Grey, Boland, Davidson, Li, & Tamborlane, 2000).

Studies have shown significant associations between depression and lower social support (Bell-Dolan, Reaven, & Peterson, 1993; Bergeron et al., 2007; Young, Berenson, Cohen, & Garcia, 2005); and between conduct problems and lower social support (Appleyard, Egeland, & Sroufe, 2007). Lower social support has been demonstrated to be associated with lower academic performance (Heard, 2007; Stone, 2006) and lower global functioning (Crosnoe & Elder, 2004).

Although the role of social competence and social support in mediating the association between psychiatric symptoms and academic and global functioning has not been examined directly, the positive impact of intervention for conduct problems through parent education and training suggests such mediation (e.g., Bierman, 2002). Little and Garber (2005) demonstrated that among youth with conduct problem symptoms, those with interpersonal problems (e.g., conflicts with peers, suspensions from school) were more likely to develop depressive symptoms. These results suggest that social competence and social support are important in the development and maintenance of comorbid psychiatric symptoms over time.

There is also a considerable literature supporting a developmental pathway whereby social competence and social support reduce the occurrence of depressive and conduct problem symptoms (e.g., Cole, Martin, Powers, & Truglio, 1996; McCauley et al., 1993). Other studies have shown that lack of social competence and social support are predictive of increases in depressive and conduct problem symptoms over the course of development (Bergeron et al., 2007; Young, Berenson, Cohen, & Garcia, 2005). The current study examines a pathway whereby psychiatric symptoms precedes the weakening of social ties and diminishing of social competence which in turn lead to poor adaptive functioning. Our goal is to examine the role of social competence and social support in shaping the academic performance and global functioning of adolescents who are already exhibiting psychiatric symptoms. We test the hypothesis that poor social competence and low social support help to explain why young adolescents with comorbid depression and conduct problems experience poor functional outcomes.

Method

Screening Participants and Measures

Four middle schools (6th – 8th grades) in a northwestern city screened incoming sixth grade students for self-reported depressive and conduct symptoms from 2001 to 2004 in a community-based epidemiological study. The screening questionnaire was administered in classrooms by trained study staff (lead study staff in each classroom had bachelor's degree, assisted by staff with minimum of two years of college) during a 50-minute class period. The classroom teacher passed out screening packets then sat at a desk during screening to ensure privacy. Seventy-one percent of eligible 6th graders (N=2,187) obtained parental consent and assented to screening. All students with high depression and conduct problem screening scores received a brief clinical assessment at school by an experienced master's degree level mental health professional who and made an action plan with the student and parent regarding referrals for mental health services as needed and / or other resources (Vander Stoep et al., 2005).

Depressive Symptoms—The Mood and Feelings Questionnaire (MFQ) (Angold & Costello, 1987), a 33-item self-report depression scale with demonstrated high test-retest reliability and good convergent validity (Davis, Birmaher, Melhem et al, 2006), was used to assess depressive symptoms in the past two weeks. Three suicide items were removed from the 33-item version due to ethical concerns. Internal consistency reliability of the 30-item MFQ was very high ($\alpha = .92$). The screening sample Mean (SD) was 10.4 (9.5), which is very similar to that reported in a large sample of Norwegian adolescents (Sund, Larsson & Wichstrom, 2001).

Conduct Problem Symptoms—Conduct problem symptoms were assessed with the 30-item externalizing dimension scale of the Youth Self-Report (YSR) (Achenbach, 1991), in which youth reported how true each item was for them in the past six months. Content, criterion-related, and construct validity of the YSR has been demonstrated in diverse populations (Achenbach, 1991). Internal consistency reliability of the YSR externalizing scale was very high ($\alpha = .90$). The screening sample Mean (SD) was 7.5 (7.3), which is lower than CBCL externalizing subscale means found large epidemiologic studies in Sweden (Broberg et al., 2001) and Norway (Dahl et al., 2006), which both had means of about 13.

Cohort Participants

Longitudinal study participants (N=521) were randomly selected from the four psychopathology risk groups in the ratio of 2 at low risk for psychopathology (NEITHER): 1 with elevated depressive symptoms only (DEPRESSED ONLY): 1 with elevated conduct problem symptoms only (CONDUCT ONLY): 1 with comorbid depressive and conduct problem symptoms (COMORBID). The cohort was comprised of 252 (48.4%) girls and 269 (51.6%) boys. There were 229 (43.9%) Caucasian, 135 (25.8%) African, 135 (25.8%) Asian, and 23 (4.4%) Native American youth. Fifty-two (10.1%) students were of Hispanic ethnic origin.

Adolescents in the NEITHER group (N= 209; 106 boys, 103 girls) had scores < 0.5 SD below the sample mean score on both the MFQ and YSR externalizing scale (<15 on the MFQ and <12 on the YSR); youth in the CONDUCT ONLY group (N=81; 54 boys, 27 girls) had scores \geq 0.5 SD above the sample mean on the YSR but < 0.5 SD of the sample mean score on the MFQ; adolescents in the DEPRESSED ONLY group (N=107; 49 boys, 58 girls) had scores \geq 0.5 SD above the sample mean on the MFQ but < 0.5 SD of the sample mean score on the YSR; and youth in the COMORBID group (N=124; 65 boys, 59 girls) had scores \geq 0.5 SD above the sample mean on both the MFQ and YSR. Each non-participant was replaced with

another 6th grade student randomly selected from the same psychopathology group until the target cohort size of 521 participants was reached.

Baseline in-home interviews were conducted with the adolescent and a parent/guardian 2-3 months after screening. Two trained interviewers administered a battery of questionnaires to the adolescent and parent, separately and in private, to assess the adolescent's mental health status as well as antecedents and outcomes of childhood psychopathology. Follow-up interviews were conducted 6 and 12 months after the baseline interview, when the adolescent was in late 6th grade and early 7th grade, respectively. In addition, students nominated one academic teacher who knew them well who was asked to complete the Teacher Report Form (Achenbach & Edelbrock, 1986).

Cohort Measures

Social Competence—Measures of social competence were based on the Childhood Behavioral Checklist 4-18 (CBCL 4-18) (Achenbach, 1991); and the Teacher Report Form (Achenbach & Edelbrock, 1986), administered early in 6th grade. Both measures have demonstrated high reliability and validity across numerous research studies (Achenbach, 1991; Achenbach & Edelbrock, 1986).

The individual items from the CBCL Social Competence, CBCL Social Problems, and Teacher Report Form (TRF) Social Problems subscales were used in a principal components analysis with promax rotation, to attempt to improve the low internal consistency reliability ($\alpha=.53$) when the subscales were combined in their entirety. Promax rotation was used due to the known correlation between items. The two resulting factors had eigenvalues of 4.03 and 1.79, and together explained 48.5% of the variance. The first factor: *Teacher Report of Social Competence* (with lower scores indicating higher social competence), had $\alpha=.81$ and included six items from the TRF (with factor loadings): 1) the child is not liked (.81), 2) does not get along well with others (.78), 3) is teased (.75), 4) thinks others are out to get him or her (.71), 5) is clumsy (.58), and 6) is jealous (.65). 43 participants had missing data for this variable. The second factor, *Parent Report of Social Competence* (with lower scores indicating higher social competence), $\alpha=.72$, consisted of four CBCL items: 1) does not get along with others (.80), 2) is not liked (.80), 3) is teased (.72), and 4) prefers younger children (.64).

Teacher and parent report of lower social competence were modestly correlated with one another (Pearson $r=.32$, $p<.001$). Due to their unique factor loadings, they were examined separately in regression analyses.

Social Support—The dataset included multiple measures of social support, all measured early in 6th grade: 1) the Family Involvement Questionnaire (FIQ), a component of the Child Health and Illness Profile (CHIP-AE; Riley et al., 1998), $\alpha=.87$ in this sample; 2) the Perceived Social Support (PSS) scale (Procidano & Heller, 1983), which assesses perceived support from friends and family with separate 20-item subscales, $\alpha=.88$ for the friends subscale and $\alpha=.90$ for the family subscale; 3) the Social Support Scale for Children and Adolescents (SSSCA) (Harter, 1985), a 24-item scale that assessed youth's perceptions of social support from four sources: parents, classmates, teachers, and close friends, with 6 items for each source ($\alpha=0.79$, 0.80, 0.54, and 0.83, respectively).

A principal components analysis with promax rotation of standardized scores from the FIQ, SCC, and SSSCA subscales was used to combine subscales into factors. The first two factors had eigenvalues of 3.56 and 1.27, and together explained 60.4% of the variance. The first component, *Perceived Friend Support*, ($\alpha=0.79$, consisted of four subscales (with factor loadings): PSS Friend Support Subscale (0.97), SSSCA Close Friend Support Subscale (0.81), PSS Special Person Support Subscale (0.70), and SSSCA Classmate Support Subscale (0.53).

The second component, *Perceived Family / Teacher Support*, ($\alpha=0.74$) consisted of four subscales: SSSCA Parent Support Subscale (0.86), PSS Family Support Subscale (0.73), FIQ Mean Score (0.77), and SSSCA Teacher Support Subscale (0.57). The correlation between the *Perceived Friend Support* and *Perceived Family/Teacher Support* scales was moderate ($r=0.53$, $p<.001$). Since these two forms of support formed separate factors and are conceptually distinct, they were examined separately in regression models.

Academic Performance—Cumulative grade point average (GPA) on a 4-point scale across two semesters of 6th grade provided by the school district was used as a continuous outcome variable. The mean (SD) GPA for the cohort sample was 3.07 (0.87).

Parent-Rated Global Functioning—The Columbia Impairment Scale (CIS) (Bird et al., 1996), a 13-item scale administered to a parent of the youth during the initial interview and the 12-month follow-up. The CIS addresses several areas of functioning: interpersonal relations, functioning in school, and use of leisure time. Items all begin with the phrase: “In general, how much of a problem would you say your child has with: ...” Item endings include: getting into trouble, his behavior at school (or job), getting involved in activities like sports or hobbies, and his / her behavior at home. The scale has good construct, discriminant, and concurrent validity (Bird et al., 1996). The total 7th grade global functioning score ($\alpha=.85$) was used as a continuous measure (Bird et al., 1996), with a lower score indicating better functioning.

Statistical Analyses

Symptom Scores in Psychopathology Risk Groups—Analyses of variance (ANOVAs) were used to compare mean externalizing scores and depression scores across psychopathology risk groups. Since the groups were defined by externalizing scores and depression scores, differences between groups were expected. Of interest, however, was whether the comorbid symptom group differed from each single-symptom group on the measure used to define that symptom. Therefore, independent sample t-tests with equal variances not assumed were used to compare the CONDUCT ONLY group to the COMORBID group on mean externalizing scores, and to compare the DEPRESSED ONLY group to the COMORBID group on mean depression score. In addition, to examine risk group membership in relation to clinical severity, Chi-square comparisons were made of the percentage of participants in the CONDUCT ONLY versus COMORBID psychopathology risk groups who had an externalizing score of ≥ 1.5 SD above the screening sample mean; and of the percentage of participants in the DEPRESSED ONLY versus COMORBID psychopathology risk groups who had a depression score of ≥ 1.5 SD above the screening sample mean.

Implementation of the Mediator Hypothesis—A variable may be considered a mediator if it “carries the influence of a given independent variable (IV) to a given dependent variable (DV)” (Baron & Kenny, 1986). Social competence and social support were examined as potential mediators of the association between psychopathology and functional outcomes, using four steps: 1) linear regression (mathematically equivalent to the use of a multivariate analysis of covariance (MANCOVA)) in which the DV was the functional outcome of interest (i.e., school grades or global functioning) and the IV was the psychopathology risk groups entered as “dummy variables” with the NEITHER group as the referent category; 2) linear regression in which the DVs were the social competence and social support variables, with one regression performed for each potential mediator variable, and the IV was the set of psychopathology risk groups in “dummy variable” form; 3) linear regression in which the DV was the functional outcome (i.e., school grades or global functioning), and IVs included psychopathology risk groups and each regression included one of the four potential mediating variables; 4) calculation of the Sobel test to examine whether addition of the social competence

or social support variable significantly reduced the association between the risk group and the functional outcome.

Covariates—The following variables: age, sex, family income, and race (using dichotomized variables for African, Asian, and Native American race, with Caucasians as the referent group), were used as covariates in all models as a block prior to entry of the variables of interest. In addition, for models in which 7th grade global functioning was the outcome considered, a dichotomous variable indicating whether the adolescent had low global functioning (CIS>15) in 6th grade was used as a covariate. Each of these factors has been shown to be related to both psychiatric symptom scores and level of function in adolescence, or to social skills and social support. For example, the incidence of conduct problems, depressive symptoms, and their co-occurrence generally increase from childhood to adolescence (Anderson, Williams, McGee, & Silva, 1987), and levels of adaptive and maladaptive behavior change with age (Achenbach, 1991); adolescent girls have higher rates of depression and boys have higher rates of conduct problems during adolescence (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003). Children's mental health status and parent-child interaction styles are associated with family income (Costello, Compton, Keeler & Angold, 2003; Tracy, Zimmerman, Galea, McCauley & Vander Stoep, in press; Garner, Jones, & Miner, 1994) and neighborhood (Levinthal & Brooks-Gunn, 2003). Among adolescents racial differences are found in both rates of psychiatric illness (McLaughlin, Hilt, & Nolen-Hoeksema, 2007) and level of academic function (Bacharach, Baumeister, & Furr, 2003; Cox, Zhang, Johnson, & Bender, 2007). Finally, known prior level of function is highly related to future level of function within populations of young adolescents with psychiatric illness (Ingoldsby et al., 2006). Therefore, our strategy of using these variables as covariates is designed to avoid potential confounding. Limitations of power precluded us from carrying out subgroup analyses.

All analyses were conducted using sampling fraction weights such that the longitudinal sample was comparable to the screened sample with regard to depressive and conduct problems, sex, race, ethnicity, and educational program (i.e, regular education, special education, or gifted education). For two key variables: 6th grade teacher report of lower social competence and 7th grade global functioning, 10-15% of subjects had missing data. Parent-report on CBCL and adolescent-rated social support measures each had 1-2% of subjects with missing data. For the analyses presented, groups were made complete by imputing missing variables based on sex, race, family income, and psychopathology risk group. Results were similar to analyses using listwise deletion of cases, which are not presented. Analyses were performed using SPSS Version 13.0, and alpha level of $p=.05$ was used to denote statistical significance.

Results

Comparison of Symptom Severity

Significant differences were found among psychopathology risk groups on the YSR externalizing scale, with the highest mean score reported by the comorbid group (NEITHER $M=3.28$, $SD=2.65$; CONDUCT ONLY $M=13.29$, $SD=3.92$; DEPRESSED ONLY $M=4.63$, $SD=2.59$; COMORBID $M=15.01$, $SD=5.64$), $F(3, 517)=335.41$, $p<.001$). Follow-up independent samples t-tests with equal variance not assumed indicated that the COMORBID group had a significantly higher mean YSR externalizing score than the CONDUCT ONLY group, $t(1, 203)=2.58$, $p=.01$. Similarly, psychopathology risk group differed significantly on mean MFQ scores (NEITHER $M=5.18$, $SD=3.88$; CONDUCT ONLY $M=7.26$, $SD=3.37$; DEPRESSED ONLY $M=18.18$, $SD=5.74$; COMORBID $M=22.97$, $SD=8.51$), $F(3, 517)=319.34$, $p<.001$). T-tests indicated that the COMORBID group had a significantly higher mean score than the DEPRESSED ONLY group, $t(1, 229)=5.08$, $p<.001$.

We conducted a supplementary analysis to examine the association between psychopathology risk group membership and clinical severity, using a cutoff value of 1.5 sd above the sample YSR and MFQ means. Chi-square analysis demonstrated that a higher percentage of participants in the COMORBID group than in the CONDUCT ONLY group had a YSR externalizing score of ≥ 1.5 SD above the screening sample mean, 26 (24%) in the DEPRESSED ONLY group, and 62 (50%) in the COMORBID group, $\chi^2(1) = 10.04$, $p = .002$. Similarly, a higher percentage of youth in the COMORBID group than in the DEPRESSED ONLY group had MFQ scores that were ≥ 1.5 SD of the screening sample mean, 18 (22%) in the DEPRESSED ONLY group and 53 (43%) in the COMORBID group, $\chi^2(1) = 16.01$, $p < .001$.

Examination of the Mediation Model

Table 1 shows means and standard deviations of proposed mediator variables and outcome variables by psychopathology risk group and sex. Table 2 shows the results of the first step of the mediation model. We found significant associations between school grades and each psychopathology risk group, compared to the NEITHER group, with the highest level of significance found for the COMORBID group. We found significant associations between both conduct problem and comorbid symptoms and parent-rated functional problems, but not between depressive symptoms and parent-rated functional problems. The lack of an association between depressive symptoms and global functioning indicated that we could not test for mediation of the association between depressive symptoms and global functioning by social competence or social support.

Examination of the covariates entered in Step 1 revealed that girls had higher grades than (β (SE) = -.40 (.07), $t(508) = -6.11$, $p < .001$), higher income was associated with higher grades ($\beta = .06$ (.01), $t(508) = 4.30$, $p < .001$); Native American race ($\beta = -.84$ (.17), $t(508) = -5.00$, $p < .001$), and Black race (β (SE) = -.72 (.10), $t(508) = -7.58$, $p < .001$) were each associated with lower grades. Seventh grade global functioning was positively associated with 6th grade global functioning (β (SE) = 7.99 (.70), $t(508) = 11.44$, $p < .001$), and Asian race was associated with higher global functioning (β (SE) = -1.85 (.69), $t(508) = -2.67$, $p = .008$).

Table 3 presents step 2 of the mediation model, using the NEITHER group as the reference. Results indicated a positive association between teacher-reported lower social competence in the comparison between the COMORBID and NEITHER groups. We did not, however, find significant associations between teacher-reported lower social competence and membership in either the DEPRESSED ONLY or CONDUCT ONLY groups.

Both perceived friend/peer support and family/teacher social support were negatively associated with membership in the DEPRESSED ONLY group and COMORBID group, each in comparison with the NEITHER group. Friend/peer support did not differ significantly between CONDUCT ONLY and NEITHER groups, but the CONDUCT ONLY group reported significantly less family/teacher support than the NEITHER group. Supplementary independent sample t-tests to examine whether youth in the COMORBID group reported significantly lower friend/peer or family/teacher social support than youth in single symptom groups revealed that the COMORBID group reported significantly less friend/peer support than the CONDUCT ONLY group ($t(1, 203) = 2.94$, $p < .001$); and less family/teacher support than each other group (DEPRESSED ONLY: $t(1, 229) = -3.50$, $p = .001$; CONDUCT ONLY: $t(1, 203) = 3.98$, $p < .001$). DEPRESSED ONLY and COMORBID groups did not differ on their reports of support from friends/peers ($t(1, 229) = -1.38$, $p = .17$).

Examination of the covariates entered in Step 1 indicated that higher income was associated with higher parent-rated (β (SE) = -.02 (.01), $t(508) = -2.66$, $p = .01$) and teacher-rated social competence (β (SE) = -.01 (.01), $t(508) = -2.19$, $p = .03$). In addition, parents rated girls higher than boys on social competence (β (SE) = .06 (.03), $t(508) = 2.30$, $p = .02$). Black and Asian youth

reported less support from friends and from parents than youth in other racial groups (Friend support: Black β (SE)=-.25 (.10), t (508)=-2.51, p =.01; Asian (β (SE)=-.32 (.09), t (508)=-3.66, p <.001; Parent support: (Black β (SE)=-.29 (.09), t (508)=-3.13, p =.002; Asian β (SE)=-.31 (.08), t (508)=-3.65, p <.001). Girls reported more support from friends than boys (β (SE)=-.44 (.07), t (508)=-6.46, p <.001), and higher income was associated with more perceived family support (β (SE)=.05 (.01), t (508)=3.50, p =.001).

Steps 3 and 4 in the mediation model are summarized in Tables 4 and 5. Table 4 shows that each of the potential lower social competence and social support mediators explained a significant portion of the association between poor academic performance and COMORBID symptoms in comparison with the NEITHER group, and between DEPRESS and NEITHER groups. The β for the association between COMORBID risk group and school grades were reduced by 16% by the addition to the model of teacher-reported lower social competence, by 13% for parent-reported lower social competence, by 18% for youth-reported friend / peer social support, and by 29% for family / teacher social support. These results suggest that the added burden of lower social competence in the context of COMORBID or DEPRESSIVE symptoms was associated with subsequent lower grades, and that the lowering of grades associated with COMORBID or DEPRESSIVE symptoms was partially explained by lower social competence. Similarly, youth with COMORBID or DEPRESSIVE symptoms who lacked social support were more likely than low-symptom peers to achieve low grades, and the association between COMORBID symptoms and lower grades was partially explained by lack of social support. Use of the Sobel test to examine mediation of the association between conduct problems and school grades was only applicable for family / teacher support because the criteria set forth by Baron and Kenny (1986) were not met in an earlier step for each of the potential mediating variables, and family / teacher support was not a significant mediator of the association between CONDUCT ONLY symptoms and low grades.

Table 5 shows that the association between the COMORBID psychopathology risk group and global functioning was mediated by lower social competence, as reported by both teachers and parents. Social support did not significantly mediate the association between COMORBID psychopathology risk group and lower global functioning, and did not significantly mediate the association between CONDUCT ONLY group membership and parent-reported global functioning.

Supplementary Analyses to Address Symptom Severity

A difficult but important question to address is whether the differences found for the COMORBID group in comparison with single-symptom groups is more strongly related to the number and severity of symptoms or to the particular mix of symptoms in the COMORBID group. Adolescents in the COMORBID group have higher symptom scores, as well as a distinctive combination of heterotypic symptoms compared to adolescents with elevated depression or conduct problem symptoms only. To partial out the influence of the number and severity of symptoms from that of symptom mix, we performed a supplementary analysis in which youth in the single-symptom groups with the lowest score on that symptom were systematically eliminated until the group mean scores were rendered equal to the mean scores of youth in the COMORBID group. The analyses were re-run with the smaller and more severely DEPRESSED ONLY group (n =45), and then with the smaller and more severe CONDUCT ONLY group (n =48).

Controlling for depressive symptom severity resulted in a loss of the findings of social competence and social support mediating the association between DEPRESSIVE symptoms and grades, and a new finding that social support mediated the association between COMORBID symptoms and global functioning. Controlling for conduct problem symptom severity resulted in continued findings that social competence and social support mediated the

association between COMORBID symptom and grades, and a lessening of strength of mediation between social competence and global functioning for the COMORBID group. These results do not suggest that depressive symptom severity was an explanation for the mediation findings, because if so equalizing symptom severity between groups would be expected to either increase in the strength of mediation for the DEPRESS ONLY group or a diminish of the mediation of the association for the COMORBID group, neither of which was found. Controlling for CONDUCT symptom severity, in contrast, suggests that the difference in symptom severity between the CONDUCT ONLY and COMORBID groups was at least a partial explanation for the finding that social competence mediates the association between COMORBID symptoms and global functioning.

Discussion

Overall, this study showed that social competence and social support mediated the association between comorbid psychiatric symptoms and low grades, social competence and social support mediated the association between depressive symptoms and low grades, and social competence mediated the association between comorbid psychiatric symptoms and global functioning. Our findings are consistent with studies in the youth (Hurtig et al., 2007; Ingoldsby et al., 2006) and adult (McDermut, Mattia, & Zimmerman, 2001) psychopathology literatures that show that people who have two or more psychiatric conditions simultaneously tend to have greater severity of both symptoms and functional impairment than those with symptoms of one psychiatric disorder alone. This study adds to the literature the finding that for the group of adolescents who have comorbid depressive and conduct problem symptoms, lower social competence and social support explain a significant amount of their related functional impairment.

A key question this study raises is why social competence and social support mediate more strongly between symptoms and function for the youth with comorbid symptoms than youth with depression alone or conduct problems alone. We showed with our supplementary analyses that the mediation effect was not due to the higher severity of depressive symptoms that the comorbid group has in comparison with group with depressive symptoms alone, but the increased severity of symptoms in the COMORBID compared to CONDUCT group did partly explain the finding that social competence mediated the association between comorbid symptoms and global functioning. Overall, our findings corroborate other studies that found youth with comorbid symptoms to exhibit poorer function than youth with single symptoms, (e.g., Ezpeleta et al., 2006; Ingoldsby et al., 2006). Additionally, our study showed that youth with comorbid depressive and conduct problem symptoms displayed lower social competence and had less social support than youth with depressive or conduct problems symptoms only and that the association between low social competence and support and poor functional outcomes was stronger in the comorbid group than the other groups. Thus, low social competence and social support comprise not only risk factors for the development of comorbid symptoms, but also a pathway to poor functional outcomes among youth with comorbid symptoms.

For middle school students with depressive symptoms alone, mediation was found only for the association between depressive symptoms and grades, but not for the association between depressive symptoms and global functioning. This study did not find an association between depression and global functioning, in contrast with prior studies. This study differs from other studies that have found links between depression and global function in multiple ways that may explain the discrepancy in findings. Unlike Goodman et al, 2000 we divided youth with elevated depression scores into two subgroups: DEPRESSED ONLY from COMORBID youth (Goodman et al., 2000). The subgroup without comorbid conduct problems would be expected to have higher adaptive functioning. Unlike Ezpeleta et al, 2006 parent-reported global

functioning was measured approximately one year after the assessment of psychiatric symptoms in this study, rather than concurrently (Ezpeleta et al., 2006); we included a low-symptom comparison group; and we sampled from the community, which may yield weaker associations between symptoms and functional outcomes than studies of clinical samples. To date depressive symptoms have only been associated with lower functioning in youth older than 6th grade (e.g., Goodman et al., 2000). Our findings suggest that youth with depressive symptoms in 6th grade are functioning at a near-normal level and that preservation of their high level of function should be a priority of research and intervention.

The mediation model was not applicable to youth with conduct problem symptoms only because that group did not lack social competence nor have lower levels of support from friends. Other research suggests that having a deviant peer group (Lacourse et al., 2006) and using substances (Fergusson, Horwood, & Ridder, 2007) may contribute to poor function in youth with conduct problems.

The difference between parent and teacher report of lower social competence for the youth with depression only highlights informant differences in perspectives on adolescents. For the depression only group, teachers did not observe lower social competence in comparison with low symptom peers, but parents did. This finding fits with our knowledge that the social demands and expectations of the parent-child relationship are much more complicated than those of a teacher-child relationship.

Limitations

The present study, in which a “high risk” cohort was selected from a community sample, may not be generalizable to clinical samples. However, community-based samples provide important information about the differences between psychopathology risk groups and low-symptom groups that is unique from information provided by clinical samples.

While this study controlled for global functioning in early 6th grade when considering the outcome of parent-reported global functioning in 7th grade, no such control was possible for academic performance because we did not have access to 5th grade GPA. In contrast, Ingoldsby et al. (2006) examined 7th grade GPA controlling for 5th grade GPA. Despite this methodological difference, there is consistency between the two studies in finding that academic dysfunction was most characteristic of youth in the comorbid symptom group.

Implications

These findings support inclusion of social skills and social support bolstering in prevention and interventions efforts addressed to youth with depressive symptoms and comorbid depressive symptoms and conduct problems.

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References

Achenbach, T.M. Manual for the child behavior checklist/4-18 and 1991 profile. Burlington, VT: University of Vermont; 1991.

- Achenbach, TM.; Edelbrock, SC. Manual for the Teacher's Report Form and Teachers Version of the Child Behavior Profile. Vermont: Department of Psychiatry, University of Vermont; 1986.
- Anderson JC, Williams S, McGee R, Silva PA. DSM-III disorders in preadolescent children. Prevalence in a large sample from the general population. *Archives of General Psychiatry* 1987;44:69–76. [PubMed: 2432848]
- Angold, A.; Costello, EJ. Mood and Feelings Questionnaire (MFQ). Durham, N.C.: Developmental Epidemiology Program, Duke University; 1987.
- Appleyard K, Egeland B, Sroufe LA. Direct Social Support for Young High Risk Children: Relations with Behavioral and Emotional Outcomes across Time. *Journal of Abnormal Child Psychology* 2007;35:443–457.
- Bacharach V, Baumeister A, Furr R. Racial and gender science achievement gaps in secondary education. *J Genetic Psychology* 2003;164:115–126.
- Baron RM, Kenny DA. The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology* 1986;51:1173–1182. [PubMed: 3806354]
- Bell-Dolan DJ, Reaven NM, Peterson L. Depression and Social Functioning: A Multidimensional Study of the Linkages. *Journal of Clinical Child Psychology* 1993;22:306–315.
- Bergeron L, Valla JP, Smolla N, Piche G, Berthiaume C, St-Georges M. Correlates of Depressive Disorders in the Quebec General Population 6 to 14 Years of Age. *Journal of Abnormal Child Psychology* 2007;35:459–474. [PubMed: 17295062]
- Beyers JM, Loeber R. Untangling developmental relations between depressed mood and delinquency in male adolescents. *Journal of Abnormal Child Psychology* 2003;31:247–266. [PubMed: 12774859]
- Bierman KL. The implementation of the Fast Track program: an example of a large-scale prevention science efficacy trial. *Journal of Abnormal Child Psychology* 2002;30:1–17. [PubMed: 11930968]
- Bird H, Andrews H, Schwab-Stone M, Goodman S, Dulcan M, Richters J, et al. Global measures of impairment for epidemiologic and clinical use with children and adolescents. *International Journal of Methods in Psychiatric Research* 1996;6:295–307.
- Broberg AG, Ekeroth K, Gustafsson PA, Hansson K, Hagglof B, Ivarsson T, et al. Self-reported competencies and problems among Swedish adolescents: a normative study of the YSR. *Youth Self Report. European Child and Adolescent Psychiatry* 2001;10:186–193. [PubMed: 11596819]
- Capaldi DM, Stoolmiller M. Co-occurrence of conduct problems and depressive symptoms in early adolescent boys: III. Prediction to young-adult adjustment. *Development and Psychopathology* 1999;11:59–84. [PubMed: 10208356]
- Cicchetti D, Toth SL. The development of depression in children and adolescents. *American Psychologist* 1998;53:221–241. [PubMed: 9491749]
- Cole DA, Martin JM, Powers B, Truglio R. Modeling causal relations between academic and social competence and depression: a multitrait-multimethod longitudinal study of children. *Journal of Abnormal Psychology* 1996;105:258–270. [PubMed: 8723007]
- Columbia University DISC Development Group. DISC-IV Diagnostic Interview Schedule for Children. New York: 1998.
- Copeland WE, Miller-Johnson S, Keeler G, Angold A, Costello EJ. Childhood psychiatric disorders and young adult crime: a prospective, population-based study. *American Journal of Psychiatry* 2007;164:1668–1675. [PubMed: 17974931]
- Costello EJ, Compton SN, Keeler G, Angold A. Relationships between poverty and psychopathology: A natural experiment. *Journal of the American Medical Association* 2003;290:2023–2029. [PubMed: 14559956]
- Costello EJ, Mustillo S, Erkanli A, Keeler G, Angold A. Prevalence and development of psychiatric disorders in childhood and adolescence. *Archives of General Psychiatry* 2003;60:837–844. [PubMed: 12912767]
- Cox RG, Zhang L, Johnson WD, Bender DR. Academic performance and substance use: findings from a state survey of public high school students. *Journal of School Health* 2007;77:109–115. [PubMed: 17302852]
- Crosnoe R, Elder GHJ. From childhood to the later years: Pathways of human development. *Research on Aging* 2004;26:623–654.

- Dahl LB, Kaaresen PI, Tunby J, Handegard BH, Kvernmo S, Ronning JA. Emotional, behavioral, social, and academic outcomes in adolescents born with very low birth weight. *Pediatrics* 2006;118:e449–459. [PubMed: 16882786]
- Davis WB, Birmaher B, Melhem NA, Axelson DA, Michaels SM, Brent DA. Criterion validity of the Mood and Feelings Questionnaire for depressive episodes in clinic and non-clinic subjects. *Journal of Child Psychology and Psychiatry* 2006;47:927–934. [PubMed: 16930387]
- Ezpeleta L, Domenech JM, Angold A. A comparison of pure and comorbid CD/ODD and depression. *Journal of Child Psychology and Psychiatry* 2006;47:704–712. [PubMed: 16790005]
- Fergusson DM, Horwood LJ, Ridder EM. Conduct and attentional problems in childhood and adolescence and later substance use, abuse and dependence: results of a 25-year longitudinal study. *Drug and Alcohol Dependence* 2007;88:S14–26. [PubMed: 17292565]
- Fleming CB, Haggerty KP, Catalano RF, Harachi TW, Mazza JJ, Gruman DH. Do social and behavioral characteristics targeted by preventive interventions predict standardized test scores and grades? *Journal of School Health* 2005;75:342–349. [PubMed: 16255720]
- Fombonne E, Wostear G, Cooper V, Harrington R, Rutter M. The Maudsley long-term follow-up of child and adolescent depression. 1. Psychiatric outcomes in adulthood. *British Journal of Psychiatry* 2001;179:210–217. [PubMed: 11532797]
- Garner PW, Jones DC, Miner JL. Social competence among low-income preschoolers: emotion socialization practices and social cognitive correlates. *Child Development* 1994;65(2 Spec No):622–637. [PubMed: 8013243]
- Goodman SH, Schwab-Stone M, Lahey BB, Shaffer D, Jensen PS. Major Depression and Dysthymia in Children and Adolescents: Discriminant Validity and Differential Consequences in a Community Sample. *Journal of the American Academy of Child and Adolescent Psychiatry* 2000;39:761–770. [PubMed: 10846311]
- Grey M, Boland EA, Davidson M, Li J, Tamborlane WV. Coping skills training for youth with diabetes mellitus has long-lasting effects on metabolic control and quality of life. *Journal of Pediatrics* 2000;137:107–113. [PubMed: 10891831]
- Harter, S. *Manual for the Self-Perception Profile for Children*. Denver: University of Denver; 1985.
- Heard HE. The family structure trajectory and adolescent school performance: Differential effects by race and ethnicity. *Journal of Family Issues* 2007;28:319–354.
- Hurtig T, Ebeling H, Taanila A, Miettunen J, Smalley S, McGough J, et al. ADHD and comorbid disorders in relation to family environment and symptom severity. *European Child and Adolescent Psychiatry* 2007;16:362–369. [PubMed: 17401612]
- Ingoldsby EM, Kohl GO, McMahon RJ, Lengua L. Conduct problems, depressive symptomatology and their co-occurring presentation in childhood as predictors of adjustment in early adolescence. *Journal of Abnormal Child Psychology* 2006;34:603–621. [PubMed: 16967336]
- Keiley M, Lofthouse N, Bates J, Dodge KA, Petit G. Differential risks of covarying and pure components in mother and teacher reports of externalizing and internalizing behavior across ages 5 to 14. *Journal of Abnormal Child Psychology* 2003;31:267–283. [PubMed: 12774860]
- Kim IJ, Ge X, Brody GH, Conger RD, Gibbons FX, Simons RL. Parenting behaviors and the occurrence and co-occurrence of depressive symptoms and conduct problems among African American children. *Journal of Family Psychology* 2003;17:571–583. [PubMed: 14640806]
- Lacourse E, Nagin DS, Vitaro F, Cote S, Arseneault L, Tremblay RE. Prediction of early-onset deviant peer group affiliation: a 12-year longitudinal study. *Archives of General Psychiatry* 2006;63:562–568. [PubMed: 16651513]
- Larson RW, Richards MH, Moneta G, Holmbeck G, Duckett E. Changes in adolescents' daily interactions with their families from ages 10 to 18: Disengagement and transformation. *Developmental Psychology* 1996;32:744–754.
- Leventhal T, Brooks-Gunn J. Moving to Opportunity: An experimental study of neighborhood effects on mental health. *American Journal of Public Health* 2003;93:1576–1582. [PubMed: 12948983]
- Lewinsohn PM, Rohde P, Seeley JR. Adolescent psychopathology: III. The clinical consequences of comorbidity. *J Am Acad Child Adolesc Psychiatry* 1995;34:510–519. [PubMed: 7751265]

- Marmorstein NR, Iacono WG. Major depression and conduct disorder in a twin sample: gender, functioning, and risk for future psychopathology. *Journal of the American Academy Child and Adolescent Psychiatry* 2003;42:225–233.
- Marmorstein NR, Iacono WG. Major depression and conduct disorder in youth: associations with parental psychopathology and parent-child conflict. *Journal of Child Psychology and Psychiatry* 2004;45:377–386. [PubMed: 14982250]
- McCauley E, Myers K, Mitchell J, Calderon R, Schloredt K, Treder R. Depression in young people: initial presentation and clinical course. *Journal of the American Academy of Child and Adolescent Psychiatry* 1993;32:714–722. [PubMed: 8340290]
- McDermut W, Mattia J, Zimmerman M. Comorbidity burden and its impact on psychosocial morbidity in depressed outpatients. *Journal of Affective Disorders* 2001;65:289–295. [PubMed: 11511409]
- McLaughlin KA, Hilt LM, Nolen-Hoeksema S. Racial/ethnic differences in internalizing and externalizing symptoms in adolescents. *Journal of Abnormal Child Psychology* 2007;35:801–816. [PubMed: 17508278]
- Procidano ME, Heller K. Measures of perceived social support from friends and from family: Three validation studies. *American Journal of Community Psychology* 1983;11:1–24. [PubMed: 6837532]
- Riley AW, Forrest CB, Starfield B, Green B, Kang M, Ensminger M. Reliability and validity of the adolescent health profile-types. *Medical Care* 1998;36:1237–1248. [PubMed: 9708595]
- Rohde P, Clarke GN, Lewinsohn PM, Seeley JR, Kaufman NK. Impact of comorbidity on a cognitive-behavioral group treatment for adolescent depression. *Journal of the American Academy of Child and Adolescent Psychiatry* 2001;40:795–802. [PubMed: 11437018]
- Sourander A, Jensen P, Davies M, Niemela S, Elonheimo H, Ristkari T, et al. Who is at greatest risk of adverse long-term outcomes? The Finnish From a Boy to a Man study. *Journal of the American Academy of Child and Adolescent Psychiatry* 2007;46:1148–1161. [PubMed: 17712238]
- Stone S. Correlates of Change in Student Reported Parent Involvement in Schooling: A New Look at the National Education Longitudinal Study of 1988. *American Journal of Orthopsychiatry* 2006;76:518–530. [PubMed: 17209720]
- Thompson EA, Eggert LL. Using the suicide risk screen to identify suicidal adolescents among potential high school dropouts. *Journal of the American Academy of Child and Adolescent Psychiatry* 1999;38(12):1506–1514. [PubMed: 10596250]
- Tracy, M.; Zimmerman, FJ.; Galea, S.; McCauley, E.; Vander Stoep, A. What explains the relation between family poverty and childhood depressive symptoms?. *Journal of Psychiatric Research*. in press Available online at www.sciencedirect.com
- Vander Stoep A, McCauley E, Thompson KA, Herting JR, Kuo ES, Stewart DG, et al. Universal emotional health screening at the middle school transition. *J Emotional and Behavioral Disorders* 2005;13:213–223.
- Weiss B, Susser K, Catron T. Common and specific features of childhood psychopathology. *Journal of Abnormal Psychology* 1998;107:118–127. [PubMed: 9505044]
- Wentzel KR. Relations between social competence and academic achievement in early adolescence. *Child Development* 1991;62:1066–1078. [PubMed: 1756656]
- Wentzel KR. Does being good make the grade? Social behavior and academic competence in middle school. *Journal of Educational Psychology* 1993;85:357–364.
- Young JF, Berenson K, Cohen P, Garcia J. The Role of Parent and Peer Support in Predicting Adolescent Depression: A Longitudinal Community Study. *Journal of Research on Adolescence* 2005;15:407–423.
- Zoccolillo M. Co-occurrence of conduct disorder and its adult outcomes with depressive and anxiety disorders: a review. *Journal of the American Academy of Child and Adolescent Psychiatry* 1992;31:547–556. [PubMed: 1592790]

Table 1
Means (Standard Deviations) of Mediator and Outcome Variables by Psychopathology Risk Group and Sex

	Girls (n=247)	Boys (n=274)	Overall (n=521)
<u>Teacher-Reported Social Competence (Z-scores)[†]</u>			
NEITHER	0.10 (0.26)	0.13 (0.24)	0.11 (0.25)
CONDUCT ONLY	0.23 (0.39)	0.17 (0.26)	0.19 (0.31)
DEPRESSED ONLY	0.09 (0.17)	0.14 (0.25)	0.11 (0.21)
COMORBID	0.16 (0.22)	0.34 (0.38)	0.26 (0.33)
<u>Parent-Reported Social Competence (Z-scores)[†]</u>			
NEITHER	0.17 (0.27)	0.21 (0.30)	0.19 (0.29)
CONDUCT ONLY	0.35 (0.46)	0.24 (0.37)	0.27 (0.40)
DEPRESSED ONLY	0.32 (0.37)	0.30 (0.39)	0.31 (0.43)
COMORBID	0.36 (0.37)	0.42 (0.39)	0.39 (0.38)
<u>Social Support by Friends / Peers (Z-scores)</u>			
NEITHER	0.46 (0.56)	0.08 (0.83)	0.27 (0.73)
CONDUCT ONLY	0.32 (0.57)	-0.14 (0.70)	0.01 (0.69)
DEPRESSED ONLY	0.00 (0.59)	-0.39 (0.80)	-0.18 (0.72)
COMORBID	-0.13 (0.86)	-0.51 (0.87)	-0.33 (0.89)
<u>Social Support by Parents / Teachers (Z-scores)</u>			
NEITHER	0.33 (0.65)	0.19 (0.75)	0.26 (0.70)
CONDUCT ONLY	-0.08 (0.72)	0.06 (0.61)	0.01 (0.65)
DEPRESSED ONLY	-0.10 (0.61)	-0.04 (0.72)	-0.07 (0.66)
COMORBID	-0.43 (0.97)	-0.42 (0.71)	-0.42 (0.84)
<u>6th Grade Cumulative Grades (GPA)</u>			
NEITHER	3.50 (0.35)	3.12 (0.37)	3.31 (0.41)
CONDUCT ONLY	3.07 (0.41)	2.81 (0.40)	2.89 (0.42)
DEPRESSED ONLY	3.06 (0.35)	2.79 (0.38)	2.93 (0.38)
COMORBID	2.86 (0.35)	2.49 (0.37)	2.67 (0.40)
<u>7th Grade Global Functioning[‡]</u>			
NEITHER	5.89 (0.52)	7.29 (0.55)	6.60 (0.88)
CONDUCT ONLY	6.40 (0.62)	7.97 (0.62)	7.45 (0.97)
DEPRESSED ONLY	7.49 (0.54)	9.08 (0.62)	8.22 (0.97)
COMORBID	8.35 (0.53)	9.78 (0.55)	9.10 (0.90)

[†] Lower scores indicate higher social competence and global functioning.

Table 2
Results of Linear Regression Analyses Assessing the Associations between Psychopathology Risk Groups and Functional Outcomes: Step 1 of the Mediation Model

Psychopathology Risk Group	Unstandardized β (SE)	Standardized β (SE)	t
6 th Grade Cumulative Grade Point Average (n= 521; df= 8, 512)			
NEITHER (reference group)	--	--	NA
CONDUCT ONLY	-0.28 (.12)	-0.089	-2.34*
DEPRESSED ONLY	-0.24 (.10)	-0.091	-2.45*
COMORBID	-0.45 (.09)	-0.200	-5.24***
7 th Grade Global Functioning (n= 521; df= 9, 511)			
NEITHER (reference group)	--	--	NA
CONDUCT ONLY	2.18 (.84)	0.104	2.58*
DEPRESSED ONLY	0.56 (.71)	0.031	0.78
COMORBID	2.20 (.63)	0.143	3.48**

Note. Covariates in the analyses were age, sex, family income, and race. For the regression model using 7th grade global functioning as the independent variable, a dichotomized version score indicating low 6th grade global functioning (CIS > 15) was also used as a covariate.

*
 $p < .05$.

**
 $p < .01$.

 $p < .001$.

Table 3
Results of Linear Regression Analyses Assessing the Associations between Psychopathology Risk Groups and Potential Mediators: Step 2 of the Mediation Model

Potential Mediator	Unstandardized β	Standardized β	t
Psychopathology Risk Group			
<u>Social Competence</u>			
<u>Teacher-Reported Social Competence[†]</u>			
NEITHER (reference group)	--	--	NA
CONDUCT ONLY	0.06 (.04)	0.07	1.50
DEPRESSED ONLY	0.01 (.04)	0.02	0.36
COMORBID	0.14 (.03)	0.20	4.47***
<u>Parent-Reported Social Competence[†]</u>			
NEITHER (reference group)	--	--	NA
CONDUCT ONLY	0.06 (.05)	0.05	1.05
DEPRESSED ONLY	0.13 (.05)	0.13	2.83**
COMORBID	0.17 (.04)	0.20	4.35***
<u>Social Support</u>			
<u>Friend / Peer Support</u>			
NEITHER (reference group)	--	--	NA
CONDUCT ONLY	-0.13 (.12)	-0.04	-1.05
DEPRESSED ONLY	-0.44 (.10)	-0.17	-4.21***
COMORBID	-0.57 (.09)	-0.27	-6.33***
<u>Family / Teacher Support</u>			
NEITHER (reference group)	--	--	NA
CONDUCT ONLY	-0.24 (0.12)	-0.09	-2.06*
DEPRESSED ONLY	-0.23 (0.10)	-0.10	-2.29*
COMORBID	-0.57 (0.09)	-0.29	-6.70***

Note. For each set of analyses $n = 521$; $df = 8, 512$. Covariates in the analyses were age, sex, family income, and race. For the regression model using 7th grade global functioning as the independent variable, dichotomized score indicating low 6th grade global functioning ($CIS > 15$) was also used as a covariate.

[†] Lower scores indicate higher social competence.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 4
 Results of Linear Regression Analyses Assessing the Mediation Effects of Social Competence and Social Support on the Association between Psychopathology Risk Groups and Grades (GPA): Steps 3 and 4 of the Mediation Model

Potential Mediator Psychopathology Risk Group for which prior steps of the mediation model were satisfied	Unstandardized β (SE) for risk group WITHOUT potential mediator in model	Standardized β for risk group WITHOUT potential mediator in model	Unstandardized β (SE) for risk group WITH potential mediator in the model	Standardized β for risk group WITH potential mediator in model	Sobel t
<u>Teacher-Reported Social Competence</u> [†] (n=521; df=9, 511)					
COMORBID	-0.45 (0.09)	-0.20	-0.38 (0.09)	-0.17	-3.22**
<u>Parent-Reported Social Competence</u> [†] (n = 503; df= 9, 511)					
DEPRESSED ONLY	-0.24 (0.10)	-0.09	-0.19 (0.10)	-0.07	-2.21*
COMORBID	-0.45 (0.09)	-0.20	-0.39 (0.09)	-0.17	-2.99**
<u>Friend / Peer Social Support</u> (n= 521; df=9, 511)					
DEPRESSED ONLY	-0.24 (0.10)	-0.09	-0.18 (0.10)	-0.07	-2.75**
COMORBID	-0.45 (0.09)	-0.20	-0.37 (0.09)	-0.16	-3.08**
<u>Family / Teacher Social Support</u> (n= 521; df=9, 511)					
CONDUCT ONLY	-0.28 (0.12)	-0.09	-0.22 (0.12)	-0.07	-1.87
DEPRESSED ONLY	-0.24 (0.10)	-0.09	-0.19 (0.10)	-0.07	-2.11*
COMORBID	-0.45 (0.09)	-0.20	-0.32 (0.09)	-0.14	4.05***

Note. Covariates in the analyses were age, sex, family income, and race.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

[†] Lower scores indicate higher social competence.

Table 5
 Results of Linear Regression Analyses Assessing the Mediation Effects of Social Competence and Social Support on the Associations between Psychopathology Risk Groups and Parent-Reported Global Functioning: Steps 3 and 4 of the Mediation Model

Potential Mediator Psychopathology Risk Group for which prior steps of the mediation model were satisfied	Unstandardized β (SE) for risk group WITHOUT potential mediator in model	Standardized β for risk group WITHOUT potential mediator in model	Unstandardized β (SE) for risk group WITH potential mediator in the model	Standardized β for risk group WITH potential mediator in model	Sobel t
<u>Social Problems</u>					
<u>Teacher-Reported Social Problems</u>					
COMORBID	2.20 (0.63)	0.14	1.89 (0.64)	0.12	2.44*
<u>Parent-reported Social Problems</u>					
COMORBID	2.20 (0.63)	0.14	1.66 (0.62)	0.11	3.52***
<u>Social Support</u>					
<u>Friend / Peer Social Support</u>					
COMORBID	2.20 (0.63)	0.14	2.04 (0.65)	0.13	0.97
<u>Family / Teacher Social Support</u>					
CONDUCT ONLY	2.18 (0.84)	0.10	2.15 (0.85)	0.10	0.32
COMORBID	2.20 (0.63)	0.14	2.14 (0.66)	0.14	0.33

Note. For all analyses, n = 521; df = 10, 510. Covariates in the analyses were age, sex, family income, race, and a dichotomized score indicating low 6th grade global functioning (CIS > 15).

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