

Examining Resiliency in Children With Learning Disabilities and Co-occurring ADHD Symptoms: The Protective Role of a Close Teacher-Student Relationship

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Difficulties of inattention, hyperactivity and impulsivity frequently co-occur with learning disabilities (LD) in childhood (Riccio et al., 1994; Silver, 2004), and are associated with increased risk for maladaptive academic and social-emotional outcomes (Morrison & Cosden, 1997; Bender, 2008). The present study endeavored to further our understanding of protective factors for children with LD who have co-occurring ADHD symptoms by examining the moderating role of the student-teacher relationship. Data was collected from teachers of students with LD who presented with ADHD symptoms in nine public schools. The sample included 81 students: 54 boys and 27 girls (Age: M_{boys} = 12.0 (1.14) M_{girls}= 11.7 (1.20), M_{total}= 11.9(1.16); Grade: M_{boys}= 6.7 (1.12), M_{girls}= 6.5(1.19), M_{total}=6.7(1.15)) and 79.5% were native English speakers. Step-wise regression analyses were performed to assess the moderating role of student-teacher closeness in the relationship between symptoms of ADHD and both academic and socioemotional resilience factors. Results supported that a close student-teacher relationship diminishes the negative associations between symptoms of ADHD and various academic and socioemotional markers, suggesting that students with LD are more resilient when they have a close relationship with their teachers. These findings are discussed in relation to existing literature and demonstrate the importance of promoting positive student-teacher relationships for students with LD.

Keywords: **learning disabilities, ADHD, teacher-student relationship, resiliency**

Introduction

Up to 70% of children with learning disabilities (LD) have comorbid symptoms of ADHD - inattention, hyperactivity, and impulsivity (Mayes et al., 2000). Students who have LD and comorbid ADHD symptoms are impaired academically

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by both their ADHD-related symptoms as well as their specific learning impairments. For instance, children with both have more severe learning challenges and attention problems than children with either disorder alone (Mayes et al., 2000). In addition, the impairments experienced by students with both of these disorders often go beyond academic challenges and extend into other domains of functioning. For instance, adolescents with comorbid LD and ADHD reported being stressed in the classroom, feeling tired, having arguments with their close friends and having low self-esteem (Brook & Boaz, 2005). Evidently, students with comorbid ADHD symptoms are at-risk of negative academic and personal wellbeing outcomes (Al-Yagon, 2009; Mayes et al., 2000). Identifying factors that may alter these negative trajectories may have important implications for promoting resiliency for children with LD.

Resiliency

Resilience theory describes the human phenomenon of successfully adapting in face of significant stressors (Masten, 2001; 2018). In developmental psychology, this concept is often applied to understand the factors that promote adaptive functioning among children who face chronic stress. At its core, research in this domain attempts to identify factors that promote resilience (e.g. strengths, or protective factors) to avert negative developmental trajectories in childhood. Encompassed in resiliency theory is the protective model, which is represented by assets and resources that have a *moderating* effect on the relationship between risk and negative outcome. Resilience, therefore, may involve building and developing protective factors, such as critical assets and resources that will serve as tools for an individual when facing risks or adversity (Dvorsky & Langberg, 2016; Fergus & Zimmerman, 2005). When seeking to understand the developmental outcomes of students with comorbid LD and ADHD symptoms, resiliency can be examined in relation to both academic functioning and social-emotional functioning.

Academic Resiliency

In the school context, resilience can refer to the likelihood of academic success despite adversities resulting from early traits, conditions, or experiences (Martin & Marsh, 2006). Children with LD experience a plethora of challenges over the course of their early academic years (Kavale & Forness, 1996; Lange & Thompson, 2006), and as such, most likely have histories of chronic environmental academic-related stress. Indeed, the presence of ADHD symptoms was found to contribute significantly to academic adversity, above and beyond other personal and contextual factors (Martin, 2014). In students with LD who also display ADHD symptoms, the cognitive and academic deficits have consistently been found to be more acute (Mather, 2007). As such, resilience theory, when applied in the educational context, can be used to conceptualize factors that may promote academic success in spite of these challenges. Among typically-developing children, several protective factors have been identified as promotive of academic resilience among children. Tudor and Spray's (2017) systematic review identified individual factors (high self-esteem, self-efficacy, autonomy, engagement in school, value in school) and environmental factors (parent involvement, social ties at school, and classroom environment) that constitute academic resilience. Because these variables promote academic achievement in spite of adversity and risk, they may be considered factors of academic resilience.

One element of the classroom environment that may be related to academic resilience in students is the quality of the teacher-student relationship. Positive student-teacher relationships are characterized by close, warm, and non-conflictual relationships in the classroom setting (Furrer et al., 2014; Hamre & Pianta, 2005; Toste et al., 2010). This type of relationship has been shown to be beneficial for both typically-developing students and children at-risk who face academic adversity across grade levels (Baker et al., 2008; Bronfenbrenner & Morris, 1998; McCormick et al., 2013). By offering security and stability, a positive student-teacher relationship influences student academic skills, sense of belonging, and well-being (Hamre & Pianta, 2001; Hughes et al., 2001; Midgley et al., 1989; Murray & Greenberg, 2006; Murray & Malmgren, 2005).

A positive student-teacher relationship is particularly important for students who are at risk academically. In one longitudinal study, positive teacher–student relationships were found to play a compensatory role in the relationship between task accuracy and academic performance (Liew et al., 2010). That is, when matched with a supportive teacher, children with low task accuracy performed at the same level as those with high task accuracy a year later. Importantly, the effect of a positive teacher–student relationship on academic achievement was especially protective for students presenting with risk factors for poor academic achievement, such as low effortful control and low attention-related skills. In fact, positive teacher-student relationships have been associated with positive academic outcomes for children at risk of academic problems due to a range of issues, such as difficulties with behavior, inhibitory control, and attention (Graziano et al., 2007; Hughes et al., 1999; Pianta et al., 1997; Pianta & Walsh, 1996; Wentzel, 2002). Accordingly, it is possible that a closer student-teacher relationship that includes more warmth and less conflict may promote resilience among students who face more academic adversity than their typically developing peers, such as those with LD and symptoms of ADHD.

Social-Emotional Resiliency

In addition to academic difficulties, children and adolescents with LD often encounter socioemotional difficulties (Silver, 2004). For instance, individuals with LD report experiencing higher levels of stress associated with frustration, lower self-concept, and emotional problems (Margalit, 2004; Miller, 2002; Morrison & Cosden, 1997). Lower levels of academic achievement and difficulties in social contexts at school further contribute to students' self-perception (Ofiesh & Mather, 2013). The combination of these risk factors is related to poor peer relationships and increased anxiety and depression (Morrison & Cosden, 1997; Silver, 2004). In terms of social relationships, studies have shown that from a young age – even before an LD diagnosis – students with emerging learning difficulties can display impaired relationships with same-aged peers (Kavale & Forness, 1996). The use of social skills, such as reading and understanding body language and recognizing social cues is challenging for these students, and such impairments, are linked with less social acceptance, alienation, loneliness (Bender, 2008; Silver, 2004), and difficulties with conversational competence (Bryan et al., 1981). In contrast, Miller (2002) found that special friendships and an encouraging teacher were signs of better social outcomes among students with LD.

Like with academic outcomes, the student-teacher relationship is also associated with social-emotional functioning. For instance, Murray & Zvoch (2011) demonstrated that negative teacher-student relationship, such as those with conflict, were related to increases in student difficulties with mood. Similarly, Arbeau et al. (2010) found that closer student and teacher relationships were related to increased prosocial behavior and decreased anxiety and school avoidance, while more conflictual relationships were related with less prosocial behavior and increased anxiety and school avoidance. There are numerous examples of these types of studies that draw attention to the effect of the student-teacher relationship on socioemotional factors, particularly for at-risk students (Copeland-Mitchelle et al., 1997; Hughes et al., 1999; Meehan et al., 2003; Pianta & Steinberg, 1992). As such, the teacher-student relationship may be another important source of resiliency among students with LD.

Current Study

To further our understanding of the protective factors that play a role in academic and social-emotional functioning among students with LD, the current study aimed to explore the student-teacher relationship of students with LD and co-occurring ADHD symptoms. Research to date has demonstrated that attention difficulties are related to poor academic outcomes, and that students with LD and co-occurring symptoms of ADHD demonstrate more severe academic and social-emotional problems (Al-Yagon, 2009; Mayes et al., 2000). As such, it was hypothesized that ADHD symptoms would be related to lower levels of indicators of resilience – both academic and social-emotional. Because of the strong evidence demonstrating protective effects of a supportive teacher-student relationship on academic and socioemotional outcomes with at-risk students (Liew et al., 2010), the moderating effect of a close teacher-child relationship was examined in this association. It is hoped that the findings of this study will have implications for promoting resilience among students with LD.

Methodology

Participants

Data was collected from the teachers of eighty-eight students aged 6 to 12 years from nine schools in an urban public-school district. The students were diagnosed with a LD by a Clinical or School Psychologist. The students were enrolled in a 50/50 program where half of their day was spent in their home classroom and half was spent in a specialized instruction class. The sample included 81 students: 54 boys and 27 girls (Age: M_{boys} = 12.0 (1.14) M_{girls}= 11.7 *(1.20)*, M_{total}= 11.9*(1.16)*; Grade: M_{boys}= 6.7 *(1.12)*, M_{girls}= 6.5*(1.19)*, M_{total}=6.7*(1.15)*) and 79.5% were native English speakers. Postal code data were used to gather broad socio-demographic indicators on participating families. Based on these analyses, an estimated 31.3% of the students in the study had family income level of under $50,000, 37.3% had family income level of $50,000-99,999, 19.7% had a family income level of $100,000-$149,999 and 11.8% had an income range of $150,000 and over.

Procedure

This study received ethical approval from the corresponding author's university's research ethics board. Consent forms along with a letter describing the study were given to parents in advance and returned to the students' schools. Each student was assigned an identification number in order to conserve confidentiality, and a battery of questionnaires was given to each student's specialized class teacher. The questionnaires were given to the teachers during a time slot during a professional development day. The goals of the project were described to the teachers and time was provided to complete the questionnaires for each of the participating students. The researchers were present and invited and answered questions from teachers as they came up. After completing the questionnaires, teachers received a $20.00 gift card to a local bookstore as compensation.

Measures

Social-Emotional Resilience

Social-emotional resilience was assessed using the teacher version of the *Social-Emotional Assets and Resilience Scale* (SEARS; Merrell et al., 2011) – a questionnaire that broadly assesses students' self-regulation, social competence, empathy, and responsibility with a total resilience score. The individual items are phrased as desirable positive characteristics, with four choices of answers ranging from 0 = never to 3 = always (e.g. "knows how to calm down when stressed/upset", "understands people can feel different about same thing", and "works well with others on group project"). Higher score values correspond to teacher perceptions of higher level of resilience. The SEARS-T has been found to have strong psychometric properties in previous research (internal reliability = .98 and the test-retest reliability = .94; Cheng & Ray, 2016).

Academic Resilience

The *Academic Competence Evaluation Scales – Teacher* (ACES-T: DiPerna & Elliott, 2000) was used to assess academic resilience. This questionnaire consists of items rated on a 5-point scale ranging from 1 (Never) to 5 (Almost Always). Three subscales were used – motivation (e.g., Assumes responsibility for own learning), engagement (i.e., "Asks questions about tests/projects"), and study skills (i.e., "Finishes class work on time"). Extensive research has demonstrated that the ACES-T is a reliable and valid assessment for students from kindergarten to college-age and has been found to have adequate psychometric properties (internal consistency = 94 - .99, test-retest reliability = .88 - .97, validity =.66 -.80, DiPerna & Elliot, 1999; 2000).

ADHD Symptoms

Students' inattention and hyperactivity/impulsivity were examined using the *Strengths and Weakness of ADHD Symptoms and Normal Behaviour Scale: Teacher Form* (SWAN-T). On this scale, the teacher is asked to compare the participating child to other children of the same age group, based on observations within the past month. There are seven response options for each question, ranging from "far below average" to "far above average". Each question is related to ADHD symptoms of either attention or hyperactivity/impulsivity, yielding a total score that reflects the severity

of symptoms on the ADHD spectrum (e.g. "Give close attention to detail and avoids careless mistakes" and "Modulate motor activities"). The scores on this measure were inverted to facilitate interpretation of our research question. As such, a higher score on the SWAN now represents increased presence of symptoms of inattention or hyperactivity/impulsivity. The SWAN has been found to have adequate psychometric properties (internal reliability = .95, test-retest reliability =.76).

Student-Teacher Relationship

The short form of the *Student-Teacher Relationship Scale* (STRS; Pianta, 2001) was used to assess the student-teacher relationship - a self-report questionnaire composed of 15 items that measure two dimensions: Closeness (seven items) and Conflict (eight items). Because we were interested in identifying protective factors, the closeness scores were used for the analysis. Teachers choose from a 5-point Likert's scale (1-definitely does not apply to 5-definitely applies) to answer questions, such as "I share an affectionate, warm relationship with this child." and "This child spontaneously shares information about himself/herself." The STRS closeness scale has been shown to have adequate psychometric properties (internal reliability = .86, test-retest reliability = .88).

Results

Data Analytic Approach

A series of regression analyses were used to explore the moderation effect of closeness on the relationship between ADHD symptoms and measures of academic and social-emotional resilience in this sample of students with LD. The predictor variables included in the moderation were inattention and hyperactivity/impulsivity symptoms, the outcome variables were academic (ACES-T) and social-emotional (SEARS-T) resilience. The moderator was student-teacher closeness, as measured by the STRQ. Table 1 provides the means and standard deviations for the independent and dependent variables. All study variables were normally distributed. Correlation analyses were run to determine the relationship among the variables of interest (see Table 2).

Table 1. ***Descriptive Statistics***

Variable	N	Mean	Std. Deviation
Engagement	83	3.1175	.89104
Motivation	83	2.5706	.89223
Study Skills	77	2.6623	.74702
Total Resiliency	83	41.73	8.991
Closeness	83	3.9191	.66078
Inattention (reversed)	83	5.8996	1.29851
Hyperactivity/Impulsivity(reversed)	83	4.4351	1.35830

Table 2. ***Correlations***

Measure	ACES Engagement	ACES Motivation	ACES Study Skills	SEARS Total	STRS Closeness	STRS Conflict	SWAN Inattention
ACES Engagement	-						
ACES Motivation	.654**	-					
ACES Study Skills	.601**	.862**	-				
SEARS Total	.634**	.717**	.611**	-			
STRS Closeness	408**	.340**	.336**	.372**	-		
STRS Conflict	-.288**	-.371**	.436**	-.522**	-.157	-	
SWAN Inattention	-.548**	-.829**	-.790**	-.635**	-.203	.309**	-
SWAN Hyperactivity/ Impulsivity	-.253*	-.545**	-.541**	-.590**	-.009	.464**	.732**

**Correlation is significant at the 0.01 level
*Correlation is significant at the 0.05 level

The initial analyses indicated a potential multicollinearity effect between the interactions and other terms in the model. This was not resolved by standardizing the variables and creating an interaction term based on raw variables and including standardized values – the VIF values were above 10. To address this multicollinearity issue, we explored using the moderator variable as a categorical variable by dividing the scores between low, medium, and high closeness. The results of the analysis with the categorical moderator variable were the same as the results of the analysis when the moderator was continuous. Thus, the results presented here are those using the moderator as a continuous variable for ease of interpretation.

Moderation Analyses

Results of the moderation analyses are presented in Tables 3-6. Regression-based stepwise analyses were used to test the moderation effect of student-teacher closeness. The predictors, inattention and hyperactivity/impulsivity, were included individually in step 1 of separate moderation analyses. Next, the interaction term between the predictor and closeness was added to the model.

Table 3. *Moderation Effects of Student-Teacher Relationship on Social Skills*

Model	Variable	R	R^2	R^2 Change	F Change	Df1	Df2	Sig. F Change
Inattention								
1	Inattention	.635	.403	.403	54.659	1	81	.000
2	Inattention x closeness	.676	.457	.054	7.981	1	80	.006
Hyperactivity								
1	Hyperactivity/ Impulsivity	.590	.348	.348	43.315	1	81	.000
2	Hyperactivity/ Impulsivity x closeness	.666	.444	.095	13.738	1	80	.000

Table 4. ***Moderation Effects of Student-Teacher Relationship on Engagement***

Model	Variable	R	R^2	R^2 Change	F Change	Df1	Df2	Sig. F Change
Inattention								
1	Inattention	.548	.300	.300	34.714	1	81	.000
2	Inattention x closeness	.623	.388	.088	11.475	1	80	.001
Hyperactivity								
1	Hyperactivity/ Impulsivity	.253	.064	.064	5.556	1	81	.021
2	Hyperactivity/ Impulsivity x closeness	.427	.183	.118	11.590	1	80	.001

Table 5. ***Moderation Effects of Student-Teacher Relationship on Motivation***

Model	Variable	R	R^2	R^2 Change	F Change	Df1	Df2	Sig. F Change
Inattention								
1	Inattention	.829	.688	.688	178.318	1	81	.000
2	Inattention x closeness	.848	.720	.032	9.127	1	80	.003
Hyperactivity								
1	Hyperactivity/ Impulsivity	.545	.297	.297	34.282	1	81	.000
2	Hyperactivity/ Impulsivity x closeness	.630	.397	.100	13.236	1	80	.000

Table 6. *Moderation Effects of Student-Teacher Relationship on Study Skills*

Model	Variable	R	R^2	R^2 Change	F change	Df1	Df2	Sig. F Change
Inattention								
1	Inattention	.790	.624	.624	124.384	1	75	.000
2	Inattention x closeness	.802	.643	.019	4.004	1	74	.049
Hyperactivity								
1	Hyperactivity/ Impulsivity	.541	.293	.293	31.089	1	75	.000
2	Hyperactivity/ Impulsivity x closeness	.622	.387	.094	11.354	1	74	.001

Inattention and Resiliency Outcomes: The Moderating Role of Student-Teacher Closeness

The results indicate that the student-teacher closeness significantly moderated the negative effect of inattention symptoms on social-emotional resilience (ß = .346, LB = .917, UB= .453). That is, when students with LD have a closer relationship with their teachers, the adverse effects of inattention are partially negated, and they show higher levels of social-emotional assets (such as self-regulation and prosocial skills).

Likewise, student-teacher closeness significantly moderated the negative effect of inattention symptoms on some of the indicators of academic resilience: engagement (ß = .440, LB = .028, UB = .108) and motivation (ß = .266, LB = .014, UB =.068), but not study skills (ß = .346, LB = .917, UB= .453). These findings indicate that when students with LD and inattention have a closer relationship with their teachers, they are more likely to be engaged and motivated in the classroom. However, a close teacher-student relationship did not have a moderating effect between inattention and study skills.

Hyperactivity/Impulsivity and Resiliency Outcomes: The Moderating Role of Student-Teacher Closeness

When hyperactivity/impulsivity symptoms were examined, teacher-student closeness significantly moderated the negative effect of these symptoms on social-emotional resiliency (ß = .625, LB = .429, UB = 1.425). That is, when students with LD and co-occurring symptoms of hyperactivity/impulsivity had closer relationships with their teachers, they were more likely to show improved social-emotional functioning.

In relation to academic resiliency, teacher-student closeness affected the relationship between hyperactivity/impulsivity and motivation (ß = .639, LB = .043, UB = .145), as well as study skills (ß = .575, LB = .030, UB = .119), but not engagement (ß = .696, LB = .043, UB = .162). That is, when students with LD and co-

occurring symptoms of hyperactivity/impulsivity had closer relationships with their teachers, they were more likely to be motivated in the classroom and demonstrate improved study skills. However, the teacher-student relationship does not influence how hyperactivity/impulsivity affect a student's level of engagement in the classroom.

Discussion

The overarching goal of this study was to examine whether a close student-teacher relationship influences the adverse relationship between ADHD symptoms and resiliency among students with LD. Moderation analyses were conducted to investigate the degree to which student-teacher closeness impacted the relationship between ADHD symptoms (inattention and hyperactivity/impulsivity) and indicators of academic and social-emotional resiliency. Results showed that both inattention and hyperactivity/impulsivity are negatively associated with academic and social-emotional resiliency for children with LD. Student-teacher closeness had a significant moderating effect on the relationship between both ADHD symptom types and various academic indicators as well as social-emotional functioning. Overall, these results do suggest that a close student-teacher relationship promotes social-emotional and academic resiliency among students with LD, protecting against the risk that is posed by comorbid symptoms of ADHD.

Socioemotional Resiliency

Both ADHD symptoms had a significantly negative effect on social-emotional resiliency, indicating that children with higher levels of inattention and hyperactivity/impulsivity had weaker overall social-emotional assets, such as self-regulation, social competence, empathy, and responsibility. This is consistent with previous research that has shown that students with inattention and hyperactivity difficulties demonstrate more impaired social-emotional skills (Pianta & Stuhlman, 2004; Semrud-Clickeman & Shafer, 2000). Teacher-student closeness moderated this relationship for both symptoms, thereby reducing the negative impacts of ADHD symptoms on social-emotional functioning. A close student-teacher relationship is represented by warmth, comfort, and trust (Mason et al., 2017), and has previously been shown to have positive effects on socioemotional wellbeing, particularly among at-risk students, such as shy students (Arbeau et al., 2010) and those with aggressive behaviors (Hamre & Pianta, 2001). These findings extend past research by suggesting that this quality of relationship can also have a protective effect among students at risk of socioemotional difficulties due to comorbidities of learning challenges.

Academic Resiliency

Symptoms of ADHD were negatively associated with all of the academic behaviors measured – engagement, study skills, and motivation. This is consistent with previous research showing that students with symptoms of ADHD struggle with these types of skills (Mautone et al., 2011; Volpe et al., 2006). On a whole, teacher-student closeness did reduce the negative association between ADHD symptoms and these academic behaviors, which is consistent with the resilience model proposed. However, there were a few differences in these relationships based on ADHD symptom type. The student-teacher relationship did not have an impact on the relationship

between symptoms of inattention and study skills, despite the moderation existing for hyperactivity. Further, while the strongest moderation effect in all of the analyses was for the relationship between inattention and engagement, there was no moderating effect in relation to hyperactivity. This is surprising, given a prior meta-analysis that found medium to large associations between positive teacher-student relationships and student engagement (Roorda et al., 2011). While this strong relationship was found to protect against the negative effects of inattention in our study, it did not for hyperactivity. In these cases, the effects of the ADHD symptom appear resistant to these positive influences and may require more direct intervention. The current literature has not focused on examining the nature of student-teacher relationships based on ADHD symptoms dimension (Ewe, 2019; Rushton et al., 2020). Our findings suggest that inattention and hyperactivity offer different challenges for academic difficulties and response to resiliency factors, highlighting the importance of examining these symptoms separately, as done here.

Limitations and Future Directions

Some factors limit our ability to draw conclusions from the present study. For instance, we did not have access to more details about the students' academic profile and demographic information. The cross-sectional study design also limits the generalization of findings. This sample of students fell within the middle-class income range. The students also had a unique set up where they split the day between their main classroom and special education classrooms. Our small sample size also prohibited additional analyses of variables like child and teacher gender. Additionally, the questionnaires were only given to the teachers in this study, which offers only one view of the students' ADHD symptoms, the quality of the teacher-student relationships, and the indicators of student resiliency. Finally, we must acknowledge reporter bias. Future research with larger samples, more raters, and more detailed background information will enrich our understanding of these relationships.

Despite these limitations, however, this study adds to the large body of literature that highlights the importance of a positive student-teacher relationship for at-risk students, such as those with LD and co-occurring ADHD symptoms. To promote resiliency for students with LD, the student-teacher relationship may be a malleable target that can help improve outcomes for such at-risk students. It follows that teachers may benefit from supplemental support or training that aims to foster a close relationship with students with LD and co-occurring ADHD symptoms as a means for promoting resilience for these students.

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