

Further Evaluation of Associations Between Attention-Deficit/Hyperactivity and Oppositional Defiant Disorder Symptoms and Bullying-Victimization in Adolescence

Paula J. Fite · Spencer C. Evans ·
John L. Cooley · Sonia L. Rubens

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Abstract Relations between symptoms of attention-deficit/hyperactivity disorder (ADHD) and oppositional defiant disorder (ODD) and bullying-victimization in adolescence are not yet clear. Accordingly, the current study evaluated these associations, with attention to gender differences, in a sample of predominantly Latino 9th–12th grade students (52.6 % male; mean grade level = 10.35, SD = 1.11). Further, the role of peer delinquency in these associations was evaluated. Findings indicated that ODD symptoms were more strongly associated with both bullying and victimization than ADHD symptoms, and the effects of ODD symptoms on physical forms of both bullying and victimization were stronger for males than females. The association between ODD symptoms and physical bullying was stronger at high levels of peer delinquency when compared to low levels of peer delinquency for both males and females. The role of peer delinquency in the link between ADHD symptoms and bullying and victimization appears to be gender specific and in need of further evaluation. Implications for the need to focus primarily on ODD symptoms for both bullying and victimization prevention and intervention are discussed.

Keywords Inattention and hyperactivity · Oppositional behavior · Bullying · Victimization

Introduction

There is evidence to suggest that symptoms of both attention-deficit/hyperactivity disorder (ADHD) and oppositional defiant disorder (ODD) are associated with social impairments, including engaging in bullying behavior and experiencing peer victimization [1–6]. However, unique associations of these highly comorbid symptom clusters have not been well-studied, particularly in adolescence when peer relationships become increasingly important [7–9]. Gender differences in these associations are also not yet clear [7]. A better understanding of potential gender differences is needed to identify potential differences in targets of intervention. Further, potential moderators of the link between symptoms of ODD and ADHD and bullying and victimization have not been evaluated. For instance, peer delinquency (affiliating with peers who engage in behavior that can result in getting into trouble) has been found to contribute to associations between individual characteristics and subsequent negative outcomes [10] but the role of peer delinquency in the link between symptom clusters and bullying and victimization is not yet known. Accordingly, the current study sought to examine whether gender and peer delinquency moderated associations between ODD and ADHD symptoms and both physical and relational bullying and victimization in a sample of adolescents.

Associations Between Symptom Clusters and Bullying and Victimization

Before discussing how diagnostic symptomatology are related to bullying and victimization, it is important to define different forms of bullying-involved behavior among youth. Bullying in general can be defined as one or

P. J. Fite (✉) · S. C. Evans · J. L. Cooley · S. L. Rubens
Clinical Child Psychology Program, University of Kansas,
Lawrence, KS 66045, USA
e-mail: pfite@ku.edu

more youths performing aggressive behaviors toward another peer, with the intent to cause harm [11]. In turn, victimization is being the object of peer aggression. Bullying and victimization can take various forms, including physical (e.g., hitting, pushing) and relational (e.g., spreading rumors about a peer behind their back) [12].

Children and adolescents who exhibit symptoms of ADHD are significantly more likely to experience both physical and relational victimization than their typically developing peers [1, 4–6, 13, 14]. At the same time, these studies also suggest that youths with ADHD are more likely to engage in bullying themselves; however, this association is generally smaller and less consistent than the link between ADHD and victimization [1, 4–6, 13, 14]. Gender differences may be one factor contributing to this inconsistency, but the extant research has yielded mixed results. Unnever and Cornell [14] found that gender did not directly predict bullying or victimization, but rather was overshadowed by other variables including physical attributes, ADHD, and self-control. However, more recent research suggests that ADHD symptoms may be more strongly associated with peer victimization in girls and with bullying in boys [6, 7, 15]. Sciberras and colleagues [7] suggest that this difference may be accounted for by normative social expectations. That is, higher levels of hyperactivity, impulsivity, and inattention may be more socially tolerable in boys than in girls, a notion which has some empirical support [16].

There is also some evidence suggesting a link between symptoms of ODD and both bullying and victimization [2, 3]. For example, Kokkinos and Panayiotou [2] found that ODD is positively correlated with both bullying and victimization. Both ADHD and ODD were also among the most common psychiatric diagnoses among children identified by their peers as bullies and/or victims [3]. Wiener and Mak [6] found that, in a predominately male sample of children and adolescents diagnosed with ADHD, oppositional behavior mediated the relationship between ADHD symptoms and bullying behavior. Similarly, Sciberras and colleagues [7] found that, among a sample of adolescent girls, when ODD symptoms were included in the model, they significantly predicted both parent- and self-reported relational bullying, but the association with a diagnosis of ADHD was no longer statistically significant. However, due to a small sample size ($N = 42$) and discrepant results across multiple informants, their results were less clear with regard to the relations among ADHD, ODD, overt bullying, and both types of victimization.

The studies reviewed above offer preliminary evidence to suggest that, in both males and females, oppositional behaviors are more directly related to bullying than are ADHD symptoms, while both ADHD and ODD symptoms may be associated with peer victimization. However, further

investigation of how these symptoms are related to various forms of bullying and victimization is needed. Only two of the studies cited above [6, 7] attended to differences in multiple dimensions of bullying behavior, such as relational and physical bullying. Wiener and Mak [6] found that children with ADHD were subjected to verbal, physical, and relational victimization more frequently than their peers, but did not examine those same dimensions with respect to bullying (overall, bullying was greater among children with ADHD). Sciberras and colleagues [7] examined both overt and relational bullying and victimization, but in a small all-female sample that did not allow for gender comparisons and yielded some mixed findings, as noted above. Thus, further research is needed to explore relations among bullying and victimization subtypes, diagnostic symptomatology, and gender, particularly in adolescence when peer relationships become increasingly important [8, 9].

Peer Delinquency as a Moderator

Bullying and victimization occur within the larger social context of the peer group [17, 18]. Although individual characteristics such as symptoms of ADHD and ODD may predispose youth to engage in bullying and experience peer victimization, it is important to consider the potential influence of peer delinquency on these relations, as peer delinquency is a significant predictor of both bullying and victimization [19] and peer delinquency has been found to impact relations between child behavior and subsequent outcomes [10, 20].

Previous research indicates that peer social clusters demonstrate within-group similarity on bullying behaviors [21, 22]. Bullies tend to affiliate and form social networks with other bullies. Moreover, Duffy and Nesdale [23] found that children were more likely to engage in bullying if such behavior was endorsed by group norms. Disruptive behavior at school in combination with high levels of best friend's deviancy is associated with elevated levels of subsequent delinquent behavior [10]. Thus, one may expect ODD symptoms in combination with peer delinquency to be associated with the highest levels of bullying behavior. In contrast, however, Vitulano and colleagues [20] found that children who exhibit low levels of impulsivity were particularly vulnerable to delinquent peer influences, with delinquent peer affiliations having less influence on impulsive individuals. They posited that youth high in impulsivity may already be on a developmental trajectory to engage in inappropriate behavior and therefore may not be as influenced by peer behavior as non-impulsive youth. Therefore, it may be that peer delinquency is more important in the association between ODD symptoms and bullying than in the association between ADHD symptoms and bullying.

Few studies to date have investigated the behavioral characteristics of youth's friends in relation to peer victimization; however, there is evidence that aspects of peer affiliation, including having friends and being liked by one's peers, are protective against victimization [24]. Specifically regarding delinquent peers, findings suggest that friendships with peers who exhibit behavioral problems tend to reduce risk for victimization. That is, when children's friends were characterized by externalizing behaviors, their own externalizing problems were less predictive of victimization by peers [25, 26]. Thus, it may be that peer delinquency buffers the link between ODD and ADHD symptoms and victimization.

Current Study

The current study examines the extent to which symptoms of ADHD and ODD are associated with bullying and victimization in adolescence. This study extends the literature by examining the role of gender differences and peer delinquency in these associations. Consistent with previous research [6, 7], the following relations were hypothesized. First, in both males and females, symptoms of ODD were expected to be more strongly associated with bullying outcomes than symptoms of ADHD, and both ODD and ADHD symptoms were expected to be associated with victimization. Peer delinquency was expected to be more important in the link between ODD symptoms and bullying than in the link between ADHD symptoms and bullying, with peer delinquency exacerbating the association between ODD symptoms and bullying for both males and females. Finally, peer delinquency was expected to buffer the link between both ADHD and ODD symptoms and victimization for both males and females.

Note that in order to evaluate the full spectrum of bullying behavior and victimization experiences, both physical and relational behaviors were assessed in the current study. Further, there are significant gender differences in aggressive behaviors, such that females demonstrate proportionally higher rates of relational than physical aggression, and males are more apt to engage in physical aggression than females [27–32]. Accordingly, in the present study physical and relational forms of bullying and victimization were analyzed separately.

Methods

Participants

Participants included 173 adolescents attending a charter high school in a large, Midwestern city, and their second-hour teacher. This particular high school was started to

target Latino youth at risk of dropping out of school, so the majority of their student body (approximately 95 %) are Latino. According to school records, 95.4 % of the students at this school qualify for free or reduced lunch fees, indicating that this sample is primarily of a low socioeconomic status level. Teachers anonymously completed measures for the 200 students enrolled at this school during the time of data collection. However, due to limited responses on the measures relevant to the current study, a subset of 173 participants were included in the analyses, as described below. The final sample of participants in the current analyses included 91 males and 82 females with the following grade breakdown: 47 (27 %) participants in 9th grade, 49 (28 %) participants in 10th grade, 39 (23 %) participants in 11th grade, and 38 (22 %) participants in 12th grade.

Procedures

This study was approved by the researchers' institutional review board. Teachers were asked to complete an online survey using Qualtrics interview software for each student in their second hour period. Each survey took approximately ten minutes to complete, and teachers had two weeks to complete the surveys for each student in their class. Teachers provided written informed consent prior to being given access to the survey and were compensated \$10 for each survey completed.

Measures

Bullying/Victimization

Bullying and victimization were evaluated using teacher reports on an 18-item measure with a 5-point likert scale (Never–Almost Always). This measure was adapted for this study from a peer-nomination scale [12], and teachers completed the measure for each student. Four subgroups with three items each were created from this measure: physical bullying (e.g., “hits, kicks, punches others”), relational bullying (e.g., “tries to make other kids not like a certain person by spreading rumors about them”), physical victimization (e.g., “gets hit, kicked, punched by others”), and relational victimization (e.g., “other kids tell rumors about them behind their back”). The remaining six items related to bystander behaviors and were not included in the current analysis. Averages for each subgroup were calculated, with higher scores indicating more bullying/victimization behaviors, with possible scores ranging from 1 to 5. In this sample, the four scales demonstrated good internal consistency ($\alpha = 0.78$ for physical bullying, $\alpha = 0.67$ for relational bullying, $\alpha = 0.87$ for physical victimization, $\alpha = 0.88$ for relational victimization).

ODD and ADHD Symptoms

Symptoms of ODD and ADHD were evaluated using the Disruptive Behavior Disorder checklist [33], a 26-item measure on a 4-point likert scale (Not at All–Very Much). Consistent with previous research, items were recoded to indicate the presence or absence of a symptom, with those items rated as “pretty much” or “very much” considered as an endorsement of each symptom [34]. Two subscales were calculated, including an 8-item subscale of ODD symptoms and an 18-item subscale of ADHD symptoms. Items endorsed for each subscale were summed together, with ODD symptom scores ranging from 0 to 8 and ADHD symptoms scores ranging from 0 to 18. In this sample, good internal consistency was demonstrated for both the ODD subscale ($\alpha = 0.92$) and the ADHD subscale ($\alpha = 0.94$).

Peer Delinquency

Peer delinquency was evaluated using one item regarding affiliating with others who get into trouble from the rule-breaking scale of the teacher report form (TFR) [35]. This item was rated on a 3-point likert scale (0 = Not True, 1 = Somewhat or Sometimes True, 2 = Very or Often True). Scores could range from 1 to 3, with higher scores indicating that participants are more likely to associate with delinquent peers.

Data Analysis Plan

Correlations (i.e., Pearson coefficients for associations between continuous variables and point biserial coefficients for associations between dichotomous and continuous variables) using SPSS statistical software were first estimated to evaluate bivariate associations. Path models using Mplus were then estimated to evaluate unique associations. Maximum likelihood robust (MLR) estimation was used for the path models due to the skewness of physical bullying and victimization outcome variables exceeding the recommended value of 3 (4.08 and 4.99 respectively) [36]. MLR utilizes a mean- and variance-adjustment Chi square test statistic that is robust to non-normally distributed data [37]. Note that all models were fully saturated (i.e., no degrees of freedom), providing a perfect fit to the data. Therefore, model fit statistics are not reported. Independent variables were mean centered prior to estimating path models in order to aid in the interpretation of interaction effects. Statistically significant interactions were probed at high (“Very or Often True”) and low (“Not True”) values of peer delinquency and/or when

the model was conditioned to represent associations for males or females using standard procedures [38]. Significant interactions were then plotted at high and low levels (± 1 SD) of ODD and ADHD symptoms, reflecting high and low values of symptoms in the current sample.

Note that when examining diagnostics of study variables, a pattern of differences in responding for physical and relational bullying and victimization items was found. Specifically, teachers did not respond to any relational bullying or victimization items for 44 students. Because these data were not missing at random (i.e., teachers made the decision that they were not accurate informants of these behaviors), listwise deletion was used to accommodate missing data. In order to use the maximum amount of data available, both physical outcomes were simultaneously examined in one set of models and the relational outcomes were simultaneously examined in a second set of models. The models for the physical outcomes included data for 173 individuals (87 % of entire sample), while models for the relational outcomes only included data for 139 individuals (70 % of entire sample).

Results

Descriptive Statistics

Correlations, means, and standard deviations are reported in Table 1. As expected, symptoms of ADHD and ODD were strongly positively associated, suggesting that these symptom clusters shared approximately 27 % of their variance. Additionally, the bullying and victimization variables were all positively associated. High levels of ADHD were associated with high levels of physical bullying. Further, high levels of ADHD symptoms were related to high levels of physical and relational victimization. ODD symptoms were positively associated with both physical and relational bullying as well as physical and relational victimization. Similarly, peer delinquency was positively associated with all four bully and victimization outcomes. Males exhibited higher levels of both ODD and ADHD symptoms, delinquent peer affiliations, physical bullying and physical victimization than females. Females exhibited higher levels of relational bullying than males. However, no gender differences in relational victimization were found. Finally, no effects of grade were evident.

Path Models

As stated above, due to missing data two series of path models were estimated, one for physical outcomes and one for relational outcomes.

Table 1 Correlations and descriptive statistics of study variables

	1	2	3	4	5	6	7	8	9
1. Gender	–								
2. Grade	0.02	–							
3. ODD	–0.16*	–0.03	–						
4. ADHD	–0.25**	–0.12	0.52**	–					
5. Peer delinq.	–0.15*	–0.08	0.32**	0.37**	–				
6. Physical bully.	–0.16*	0.04	0.64**	0.30**	0.25**	–			
7. Relational bully.	0.19*	0.06	0.39**	0.05	0.22**	0.39**	–		
8. Physical victim.	–0.18**	–0.05	0.54**	0.27**	0.23**	0.72**	0.37**	–	
9. Relational victim.	0.02	–0.04	0.47**	0.33**	0.20*	0.46**	0.43**	0.54**	–
Mean	–	10.35	0.70	2.71	1.56	1.10	1.38	1.06	1.19
SD	–	1.11	1.59	3.85	0.63	0.31	0.64	0.27	0.48
Range	–	9–12	0–8	0–18	1–3	1–3.33	1–4	1–3	1–3

Delinq. delinquency, *Bully.* bullying, *Victim.* victimization

* $p < .05$

** $p < .01$

Physical Outcomes

When both physical bullying and victimization were regressed on gender, grade, ODD symptoms, and ADHD symptoms findings suggested that ODD symptoms were uniquely positively associated with both physical bullying and victimization (See Table 2). ADHD symptoms were not uniquely related to either physical outcome. The moderating effect of peer delinquency was then evaluated by adding the first order effect of peer delinquency along with the cross product terms of the symptom clusters and peer delinquency (ODD symptoms \times peer delinquency; ADHD symptoms \times peer delinquency) to the model. Peer delinquency moderated the association between ODD symptoms and physical bullying ($B = 0.06$, $p = .01$). Although ODD symptoms were positively associated with physical bullying at both high ($B = 0.21$, $p = .0001$) and low ($B = 0.09$, $p = .02$) levels of peer delinquency, the magnitude of the association was stronger when levels of

peer delinquency were high. No other moderating effects of peer delinquency were found ($Bs = 0.01$ – 0.02 , $ps > .20$).

Gender differences were evaluated by adding cross product terms between the symptom clusters and gender (ODD symptoms \times gender; ADHD symptoms \times gender) to the model. Gender differences in associations between ODD symptoms and both physical outcomes were evident ($Bs = -0.15$ and -0.13 , $ps < .0002$). ODD symptoms were positively associated with physical bullying for both boys ($B = 0.21$, $p = .0001$) and girls ($B = 0.06$, $p = .02$); however this association was stronger for boys than girls. ODD symptoms were positively associated with physical victimization for boys ($B = 0.16$, $p = .0001$) but not for girls ($B = 0.03$, $p = .30$). No gender differences in associations between ADHD symptoms and physical outcomes were evident ($Bs = 0.006$ and 0.007 , $ps > .60$).

Finally, gender differences in the moderating effects of peer delinquency on associations between symptom clusters and physical outcomes were examined by adding

Table 2 Path models evaluating unique associations between symptom clusters and bullying and victimization

	Physical				Relational			
	Bullying		Victimization		Bullying		Victimization	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Gender	–0.04	0.03	–0.06	0.04	0.34*	0.10	0.12	0.08
Grade	0.02	0.02	–0.01	0.01	0.00	0.04	0.01	0.03
ODD Sx.	0.15*	0.03	0.11*	0.03	0.16*	0.04	0.12*	0.04
ADHD Sx.	0.00	0.01	0.00	0.01	–0.01	0.01	0.02	0.01

Sx. symptoms

* $p < .05$

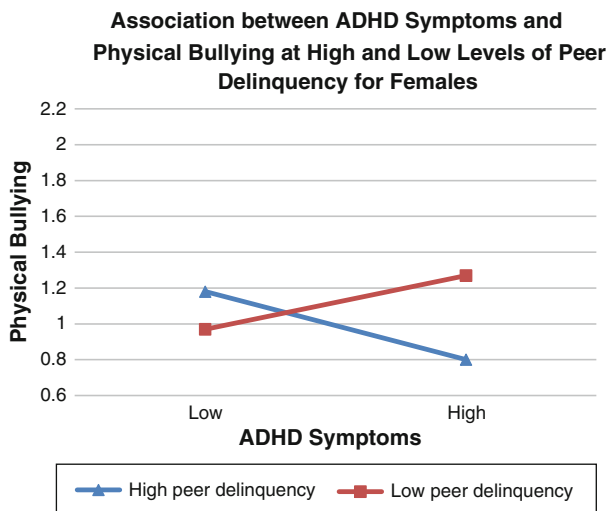


Fig. 1 Association between ADHD symptoms and physical bullying at high and low levels of peer delinquency for females

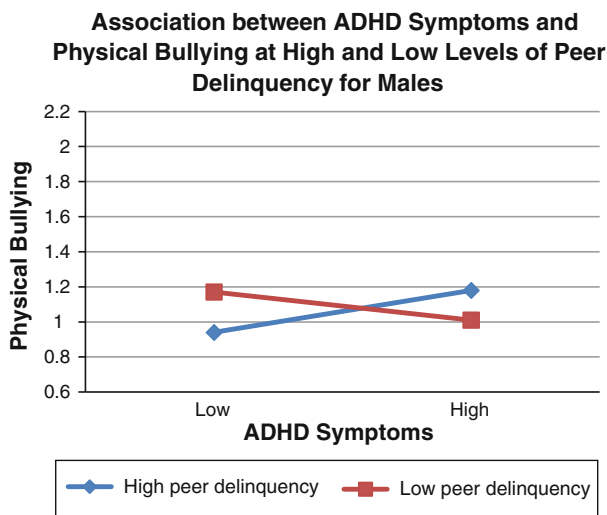


Fig. 2 Association between ADHD symptoms and physical bullying at high and low levels of peer delinquency for males

3-way interactions to the model, and a significant gender \times peer delinquency \times ADHD symptoms interaction effect was found ($B = -0.07$, $p = .01$) for physical bullying. When examining relations among females, ADHD symptoms were negatively associated with physical bullying at high levels of peer delinquency ($B = -0.05$, $p = .05$) and unrelated to physical bullying at low levels of peer delinquency ($B = 0.04$, $p = .12$). As seen in Fig. 1, when levels of peer delinquency are high, high levels of ADHD symptoms are associated with low levels of physical bullying. However, in the absence of peer delinquency, high levels of ADHD symptoms are associated with high levels of physical bullying. In contrast, for males, at low levels of peer delinquency, ADHD symptoms were negatively

associated with physical bullying ($B = -0.02$, $p = .01$). At high levels of peer delinquency, ADHD symptoms were marginally positively related to physical bullying ($B = 0.03$, $p = .06$). As seen in Fig. 2, it appears that physical bullying is at its highest when either both ADHD symptoms and delinquent peer affiliations are low or when both ADHD symptoms and delinquent peer affiliations are high. No other significant 3-way interactions were evident ($ps > .22$).

Relational Outcomes

When both relational bullying and victimization were regressed on gender, grade, ODD symptoms, and ADHD symptoms findings suggested that ODD symptoms were positively associated with both relational bullying and victimization (See Table 2). However, ADHD symptoms were not uniquely related to either outcome. Peer delinquency was then examined as a moderator of these associations using the same procedure described above. However, no significant moderating effects were found ($Bs = -0.03$ to 0.01 , $ps > .52$). Gender differences in the associations between ODD and ADHD symptoms and the relational outcomes were also examined. However, no significant gender differences emerged ($Bs = -0.11$ to 0.03 , $ps > .24$).

Finally, gender differences in the moderating effects of peer delinquency were examined by including 3-way interactions (symptom cluster \times peer delinquency \times gender) in the model. Two significant 3-way interactions emerged, suggesting gender differences in the moderating effects of peer delinquency on the associations between ADHD symptoms and both relational bullying ($B = -0.15$, $p = .03$) and relational victimization ($B = -0.14$, $p = .03$). For females, ADHD symptoms were positively associated with relational bullying at low levels of peer delinquency ($B = 0.11$, $p = .05$), and negatively associated at high levels of peer delinquency ($B = -0.19$, $p = .04$). As seen in Fig. 3, the lowest levels of relational bullying were evident when levels of peer delinquency were high and levels of ADHD symptoms were high. The highest levels of relational bullying occurred at high levels of peer delinquency in conjunction with low levels of ADHD and at low levels of peer delinquency in tandem with high levels of ADHD symptoms. ADHD symptoms were not associated with relational victimization at low ($B = 0.10$, $p = .10$) or high ($B = -0.11$, $p = .18$) levels of peer delinquency for females. In contrast, ADHD symptoms were not associated with relational bullying at low ($B = -0.03$, $p = .11$) or high ($B = -0.02$, $p = .61$) levels of peer delinquency among males. However, ADHD symptoms were positively associated with relational victimization when levels of peer delinquency were high

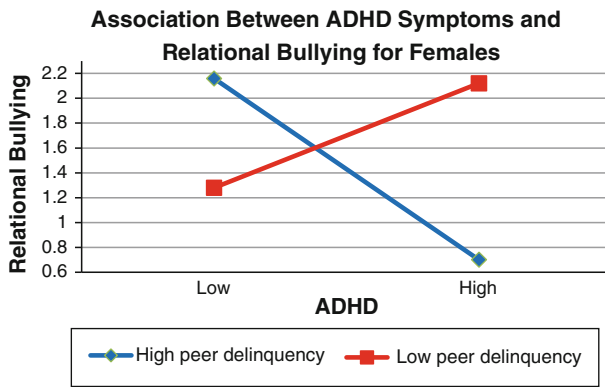


Fig. 3 Association between ADHD and relational bullying at high and low levels of peer delinquency for females

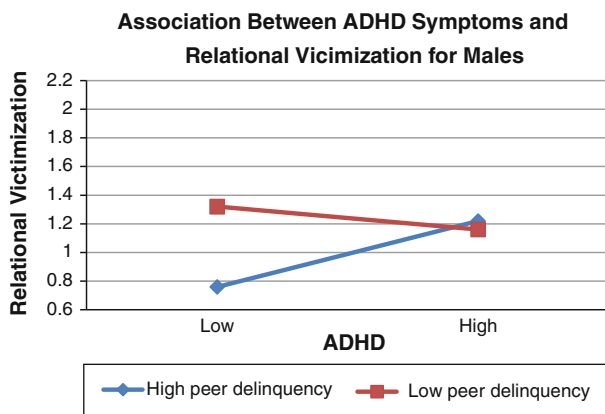


Fig. 4 Association between ADHD and relational victimization at high and low levels of peer delinquency for males

($B = 0.06, p = .01$) but not low ($B = -0.02, p = .41$) for males. The lowest levels of relational victimization appear to occur when ADHD symptoms are low and delinquent peer affiliations are high (See Fig. 4). Peer delinquency does not appear to matter, however, when ADHD symptoms are evident, as high levels of ADHD symptoms were associated with mean levels of relational victimization at both high and low levels of peer delinquency.

Discussion

The current study further evaluated associations between ADHD and ODD symptom clusters and bullying and victimization in a sample of adolescents. Consistent with previous research [7], overall we found that ODD symptoms are more strongly associated with both physical and relational forms of bullying and victimization than ADHD symptoms for both male and female adolescents. Findings advance previous research by demonstrating gender specific effects and by providing evidence that peer

delinquency is an important factor to consider in the associations between symptom clusters and bullying and victimization. Further, results suggest that teachers are not as aware of relational bullying and victimization as they are of physical forms of these behaviors. Specific findings and their implications are reviewed below.

Bullying

Consistent with expectations, symptoms of ODD were more strongly associated with both physical and relational bullying than symptoms of ADHD. Although the link between ODD symptoms and physical bullying was evident for both genders, ODD symptoms were more strongly associated with physical bullying for males than females. Findings are consistent with previous research demonstrating a link between ODD symptoms and bullying for both males and females [2, 3, 6, 7], and it may be that the association between ODD symptoms and physical bullying is stronger for boys because boys tend to engage in more physical aggression than girls [28, 32].

Extending the literature, findings suggest that peer delinquency moderates the link between ODD symptoms and physical bullying, such that this association is strongest when delinquent peer affiliations are present. These effects appear to be similar across males and females. Findings are consistent with previous research, suggesting that delinquent peer affiliations exacerbate the effects of disruptive behavior on subsequent problem behavior [10]. Peer delinquency did not moderate the link between ODD symptoms and relational bullying. Peer delinquency may play more of a role in the link between ODD symptoms and physical bullying, as delinquent peer behavior tends to be physical in nature.

The impact of peer delinquency on the associations between ADHD symptoms and both physical and relational bullying appears to vary as a function of gender. For males, ADHD symptoms were negatively associated with physical bullying at low levels of peer delinquency, but marginally positively associated with physical bullying at high levels of peer delinquency. The effect appears to be driven by the lowest levels of physical bullying found for males who exhibited few symptoms of ADHD and high levels of affiliation with delinquent peers. Note, however, that although the slope for low levels of peer delinquency is statistically significant, effects do not vastly differ across levels of peer delinquency. It is not clear why low levels of ADHD symptoms in conjunction with high levels of peer delinquency would be associated with the lowest levels of physical bullying and why this effect would be specific to males. Future research is necessary before any conclusions should be drawn regarding this effect.

In contrast, females exhibited the lowest levels of both physical and relational bullying at high levels of ADHD

symptoms in conjunction with high levels of peer delinquency. Consistent with expectations that delinquent peer affiliations would be more important for ODD symptoms, it may be that once controlling for the effects of ODD symptoms delinquent peer affiliations do not increase the levels of bullying behavior among females exhibiting ADHD symptoms. Specific to relational bullying, high levels of ADHD symptoms in conjunction with low levels of peer delinquency result in the same level of relational bullying as low levels of ADHD symptoms in tandem with high levels of peer delinquency. It may be that because impulsive and inattentive females tend to be socially excluded [7], females who exhibit ADHD symptoms and do not have delinquent peers to model their behavior after may be attempting to use relational bullying (in lieu of physical bullying and other means) to gain social status and acceptance. That is, in the absence of peers engaging in delinquent acts, impulsive and inattentive females may be engaging in more gender common relationally aggressive behavior [29, 30, 32]. When examining relations with physical bullying, it appears that high levels of ADHD symptoms in conjunction with low levels of peer delinquency are only producing mean levels of physical bullying, further supporting the notion that females exhibiting ADHD symptoms appear to be more apt to engage in relational bullying behavior than physical bullying behavior.

Victimization

ODD symptoms appear to be associated with relational victimization for both males and females, but only physical victimization for males. Physical aggression is more common among males than females [28], and ODD symptoms may result in physical victimization more often among adolescent males. Contrary to expectations, peer delinquency does not appear to buffer the associations between ODD symptoms and victimization for either gender. Rather, ODD symptoms appear to result in victimization regardless of the level of delinquent peer affiliations.

Contrary to expectations, ADHD symptoms were not related to physical victimization in any scenario, and the only association between ADHD and relational victimization was found for males when examining peer delinquency as a moderator. There were no differences at high levels of ADHD symptoms, with mean levels of relational victimization evident at both high and low levels of peer delinquency. Peer delinquency findings are consistent with expectations and prior research suggesting that peer delinquency is not as influential in the presence of impulsivity [20]. Also consistent with expectations and previous research [25, 26], at low levels of ADHD, having delinquent peers appears to reduce adolescent's risk of relational victimization. The fear of retaliation from delinquent peers

may prevent adolescent males who do not exhibit elevated symptoms of ADHD from being victimized by others.

Together, findings suggest ODD symptoms, but not ADHD symptoms, should be targeted for the prevention of bullying and victimization for both males and females. Further, peer delinquency may be a particularly important target of intervention for bullying, specifically physical bullying. In order to mitigate the effects of ODD symptoms, and reduce the likelihood of delinquent peer affiliation, interventions for bullying prevention should target youth who exhibit ODD symptoms and include social skills training and encourage parental monitoring of adolescents. Behavioral parent training programs, which include parental monitoring as a strategy, have been found to be effective in reducing aggression and oppositional symptoms [39]. Additionally, there is growing evidence to suggest that social skills training is helpful in reducing problem behavior [40, 41]. Thus, these interventions may be strategies to consider for the prevention of bullying.

Although adult monitoring may still be indicated for reducing ODD symptoms and preventing victimization, peer delinquency does not appear to be indicated as a target of prevention and intervention for victimized youth. Rather interventions that focus on hostility and negative social interactions may be indicated. ODD symptoms are associated with irritability and temper [42], which may put these youth at risk for being victimized because of their reaction to the bullying behavior. Interventions that help youth exhibiting ODD symptoms and experiencing victimization cope with and regulate the negative emotions that they experience may be indicated. Several cognitive behavioral programs have been found to be effective in reducing negative emotions among youth [43]; however, their impact on the negative emotions associated with being victimization, and for those who also exhibit ODD symptoms, are unclear. Future research examining the effectiveness of these programs with these particular types of youth are warranted.

Teacher Reports of Relational Outcomes

One important aspect of the current study is that a large proportion (21 %) of participants' teachers did not respond to items related to relational bullying or victimization. Several reasons may account for this pattern of responding. Although teachers have been found to be valid reporters of bullying [44], high school students often change teachers for each class throughout the school day, therefore teachers are limited in the time and setting in which they may interact with their students [44]. This may result in less knowledge of individual students than one would find in an elementary school setting. Further, relational victimization often involves more covert forms of bullying compared to

physical bullying [12, 31]. As a result, teachers may not recognize this behavior as readily as physical victimization, particularly as their students change classrooms throughout the school day. However, we note that teacher reports of bullying behaviors were consistent with previous research regarding gender differences in aggressive/bullying behavior [27–32]. Educating teachers on the signs of relational bullying and victimization may be warranted in order to reduce the instances of these harmful behaviors in schools.

Limitations and Future Directions

Several limitations should be considered in the interpretation of these findings. First, teachers had some difficulties reporting on relational forms of both bullying and victimization. It may be that teachers are underreporting levels of bullying and victimization, given their limited knowledge of behavior, particularly relational acts of behavior. Therefore, more research examining informant differences in ratings of relational behavior is needed before firm conclusions can be drawn. Further, the constructs of interest were all assessed via teacher report, which may result in mono-informant bias. It would be useful for future research to use multiple informants of behavior. Also, the sample was comprised of predominantly low-income Latino youth attending an urban charter school, which may limit the generalizability of results. Additionally, the use of a single item to assess peer delinquency is not ideal. Although the item on peer delinquency was from a validated measure of rule breaking behavior [35], the use of one item may influence the depth of understanding gained from these findings. Future research may consider examining this construct in greater depth using reports from both the adolescent and direct reports from their peers in order to better understand the role of peer delinquency in the relation between ADHD/ODD symptoms and bullying and victimization. While the present study examined diagnostic symptoms within a school sample, future research should also examine these associations among clinical samples of youth. Finally, future research may wish to examine these constructs in a longitudinal study in order to better understand the relation between symptoms of ADHD/ODD and bullying/victimization behaviors. Nevertheless, this cross-sectional study provides insight into the relation of these constructs and can help inform prevention and intervention efforts for youth with these clinical symptoms.

Summary

In sum, the current study advanced the field by further evaluating associations between ODD and ADHD symptoms and

bullying and victimization. Findings suggest that ODD symptoms rather than ADHD symptoms are associated with both bullying and victimization among adolescents. Thus, ODD symptoms need to be targeted for the prevention of both bullying and victimization, and peer delinquency may be an important target of intervention specifically for physical bullying. While ODD symptoms are associated with both physical and relational bullying for both genders, the association between ODD symptoms and physical bullying is stronger for males than females. Further, although ODD symptoms are associated with relational victimization for both males and females, the link between ODD symptoms and physical victimization is only evident for males. Peer delinquency strengthens the association between ODD symptoms and physical bullying for both males and females, but does not moderate any other effects of ODD symptoms. Note that the only statistically significant 3-way interactions found involved ADHD symptoms, suggesting that gender differences in the impact of delinquent peers are more evident among ADHD symptom outcomes than ODD symptom outcomes. Future research further examining gender differences in these associations, particularly with regard to the effects of ADHD symptoms, is warranted.

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