Examination of Comorbid Anxiety as a Moderator of the Relationship Between ADHD and Impaired Peer Relations

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Abstract

Attention deficit hyperactivity disorder (ADHD) is often associated with poor peer relations in affected children. Studies also indicate a link between anxiety, which has been found to be highly comorbid with ADHD, and peer difficulties. The current study examines the relationship between ADHD and peer relations, in addition to the potential moderating effects of comorbid anxiety. Children's ADHD and anxiety symptoms were rated based on a comprehensive assessment that includes psychosocial and clinical interviews, and broad-band and narrow-band standardized rating scales of emotional and behavioral functioning completed by parents, teachers, and parents. Anxiety was separated into four subcategories: total anxiety, physical anxiety, worry, social anxiety. The sample includes 171 children ages 7 to 13 years. Collectively, total anxiety and worry significantly moderated the relationship between teacher ratings of ADHD symptoms and peer problems. These findings suggest that comorbid internalizing anxiety disorders, and specifically worry, convey increased risk of poor peer relations in children with ADHD.

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Approximately 6.1 million children have a diagnosis of attention deficit hyperactivity disorder (ADHD) (CDC, 2021), which amounts to 9.4% of children. There are three presentations of the ADHD diagnosis described in the DSM-V, including the inattentive and hyperactive/impulsive presentations, as well as the combined presentation that includes both inattentive and hyperactivity/ impulsive symptoms (APA, 2013). Children with the inattentive presentation exhibit symptoms including poor listening skills (Chermack et al., 2002), diminished attention span (Hinshaw et al.,2007), failure to focus on details (Song & Hakoda, 2012), and increased off task behavior (Jewell, 1998). Notably, children with the inattentive presentation, compared to typically developing children (TD), are more likely to attribute their failures to internal factors and successes to external factors (Owens, 2002). To that end, children with the inattentive presentation are more likely to be self-derogatory in self-ratings when compared to TD children (Owens, 2002). Children with the hyperactive/ impulsive presentation presents with difficulties related to hyperactivity and restlessness (Shastray, 2004), inability to play quietly (Ghanizadeh, 2009), difficulty sitting still (Villodas, 2014), and talkativeness (Von Briesen, 2007). Impulsivity may include difficulties when waiting, interrupting others during conversation or activities, and blurting out answers (Bateman, 2014). In contrast to children with inattentive presentation, children with hyperactivity/ impulsivity presentation, compared to TD children, are more likely to exhibit illusory bias and overestimate their academic performance (Owens, 2002) and peer relationships (Canu & Carlson, 2007).

Symptoms of ADHD convey increased risk for a host of negative outcomes for children with the disorder. Sibley et al. (2014), for example, found a strong correlation between academic

skills and severity of inattention, academic problems, and grade point averages (GPA) Additionally, high school-aged children with ADHD are more frequently absent from school (May et al., 2021), attend more remedial classes (Lawrence et al., 2021), and earn more failing grades than highschoolers not diagnosed with the disorder (Evans et al., 2020). These academic difficulties correspond with lower overall GPAs (Kent et al., 2011), higher dropout rates (Mirza et al., 2018), and higher instances of delinquency (von Polier et al., 2005). Notably, ADHD-related difficulties in childhood and adolescence convey an increased risk for a range of adverse outcomes beyond academia and into adulthood. Halmoy et al. (2009), for example, found that only 24% of adults with ADHD were currently employed compared to the 79% of participants in the population-based control group.

In addition to persistent and lifelong academic and occupational difficulties, individuals with ADHD are at higher risk for comorbid mood (Bond et al., 2012), anxiety (Bain, 2019), and behavioral disorders (Kuhne et al., 1997), and experience impairments in their abilities to exhibit self-control (Unnever & Cornell, 2003), to wait their turn in social contexts (McQuade & Hoza, 2015), to engage in cooperative play (Normand et al., 2019), and to regulate emotions (Tarle et al., 2019). To that end, it is not surprising that children with ADHD tend to have difficulties with poor peer relations (Hoza, 2007; Ros & Graziano, 2018). Indeed, children with ADHD frequently score lower on social preference scales, are less well liked, are commonly rejected by peers, and are less likely to have dyadic friendships, compared to TD children (Hoza et al., 2005). Further, poor peer problems in children with ADHD are correlated with cigarette smoking (Rhodes et al., 2016), delinquency (Egan et al., 2020), and long-term global impairment characterized by behavioral, emotional, and interpersonal impairments (Murg et al., 2012). The significant impact of poor peer relations on the lives of children with ADHD points to a need for

more research, particularly with respect to potential variables that might serve to moderate the magnitude of peer relationship impairments in affected children. Comorbid psychopathology, such as anxiety, is a promising target for such examinations (Bloemsma et al., 2013).

Anxiety disorders are commonly comorbid with ADHD as an estimated 30% of children with ADHD have a comorbid diagnosis of at least one anxiety disorder, which equates to the second highest rate for a comorbid disorder following behavioral disorder diagnoses (CDC, 2021). Notably, presence of a comorbid anxiety disorders appears to exacerbate ADHD-related difficulties with peer problems. For example, Booster et al. (2012) found that children with ADHD and a comorbid internalizing diagnosis exhibited poorer social skills compared to children with only ADHD (Booster et al., 2012). A more recent study similarly found that children with the inattentive or combined presentations of ADHD and two or more comorbid anxiety diagnoses exhibited poorer social functioning compared to children with one or no comorbid anxiety disorder (Sciberras et al., 2014). One study that looked at social functioning widened their focus by including children with ADHD and comorbid anxiety, TD children, and children with an anxiety disorder. Findings from the study suggested that, while children with ADHD and comorbid anxiety had reduced social functioning compared to TD children, children with an anxiety disorder had similar reductions in social functioning (Mikami et al., 2011). In contrast, a similar study done by Lee et al. (2012) found that children with anxiety and TD children did not differ in peer problems (Lee et al., 2012). Collectively, the equivocal finds across studies suggest a need for more research regarding ADHD, comorbid anxiety, and peer problems.

Notably, peer problems in children with anxiety disorders appear to vary depending on the specific anxiety disorder. Scharfstein and colleges (2011) demonstrated that, although

children with a social anxiety disorder (SAD) were less socially competent, had a harder time making new friends, and had fewer total friends, children diagnosed with generalized anxiety disorder (GAD) did not evince significant impairment in peer relationships compared to TD children. Another study by Verduin and Kendall (2008) further emphasizes the findings from Scharfstein et al. (2011). It suggests that while peer liking was negatively correlated with total peer perceived anxiety, peer liking was lower for children specifically having social phobia (Verduin & Kendall, 2008). These studies indicate the importance of differentiating between anxiety presentations when evaluating peer problems, and they raise questions as to whether a similar pattern of findings contributes to variability in peer difficulties among children with ADHD and comorbid anxiety.

The current study examines how different presentations of anxiety potentially moderate the severity of peer problems in children with ADHD and address limitations of previous studies by including teacher and parent reports of ADHD symptoms and peer relations. Additionally, this study addresses limitations of previous studies with respect to anxiety specificity, such that child self-reports of anxiety are used to parse metrics of total anxiety, physical anxiety (i.e., somatic symptoms), worry, and social anxiety.

A priori, parent and teacher ratings of ADHD were expected to be significantly correlated with parent and teacher ratings of child's peer problems, as well as child self-repot ratings of social anxiety, worry, and total anxiety. This prediction is formulated from previous findings suggesting that anxiety and ADHD both have negative effects on peer relations (Hoza, 2007; Ros & Graziano, 2018; Scharfstein et al., 2011; Verduin & Kendall, 2008). Also, child self-report ratings of social anxiety, worry, and total anxiety were predicted to significantly moderate the relationship present between parent and teacher reports of ADHD

symptoms and peer difficulties. This prediction was constructed from prior studies that suggest worry in the form of generalized anxiety disorder and social anxiety have a significant exacerbating effect on peer problems (Scharfstein et al., 2011; Verduin & Kendall, 2008). Physical anxiety was not expected to have a significant moderating effect on the relationship between ADHD symptoms and peer problems. This prediction was derived from a previous study that found physical anxiety to not have a moderating effect (Lea, 2018).

Methods

Participants

Children with and without an ADHD diagnoses and aged 7 to 13 years were recruited from the community and the university-based mental health clinic. Recruitment occurred through communicating with organizations and faculty or staff through fliers and emails. Consent forms were signed by parents in conjunction with assent forms signed by children before participation began. Families of participants received monetary compensation ($140) and/or comprehensive psychoeducational reports describing the results and recommendations from the clinical assessment.

Measures

Predictor Variables. The *Child Behavior Checklist* (CBCL – Ages 6-18) and *Teacher Report Form* (TRF – Ages 6-18) were completed by the child's parents and teachers, respectively (Achenbach, 1991; Achenbach, 1997). The CBCL and TRF provided clinical DSM-oriented scales that correlate with disorders found in the *Diagnostic and Statistical Manual for Mental Disorders, 5th edition* (DSM-V). The CBCL and TRF exhibit strong test-retest reliabilities (0.95-1.00), inter-rater reliabilities (0.93-0.96), and acceptable validity scores

(Achenbach, 1991). The DSM ADHD scale from the CBCL and TRF was used as a continuous predictor variable.

Moderating Variables. The Revised Children's Manifest Anxiety Scales- Second Edition (RCMAS-2; Reynolds & Richmond, 2008a) is a 49-item measure of anxiety-related symptoms in children and adolescents used for self-report. The measure explores four areas of anxiety, including Physiological Anxiety, Worry, Social Anxiety, and Total Anxiety, that are used as the four potential moderating variables. This self-report measure has exhibited acceptable construct validity and strong test-retest reliabilities (0.76 - 0.79, Reynolds &Richmond, 2008b).

Criterion Variables. The Conners 3rd Edition – Parent (C3P), a 110-item measure, was completed by parents to examine their children's behavior from the past month. Teachers completed the Conners 3rd Edition—Teacher (C3T), a 115-item measure using the same scales as the C3P (Conners, 2008). The C3P and C3T have strong psychometric properties including strong internal consistency and test-retest reliability (0.77-0.97, Conners, 2008). The Peer Relations scale from the Connor's Parent and Teacher Forms are present as the criterion variable in moderation analyses

Wechsler Intelligence Scale for Children-Fifth Edition (WISC-V). The WISC-V provides a metric of children's current level of intellectual functioning. The psychometric properties of the WISC-V indicate strong internal consistency and test-retest reliability (Wechsler, 2014). The WISC-V was used to determine study inclusion eligibility (FSIQ > 80) and rule-out the presence of an intellectual disability.

Procedure

The present study was a part of a larger battery of ongoing studies. Children 7 to 13 years from the community and the university based mental health clinic were recruited. Recruitment

occurred through communicating with organizations and faculty or staff through fliers and emails. Caregivers and teachers of the children were mailed and completed broad- and narrow-band standardized rating scales including the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001), Teacher Report Form (TRF; Achenbach & Rescorla, 2001), and Conners-3 Parent and Teacher Ratings (C3P/T; Conners, 2008). Children complete the RCMAS-2. Children were excluded if they presented with (a) gross neurological, sensory, or motor impairment; (b) history of psychosis; (c) history of seizures; and/or (d) a *Wechsler Intelligence Scale for Children-IV or V* (Wechsler, 2003, 2014) Full-Scale IQ (FSIQ) less than 80.

Results

Tier 1: Preliminary Analyses.

All variables were screened for univariate outliers prior to running analyses. Outliers were defined as values at least 3.29 standard deviations above or below the mean for each group (i.e., $p < .001$; Tabachnick & Fidell, 2001). Identified outliers were replaced with a value equal to ±3.29 standard deviations from the mean. No outliers were identified with this procedure.

Participants were comprised of 171 children, ages 7 to 13 (M =9.83, SD= 1.49). 77.8% of participants were male (n=133) and 21.1% were female (n=36). Most participants were Caucasian (74.9%), then other (8.8%), biracial (8.2%), Asian (5.3%), Hispanic (1.2%), and African American (0.6%).

Tier 2: Bivariate Correlations Between ADHD Symptoms, Anxiety, and Peer Problems

Initial Pearson bivariate correlations revealed the ADHD scale for the CBCL was significantly and positively correlated with the ADHD scale from TRF ($r = 0.30$, $p < .01$), the Peer Relations scale from the C3T ($r = 0.31$, $p < .01$), and the Total Anxiety ($r = 0.25$, $p < .01$),

Physical Anxiety ($r = 0.29$, $p < .01$), and Social Anxiety ($r = 0.20$, $p < .05$) scales from the RCMAS-2. Similarly, the ADHD scale from Teacher Report Form was significantly and positively correlated with the Peer Relations scale of the C3P ($r = 0.17$, $p < .05$), the Peer Relations scale of the C3T ($r = 0.25$, $p < .01$), and physical anxiety ($r = 0.22$, $p < .01$). Not surprisingly, Peer relations scale of C3P and the Peer Relations scale of the C3T were positively correlated ($r = 0.16$, $p < .05$), and the Peer Relations scale of the C3T was positively correlate with the Total Anxiety ($r = 0.29$, $p < .01$), Worry ($r = 0.29$, $p < .01$), and Physical Anxiety ($r = 0.25$, $p < .01$) scales from the RCMAS-2. Finally, all anxiety scales were positively correlated with each other (all $p < .01$). The correlation matrix is provided in Table 1.

Tier 3: Examination of the Moderation Effect of Total Anxiety

The overall regression model that included parent ratings of ADHD symptoms, total anxiety, and the interaction between ADHD symptoms and total anxiety as predictors of peer problems was significant, $F(3, 151) = 12.01$, $p < .001$, $R^2 = .19$. The interaction between ADHD symptoms and total anxiety, however, was not significant.

The overall regression model that included teacher ratings of ADHD symptoms, total anxiety, and the interaction between ADHD symptoms and total anxiety as predictors of peer problems was also significant, $F(3, 150) = 21.75$, $p < .001$, $R^2 = .30$. Further, the interaction between ADHD symptoms and total anxiety was significant, suggesting higher teacher ratings of total anxiety were associated with a stronger positive relationship between ADHD symptoms and peer problems. Tables 2 and 3 display the regression values and associated statistics, and Figure 1 provides a visual schematic of the significant moderation effect.

Tier 4: Examination of the Moderation Effect of Physical Anxiety

The overall regression model that included parent ratings of ADHD symptoms, physiological anxiety, and the interaction between ADHD symptoms and physiological anxiety as predictors of peer problems was significant, $F(3, 151) = 12.32$, $p < .001$, $R^2 = .44$. The interaction between ADHD symptoms and physiological anxiety, however, was not significant. Similarly, The overall regression model that included teacher ratings of ADHD symptoms, physiological anxiety, and the interaction between ADHD symptoms and physiological anxiety as predictors of peer problems was significant, $F(3, 150) = 18.36$, $p < .001$, $R^2 = .52$. The interaction between ADHD symptoms and physiological anxiety, however, was not significant.

Tier 5: Examination of the Moderation Effect of Worry

The overall regression model that included parent ratings of ADHD symptoms, worry, and the interaction between teacher rated ADHD symptoms and worry as predictors of peer problems was significant, $F(3, 151) = 12.04$, $p < .001$, $R^2 = .44$. The interaction between ADHD symptoms and worry, however, was not significant.

The overall regression model that included teacher ratings of ADHD symptoms, worry, and the interaction between ADHD symptoms and worry as predictors of peer problems was also significant, $F(3, 149) = 23.27$, $p < .001$, $R^2 = .56$. Further, the interaction between teacher rated ADHD symptoms and worry was significant, suggesting higher teacher ratings of worry were associated with a stronger positive relationship between ADHD symptoms and peer problems.

Tier 6: Examination of the Moderation Effect of Social Anxiety

The overall regression model that included parent ratings of ADHD symptoms, social anxiety, and the interaction between ADHD symptoms and social anxiety as predictors of peer problems was significant, $F(3, 150) = 12.47$, $p < .001$, $R^2 = .45$. The interaction between ADHD symptoms and social anxiety, however, was not significant. Similarly, The overall regression

model that included teacher ratings of ADHD symptoms, social anxiety, and the interaction between ADHD symptoms and social anxiety as predictors of peer problems was significant, $F(3, 149) = 18.28$, $p < .001$, $R^2 = .52$. The interaction between ADHD symptoms and social anxiety, however, was not significant.

Discussion

The present study contributes to current research by examining anxiety as a moderator of the relationship between ADHD symptoms and peer problems. Most interesting was the finding of worry as a moderator of the relationship between parent rated ADHD symptoms and peer problems, consistent with a priori expectations. That is, worry is a primary symptom of Generalized Anxiety Disorder (GAD) (Eng, 2004), which is related to distinct peer problems such as being nonassertive, too accommodating, self-sacrificing, and most notably, intrusiveness and neediness (Eng, 2004). To that end, it appears that worry conveys increased risk for peer problems among children with high ADHD. Further research is needed to determine if the increased peer difficulties reflect a cumulative or compounding effect.

Interestingly, worry was not a significant moderator when parent ratings were examined. Although unexpected, the difference in parent and teacher reports was similarly demonstrated in a previous study that examined GAD and peer relations and found that children with GAD had similar parent ratings compared to TD children (Scharfstein et al., 2011). One potential explanation for the discrepancy across parent and teacher ratings of peer relationships may be due to the varying settings where peer relationships are observed by parents and teachers. Specifically, parents mostly observe their children's peer relationships via didactic friendships and/or small group settings, whereas teachers typically observe a larger sample of peer-to-peer behavior across a broader peer range of children. Indeed, prior studies have reported differences

between teacher reports and parent reports of ADHD symptoms (Papageorgiou et al., 2008) and associated peer problems (Sawyer et al., 1992). Related to this point, teachers generally have a broader sample of children to develop a cognitive representation of normative peer relationships. To that end, the finding in this study suggests that parents of children with ADHD underestimate their children's peer difficulties, such that comorbid anxiety does not present a notable increase in impairment. Additional studies discussing the difference between parent, teacher, and self-reports when looking at the relationship between ADHD symptoms, peer problems, and anxiety would be beneficial for the reliability of future studies in this area.

The finding that social anxiety does not moderate the relationship between ADHD and peer relations was surprising, particularly considering previous findings. For instance, Becker et al. (2015) found that self-reported social anxiety in children with ADHD had a significant effect on youth-reported social skills as well as parent and self-reports of social acceptance (Becker et al., 2015). Additional studies found that social anxiety disorder was associated with lower in peer liking (Verduin & Kendall, 2008) and had a larger magnitude negative impact on children's social relationships when compared to generalized anxiety disorder (Scharfstein et al., 2011). These collective findings starkly contrast the findings of this study, which suggest generalized anxiety (worry), but not social anxiety, was a significant moderator of ADHD-related peer difficulties. One explanation is that parent and teacher reports of children with social anxiety and peer problems are deflated because they are paradoxically less likely to observe overt victimization/bullying by peers. To that end, Early and colleagues (2017) reported that TD girls were more likely to experience victimization/bullying when compared to girls with social anxiety.

No surprisingly and consistent with expectations, physiological anxiety was not a significant moderator of ADHD related peer difficulties. Children with ADHD commonly report more frequent and severe somatic complaints compared to TD children (Rapport et al., 2008). It is likely that a ceiling effect limited the ability to detect an interaction effect, such that adding additional anxiety-related physiological symptoms were unable to create sufficient variability to distinguish children with and without comorbid anxiety. Further research is needed in this area.

The significant effect of total anxiety as a moderator of the relationship between ADHD symptoms and peer problems was not unexpected and appears to be predominantly attributable to the significant interaction between worry and ADHD symptoms. That is, although it is possible that the non-significant interactions for physical anxiety and social anxiety may have contributed by predicting a small portion of residual variance in total anxiety, the primary contributor is most likely worry. It is noted, however, that findings from a previous study suggest that the presence of more than one anxiety disorder is significantly related to increased risk for peer problems (Sciberras et al., 2014).

It is noted that findings from this study parallel findings from a previous study that examined the moderating effect of anxiety on the relationship between ADHD and working memory (Lea et al., 2018). Specifically, Lea and colleagues similarly found that worry had a significant moderating effect on the relationship between ADHD and working memory, but the effects of physical anxiety and social anxiety were not significant. The parallels between the Lea et al.'s (2018) study and the present study suggests a need for further research regarding the relationship between ADHD, working memory, peer relations, and anxiety. Further examination of the complex relationship between these variables hold potential to inform possible

intervention and protective strategies for children diagnosed with ADHD, anxiety, and ADHD with comorbid anxiety.

Studies that target protective factors related to the moderation effect of comorbid anxiety on the relationship between ADHD and peer problems would further current research. One moderating factor of the relationship between ADHD symptoms and poor peer relations that holds promise is increased prosocial skills (Andrade, B. & Tannock, R., 2014). That is, prosocial skills appear to have a mitigating effect on the poor peer relations in children with severe ADHD symptoms. This finding could be beneficial to treating children with ADHD since unmitigated peer problems correlate to adverse outcomes. Prosocial skills were also found to be an important protective factor for peer relations in children with anxiety disorders (Konac, 2021). This similarity might mean that prosocial skills have a protective effect that extends beyond ADHD or anxiety disorders. Prosocial skills could be beneficial for children with ADHD, anxiety, and ADHD with comorbid anxiety. This information would be beneficial to children who struggle with peer relations, their families, and their clinicians.

This study contributes new information about the possible moderating effect of comorbid anxiety on children with ADHD's peer relations, but it does have limitations. One such limitation comes from the lack of temporal precedence. Since peer problems were not manipulated in the lab, children with ADHD and peer problems might have developed symptoms of comorbid anxiety after peer rejection. Further studies that establish temporal precedence will help to strengthen the assertions that come from this study. Additionally, this study did not group children into ADHD and TD, instead a continuous variable of ADHD symptoms was used. This allowed us to look at the range of ADHD symptoms, but it could hinder findings looking at between group differences. Another limitation seen in this study is the lack of an anxiety only

group and an ADHD only group. By looking at the data as continuous measures we cannot see the differences between ADHD only, anxiety only, and ADHD with comorbid anxiety.

Collectively, this study provides a unique contribution to the current body of literature by examining different forms of anxiety as potential moderators of the relationship between ADHD symptoms and peer problems. By separating the presentations of anxiety into total anxiety, physical anxiety, worry, and social anxiety, findings from this study suggest an increased risk of peer problems specifically for children who score high on total anxiety and worry scales. To that end, these findings indicate a need for continued research in this area. These findings apply to many children with ADHD and could help with mitigation techniques in the future.

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Table 1. Bivariate correlations between predictor, moderator, and criterion variables.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) CBCL ADHD	1.00	0.30**	0.07	0.31**	0.25**	0.16	0.29**	0.20*
(2) TRF ADHD		1.00	0.17*	0.25**	0.12	0.05	0.22**	0.03
(3) C3P Peer			1.00	0.16*	-0.01	0.01	-0.06	0.05
(4) C3T Peer				1.00	0.29**	0.29**	0.25**	0.14
(5) TOT					1.00	0.89**	0.76**	0.82**
(6) WOR						1.00	0.52**	0.71**
(7) PHY							1.00	0.47**
(8) SOC								1.00

Note. WOR = Worry T-Score; PHY= Physiological Anxiety T-Score; SOC = Social Anxiety T-Score; TOT= Total Anxiety T-Score; CBCL ADHD= ADHD scale from Child Behavior Check List; TRF ADHD= ADHD scale from Teacher Report Form; C3P-Peer= Peer Relations scale from Conners-Parent; C3T-Peer= Peer Relations scale from Conners-Teacher.

*$p < .05$, **$p < .01$

Table 2. Moderating Effect of Anxiety on Parent-Reported Peer Relations

	B	*SE B*	*t*	*95% C.I.*	*F*	R^2	ΔR^2
Total Anxiety					12.01**	0.01**	0.19
ADHD	0.99	1.29	0.77	-1.56, 3.55			
TOT	0.15	0.21	0.69	-0.27, 0.57			
ADHD x TOT	0.01	0.03	0.37	-0.05, 0.06			
Worry					12.04**	0.19**	0.01
ADHD	2.08	1.21	1.72	-0.31, 4.48			
WORRY	0.29	0.22	1.72	-0.13, 0.72			
ADHD x WORRY	-0.01	0.03	-0.49	-0.07, 0.04			
Physiological Anxiety					12.32**	0.19**	0.02*
ADHD	-0.82	1.30	-0.63	-3.39, 1.75			
PHY	-0.18	0.19	-0.95	-0.56, 0.19			
ADHD x PHY	0.05	0.03	1.85	-0.01, 0.09			
Social Anxiety					12.47**	0.19**	0.01
ADHD	2.13	1.24	1.72	-0.32, 4.58			
SOC	0.33	0.22	1.51	-0.10, 0.76			
ADHD x SOC	-0.01	0.03	-0.52	-0.07, 0.04			

Note ADHD = Attention Deficit Hyperactivity Disorder; WOR = Worry T-Score; PHY= Physiological Anxiety T-Score; SOC = Social Anxiety T-Score; TOT= Total Anxiety T-Score.

*$p < .05$, **$p < .01$

Table 3. Moderating Effect of Anxiety on Teacher-Reported Peer Relations

	B	*SE B*	*t*	*95% C.I.*	*F*	R^2	ΔR^2
Total Anxiety					21.75**	0.30**	0.02*
ADHD	-0.54	0.66	-0.82	-1.85, 0.76			
TOT	-1.37	0.77	-1.78	-2.89, 0.15			
ADHD x TOT	0.03*	0.01*	2.16*	-0.03, 0.06*			
Worry					23.27**	0.32**	0.02*
ADHD	-0.33	0.56	-0.58	-1.44, 0.78			
WORRY	-1.19	0.69	-1.73	-2.55, 0.17			
ADHD x WORRY	0.03**	0.01**	2.19**	0.01**, 0.05**			
Physiological Anxiety					18.36**	0.27**	0.01
ADHD	-0.08	0.69	-0.11	-1.46, 1.29			
PHY	-0.89	0.76	-1.18	-2.39, 0.60			
ADHD x PHY	0.02	0.02	1.40	-0.01, 0.05			
Social Anxiety					18.28**	0.27**	0.01
ADHD	0.38	0.59	0.65	-0.79, 1.56			
SOC	-0.56	0.74	-0.76	-2.02, 0.90			
ADHD x SOC	0.01	0.01	0.95	-0.01, 0.04			

Note ADHD = Attention Deficit Hyperactivity Disorder; WOR = Worry T-Score; PHY= Physiological Anxiety T-Score; SOC = Social Anxiety T-Score; TOT= Total Anxiety T-Score.

*$p < .05$, **$p < .01$

1. Total anxiety as moderator of teacher-rated ADHD-related peer problems

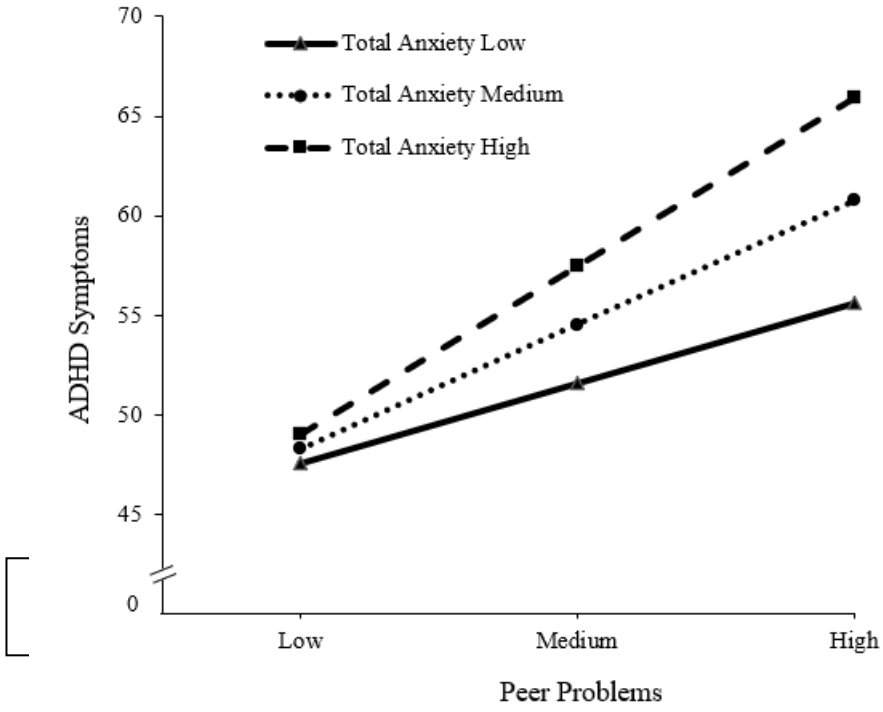

Figure 2. Worry as a moderator of teacher-rated ADHD-related peer problems