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Moderators of Academic Performance and Symptom Severity in Adolescents with Attention-Deficit/Hyperactivity Disorder

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MODERATORS OF ACADEMIC PERFORMANCE AND SYMPTOM SEVERITY IN ADOLESCENTS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
Requirements for the degree of
Doctor in Philosophy

in

The Department of Psychology

by

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ABSTRACT

Research has documented the relationship between attention-deficit/hyperactivity disorder (ADHD) symptom severity and poor academic outcomes. However, few studies have focused on identifying moderating variables of academic performance specific to adolescents, especially those with ADHD. The current study seeks to address these limitations, further exploring moderators of academic outcomes in a clinical sample of adolescents with ADHD. Specifically, the present study examined adolescent ratings of routines, parent-adolescent conflict, perceptions of parental involvement, and school engagement, on the relationship between ADHD symptom severity and academic performance (GPA). The sample consisted of a total of 140 caregiver-adolescent dyads ranging from ages 11- to 17-years in a sample of adolescents with ADHD. Hierarchical regression analyses revealed that adolescent report of school engagement moderated the relationship between ADHD symptom severity and adolescent GPA. Routines, parent-adolescent conflict, and perceptions of parental involvement were not supported as moderators of the relationship between ADHD symptom severity and academic outcomes.

INTRODUCTION

Attention-deficit/hyperactivity disorder (ADHD) is a neurodevelopmental disorder characterized by symptoms of inattention, hyperactivity/impulsivity, or a combined subtype (American Psychiatric Association, 2013). Within the United States, the prevalence rates of ADHD are 9%-11% for children ages 4-17. ADHD is more commonly observed in boys by a 3:1 ratio (Gerson, 2002; Polanczyk, De Lima, Horta, Biederman, & Rohde, 2007). Symptoms of ADHD remain stable throughout early adolescence into adulthood (Barkley, 2015). Specifically, 56% of individuals diagnosed with ADHD continue to exhibit clinically significant symptoms into adolescence (DuPaul & Stoner, 2014). However, there is typically a shift in symptom presentation, where hyperactive symptoms decrease and symptoms of inattention persist, as a child transitions into adolescence (Barkley, 2015; Laufer & Denhoff, 1957; Solomons, 1965; Wasserstein, 2005; Willcutt et al., 2012).

Evidence suggests that early adolescence may be a particularly challenging stage of development for those with ADHD, which may result from the wide range of adjustment and daily living problems experienced by this age group (Jacobson, Williford, & Pianta, 2011; Langberg et al., 2008). For example, adolescents with ADHD consume more alcohol and use tobacco products than their non-ADHD peers, and these behaviors continue into adulthood (Charach, Yeung, Climans, & Lillie, 2011). Adolescents with ADHD often experience academic problems, including underachievement, grade retention, suspensions, and early school dropout, all of which result in lasting consequences (Barkley, 2002; Barry, Lyman, & Klinger, 2002; Daley & Birchwood, 2010; Fabiano et al., 2006). Additionally, the relationship between adolescent delinquency and ADHD symptoms is mediated by low levels of academic achievement (DuPaul & Langberg, 2015). However, an adolescent's conduct difficulties may be

moderated by parental monitoring, which helps to mitigate the risks associated with ADHD and comorbid conduct problems (Molina et al., 2012).

Executive Functioning & Self-Regulation

ADHD is often viewed as a disorder of executive functioning and individuals with this clinical diagnosis tend to experience difficulties with self-regulation (Barkley, 2015; Martinussen, Hayden, Hogg-Johnson, & Tannock, 2005). Executive functioning includes skills necessary for planning, as well as the regulation of thoughts, behavior, and emotion, thereby enabling proper self-control (Barkley, 2015; Van der Oord, Daley, Maric, Prins, & Ollendick, 2015). In adolescents with ADHD, executive functioning deficits include poor self-regulation and a lack of skills important for independent functioning, including initiating and completing tasks (Wasserstein, 2005). As such, adolescents with ADHD experience deficits in organization, time and money management, and other regulatory skills related to self-care (Barkley, 1998; Hinshaw et al., 1993; Nigg, 2006; Wolf & Wasserstein, 2001).

Due to difficulties in self-regulation, adolescents with ADHD are more likely to be impatient and exhibit low frustration tolerance (Wasserstein, 2005). In turn, parents of adolescents with ADHD report increased conflicts due to their adolescent's poor self-management. Oftentimes parent-adolescent interactions are highly conflictual (Mash & Barkley, 2003), and a coercive and authoritarian parenting style results due to the increased conflict between parents and their ADHD adolescent (Deault, 2010; Johnston, Mash, Miller, & Ninowski, 2012; Mash & Barkley, 2003; Patterson, 1982).

Developmental Considerations of Adolescents with ADHD

From a developmental perspective, ADHD symptoms and poor executive functioning coincides with transitional periods, thus exacerbating the various challenges presented in

adolescence (Barkley, 2015). Individuals with ADHD often experience a decline in grades when transitioning from elementary to middle school. However, academic difficulties manifest differently throughout development in ADHD adolescents (Barkley, 2015).

The novel demands placed on teenagers transitioning into middle and high school, such as the increase in independence, navigation of difficult social dynamics, and general exposure to risky behaviors, may be challenging for youth with ADHD (Evans et al., 2016; Rubin et al., 2008). In high school, adolescents are expected to gain information from printed or online materials and lectures, demonstrate knowledge through tests, express information in writing, and demonstrate a broad set of cognitive strategies (DuPaul & Stoner, 2003; Robin, 1998).

Although highly intelligent adolescents with ADHD often do not struggle in elementary school, they may experience difficulties in middle and high school because academic demands increase dramatically (Evans, Langberg, Schultz, Vaughn, Altaye, Marshall, & Zoromski, 2016). For example, ADHD adolescents are required to devote long hours to different academic tasks, including studying and paper writing, which requires full concentration (Robin, 1998). Academic assignments also likely require advanced skills, such as long-term planning requiring executive functioning, and adolescents are expected to work more independently than in elementary school (Evans, Serpell et al., 2005). Finally, adolescents with ADHD are typically required to attend classes with several teachers, and thereby varying expectations and formats of information presented, while navigating a variety of assignments throughout their secondary school experience (Evans, Allen, Moore, & Strauss, 2005).

Academic Difficulties

Academic functioning is regarded as one of the most critically impairing domains for adolescents with ADHD (Wolraich et al., 2005). With the combination of increased academic

demands and poorly developed executive functioning skills, teenagers with ADHD often demonstrate difficulty with mathematics, reading comprehension, and writing (DuPaul & Langberg, 2015; Frazier, Youngstrom, Glutting, & Watkins, 2007). Specific problems that these adolescents encounter may include trouble completing homework, inadequate test preparation, and poor time management, which negatively impacts academic performance (Barkley, 2015; Robin, 1998).

An adolescent's presentation of ADHD symptoms, including number of symptoms and developmental stage (e.g., secondary school), also contributes to academic trajectory. For example, Birchwood & Daley (2012) found that adolescents with a greater number of ADHD symptoms are more likely to encounter academic difficulties overall, and are at increased academic risk during the transitional periods of middle and high school (Barkley, 2015; DuPaul & Stoner, 2014; Zendarski, Sciberras, Mensah, & Hiscock, 2017). Additionally, inattention symptoms are the most significant predictor of academic problems in a clinical population of adolescents with ADHD (DuPaul & Langberg, 2015). As such, it is important to examine how certain variables may influence, or moderate, the relationship between adolescent ADHD symptomatology and academic performance.

Adolescent Routines

Routines can be defined as observable behaviors that occur repetitively at the same time and place, as well as in the same order (Systma, Kelley, & Wymer, 2001). Routines generally include direct involvement of an adolescent and someone who is acting within a "supervisory role" (e.g., parent or teacher; Systma, Kelley & Wymer, 2001). Research has demonstrated that consistent and structured routines greatly contribute to a child's wellbeing throughout their development and into adolescence (Bloomquist, 2005; Fiese, 2006; Koome, Hocking, & Sutton,

2012). Conversely, adolescents with emotional and behavioral problems (e.g., ADHD) tend to exhibit fewer routines, such as family routines, than their well-adjusted counterparts (Kiser et al., 2015).

Routines operate by creating an environment that incorporates both structure and predictability (Koblinsky, Kuvalanka, & Randolph, 2006). The presence of routines helps facilitate an adolescent's orientation to previous directions, and completion of a given activity at the same time, place, and sequence often increases the adolescent's compliance (Sysma et al., 2001). Certain capabilities, such as organizational (Evans, Schultz, White, Brady, Sibley, & Eck, 2009), time-management (Liu, Rijmen, MacCann, & Roberts, 2009), and self-monitoring skills (Chafouleas, Sanetti, Jaffery, & Fallon, 2012; Faul, Stepensky, & Simonson, 2011), contribute to positive academic adjustment and are also important to developing autonomy during adolescence. Adolescents who establish and adhere to routines generally experience greater academic success than those who do not (Roche & Ghazarian, 2012).

The literature often focuses on family routines and their impact on academic outcomes in adolescents. Family routines are positively associated with overall academic success, as well as higher academic achievement and educational expectations over time (Roche & Ghazarian, 2012; Taylor & Lopez, 2005). Additionally, family routines are associated with adolescents' school attendance and attention to schoolwork (Taylor & Lopez, 2005). Students' attendance and attention have been found to impact family routine, academic achievement, and problem behaviors displayed by an adolescent (Taylor & Lopez, 2005). Specifically, school attendance and attention promote academic achievement and diminish the likelihood that an adolescent will exhibit maladaptive behavior (Taylor & Lopez, 2005).

With regard to ADHD adolescents, Sibley et al., (2016) found that a lack of organizational skills, time management, and planning was associated with academic failure. As such, it may be critical to examine how routines influence the relationship between adolescents with ADHD and their academic outcomes, considering that the implementation of structured routines is beneficial to ADHD youth (Thompson & Meyer, 2009). Additionally, the use of family routines to assess adolescent behaviors may not be sufficient in order to fully understand how routines associate with academic performance outcomes.

Communication

The implementation of routines is facilitated by effective, positive communication between adolescents and their parents (Harris et al., 2014). Positive parent-adolescent communication includes listening non-defensively, providing information in a clear manner, and establishing effective consequences (Rodriguez, Nichols, Javdani, Emerson, & Donenberg, 2015). Furthermore, positive communication between parents and adolescents is inversely related to adolescents engaging in risky behaviors (e.g., substance use and unprotected sex; Blake et al., 2001; DiClemente et al., 2001).

Parent-adolescent conflict peaks during the transition into middle school (Allison & Schutz, 2004), especially for individuals with an ADHD diagnosis (Markel & Wiener, 2014). The conflictual interactions may also stem from arguments surrounding academic outcomes, since ADHD adolescents may have low or failing test grades and may fail to complete academic work and prepare adequately for tests (Power et al., 2006). Furthermore, family conflict with ADHD adolescents often centers around the teen's failure to accept responsibility and perform routine tasks (Johnston & Mash, 2001). These adolescents commonly lack general problem-solving, time management, and self-regulation skills that allow for age appropriate independence

from parents (Johnston & Mash, 2001; Evans et al., 2009; Raggi & Chronis, 2006). Parents of ADHD adolescents often adapt an emotional style of parenting, with the use of ultimatums, that can result in coercive interactions, further increasing conflict and strains within the family (Deault, 2010; Modesto-Lowe, Chaplin, Godsay & Soovajian, 2014; Robin, 1990).

A significant marker of adolescent independence is the decrease in time spent with family members and greater time with peers (Johnston & Mash, 2001; Rubin et al., 2008). As a result, adolescents have more unsupervised time and opportunities for poor decision making, resulting in the emergence of problem behaviors (Biederman et al., 2006). For example, substance experimentation and abuse are more likely to occur during unsupervised time, especially in ADHD adolescents, who may have greater impulsivity, as well as co-occurring conduct disorder (Biederman et al., 2006; Frick, Barry, & Kamphaus, 2010). Youth with ADHD are, consequently, less likely to finish high school and college than their typically developing peers (Barkley, Fischer et al., 2006), and tend to carry impairment into college (Biederman et al., 2006).

Studies examining the impact of parent-adolescent communication demonstrate mixed findings. For example, Eadeh et al., (2017) found that parent-adolescent conflict may increase as a response to academic failure or unacceptable classroom behavior. This appears to be especially true of parents with adolescents with ADHD (Eadeh, Bourchtein, Langberg, Eddy, Oddo, Molitor, & Evans, 2017). However, Shearin (2002) investigated how parent-adolescent interactions influence academic performance in males ages 13-17. Adolescents who perceived their interactions with parents as more positive had higher GPAs than adolescents with more negatively perceived parental interactions (Shearin, 2002). Based on these studies, it is important

to understand if communication demonstrates a moderating effect on the relationship between symptoms and academic performance in adolescents with ADHD.

Parental Involvement & Academic Performance

Within the literature, parental involvement has been conceptualized and measured in various ways. Fischel & Ramirez (2005) define parental involvement in terms of a range of parental activities that support their adolescent's learning process. In particular, this definition emphasizes the aspects of involvement related to engagement. In contrast, Wennerholm, Juslin, & Bremberg, 2005, define parental involvement as the experience parents possess, or extent of influence they exert, at their adolescent's school. Overall, parental involvement is a multidimensional construct (Epstein, 1991), broadly referring to the participation of parents in the educational process and experiences of their adolescent (Jeynes, 2005).

As children enter into the middle and high school years, the need for support with learning shifts. There are also changes that occur in parental involvement during this period, including reduced help with their adolescent's academic tasks and decreased communication with teachers (Green, Walker, Hoover-Dempsey, & Sandler, 2007; Seginer, 2006). In order for the adolescent to develop proper cognitive and problem-solving skills, in addition to decision-making skills, it is necessary for these changes in parental involvement to occur (Falbo, Lein, & Amador, 2011). The form of parental involvement shifts throughout development to affirm the adolescent's need for autonomy (Hill & Tyson, 2009; Kim & Hill, 2015; Park & Holloway, 2013), and may include the advancement of learning strategies, discussion of the adolescent's future, and communication of expectations (Green et al., 2007; Park & Holloway, 2013; Spera, 2005).

The influence of family variables on adolescent performance is well documented (Fan & Chen, 2001; Shumow & Lomax, 2002; Jeynes, 2007). For example, adolescents of two-parent families are more likely to graduate from high school, as these teens tend to perform better on standardized tests and earn higher grades (Roscigno, 2000). Additionally, adolescents whose parents demonstrate greater involvement in their education at both home and school show greater academic outcomes than less involved parents (Gutman & Midgley, 2000; Woolley & Grogan-Kaylor, 2006). Increased parental involvement is not only associated with higher levels of academic motivation and achievement (Fan & Williams, 2010; Gonzalez-DeHass et al., 2005; Jeynes, 2005; Wilder, 2014). As such, it is clear that parental engagement in adolescents' academic experiences is pivotal to student success and warrants further exploration in a clinical population of adolescents with ADHD (Eadeh, Bouchtein, Langberg, Eddy, Oddo, Molitor, & Evans, 2017).

Parental Involvement in Students with ADHD

A limited number of studies have examined parental involvement for individuals with ADHD in an academic context. Rogers, Wiener, Marton, & Tannock (2009), for example, investigated parental involvement, as well as whether controlling vs. supporting parenting styles were associated with academic outcomes for 8- to 12- year-olds with ADHD. Parents of children with ADHD reported parenting skills similar to parents of children without the disorder; however, caregivers of ADHD youth reported having less time and energy, lower self-efficacy for academic help, and greater demands from teachers (Rogers et al., 2009). Additionally, a *controlling* parenting style, resulting from parental stress and symptoms of child inattention, negatively influenced academic achievement in children with ADHD (Rogers et al., 2009).

Although the amount and type of parental involvement changes as children transition into adolescence, the influence of parental involvement on the relationship between adolescent ADHD symptomatology and academic performance, has received minimal attention. A qualitative study conducted by Wiener & Daniels (2016) found that adolescents with ADHD reported that parental involvement diminished across their schooling. Adolescents with ADHD also reported differences in how they perceived involvement with regards to the gender of their parent (Green et al., 2007; Park & Holloway, 2013; Wiener & Daniels, 2016). Mothers were perceived as having less involvement in their homework compared to earlier in their schooling, but continued advocacy within the school. In addition, ADHD adolescents perceived fathers as contributing greater pressure to achieve at a higher level, but less overall involvement (Wiener and Daniels, 2016).

Musabelliu, Wiener, & Rogers (2018) focused on the role of parental involvement in how adolescents (ages 13-18), with and without ADHD, engage in the learning process. Similar to the broader literature, caregivers of ADHD adolescents reported lower self-efficacy in their capacity to help their children. Additionally, mothers of teens with ADHD reported fewer aspirations regarding the future of their adolescent compared to mothers of typically developing adolescents. Although this study examined parental involvement in the learning process of youth with and without ADHD, questions remain regarding the potential moderating effects of parental involvement on the relationship between symptom severity and academic performance in this clinical population. Additionally, studies often rely on parent report, negating adolescent report of perceived parental involvement, which may offer unique insights.

School Engagement

School engagement is a construct that is emerging as a determinant of student academic success (Zendarski, Sciberras, Mensah, & Hiscock, 2017). School engagement is multifaceted and conceptualized as the way in which students participate in, and identify with, school experiences and the learning process (Zendarski, Sciberras, Mensah, & Hiscock, 2017). This construct encompasses a minimal of three dimensions: behavioral, emotional, and cognitive engagement (Fredricks, Blumenfeld, & Paris, 2004; Hanewald, 2013). Cognitive engagement includes the willingness and motivation to learn (Fredricks, Blumenfeld, & Paris, 2004; Hanewald, 2013). Emotional aspects encompass the feelings the student has towards school, their sense of belonging, and participation in daily school life (Fredricks, Blumenfeld, & Paris, 2004; Hanewald, 2013). Finally, behavioral aspects of engagement include a student's effort and persistence in a given task (Wolters, 2004). Each aspect of engagement has been shown to contribute to an adolescent's overall academic achievement (Fredricks et al., 2004; Wang & Eccles, 2012).

Low academic engagement during high school is related to a host of problems, including an increased likelihood of poor long-term academic and occupational outcomes (Abbott-Chapman et al., 2014; Archambault, Janosz, Morizot, & Pagani, 2009; Burns, Collin, Blanchard, De-Freitas, & Lloyd, 2008). There are specific factors that correlate with lower engagement, which include family and school-level factors, gender (i.e., male), and lower socio-economic status (Farooq et al., 2011). To the contrary, students with a stronger emotional and behavioral connection to school tend to have greater academic success and are less likely to leave school when they are expected to be in attendance (Henry et al., 2012). In a population of urban adolescents, Dotterer & Wehrspann (2016) found that parental involvement contributed to

academic achievement and competence, and positively associated with behavioral and cognitive engagement (Day & Dotterer, 2018; Dotterer & Wehrspann, 2016). Although behavioral and emotional aspects of engagement positively associate with academic outcomes, these dimensions of school engagement often decline in early adolescence (Niehaus, Rudasill, & Rakes, 2012; Wang & Eccles, 2012).

The core symptoms of ADHD, including inattention and executive functioning deficits (Barry et al., 2002; Frazier, Demaree, & Youngstrom, 2004; Massetti et al., 2008), have been shown to affect learning and the ability to demonstrate appropriate behaviors in the classroom (Barkley, 2006; Volkow et al., 2011). ADHD symptoms further contribute to the development of ineffective academic skills, increase the risk of becoming disengaged from school, and often lead to lower achievement and self-esteem (Zendarski, Sciberras, Mensah, & Hiscock, 2017). In relation to their non-ADHD peers, ADHD youth rate themselves as having lower levels of student engagement and being less motivated towards school (Major, 2018).

In contrast, Zendarski et al. (2017) found that third year high school students with ADHD reported greater school connectedness and similar levels of motivation as their same-aged peers. Two longitudinal studies examined how academic achievement is influenced by the individual's attendance, truancy, and disciplinary problems in adolescents with ADHD (Kent et al., 2011; Molina et al., 2009). These studies provided additional support that behavioral engagement is important in understanding academic achievement for students with ADHD. However, there is significantly less understanding about the influence of school engagement on the relationship between symptom severity and academic performance in adolescents with ADHD.

The Present Study

Research has documented the relationship between ADHD symptom severity and poor academic outcomes (DuPaul & Langberg, 2015; Wolraich et al., 2005). However, few studies have focused on identifying moderating variables that may influence or change the relationship between symptom severity and academic outcomes in adolescents with ADHD (Van der Oord, Daley, Maric, Prins, & Ollendick, 2015). The current study seeks to address these limitations, further exploring moderators of academic performance in a clinical sample of adolescents with ADHD. Specifically, the present study examined adolescent reports of routines, parent-adolescent conflict, perceptions of parental involvement, and school engagement, on the relationship between ADHD symptom severity and academic performance (GPA).

In sum, the present study seeks to answer the hypotheses listed below:

1. Based on the association between ADHD symptom severity and academic performance (DuPaul & Langberg, 2015), it is hypothesized that there will be a significant, negative relationship between ADHD symptom severity and academic GPA. Specifically, increased ADHD symptoms will be indicative of a lower GPA.
2. It is hypothesized that routines, school engagement, and parental involvement will be positively correlated with GPA. Conversely, parent-adolescent conflict will be negatively correlated with adolescent GPA.
3. There will be significant main effect between predictor variables (e.g., routines, parent-adolescent conflict, parental involvement, and school engagement) on the relationship between adolescent ADHD symptom severity and GPA. Higher levels of routines, parental involvement, and school engagement will predict higher GPAs. In contrast, higher parent-adolescent conflict will predict lower adolescent GPA.

4. Finally, the interaction between symptom severity and significant main effects will be examined in relation to ADHD symptom severity and academic performance. It is hypothesized that the presence of routines, parent-adolescent conflict, parental involvement, and student engagement will interact with symptoms of inattention to moderate academic GPA in the adolescent sample.

STUDY 1: ROUTINES AND CONFLICT

Methods

Participants

The sample consisted of a total of 140 adolescents between the ages of 11-17 diagnosed with ADHD and their parent/caregiver. The adolescents who participated in this study were required to have a diagnosis of attention-deficit/hyperactivity disorder (ADHD) to meet criteria for the study. Additionally, adolescents had to have caregiver reported clinical elevations (T score of 65 or greater) on either the Inattention or Hyperactive/Impulsive subscales of the Conners-3 in order to be included in the study. Adolescent participants who had a comorbid diagnosis of autism spectrum disorder (ASD) or intellectual disabilities were excluded from participating in this study. Study 1 participants were collected in two ways (i.e. in person and online). Of the participants recruited in person, majority were the siblings of undergraduate students who were seeking course credit within the research system of their university, followed by referral from primary care physicians or psychologists (N=87). Of the sample collected in person, which included 87 parent-adolescent dyads, seven participants were excluded because of incomplete data (over 10%).

The remainder of participants were recruited by self-referral in response to online advertisements. Parent and adolescent participants completed separate online questionnaire surveys. This online sampling initially generated 85 parent/caregiver responses and 75 adolescent responses. Of those sampled, 60 caregiver-adolescent dyads were confirmed for inclusion based on their completion and meeting required study criterion (e.g., consent/assent, clinical diagnosis of ADHD). There were no statistically significant differences between the population collected in person versus online. As such, participant data was combined for a total

of 140 caregiver-adolescent dyads that were included in analysis for Study 1. The demographic characteristics of the 140 caregiver-adolescent participants can be found in Tables 1 and 2.

Table 1. Demographic characteristics of parent participants for Study 1

	Total Sample <i>N = 140</i>	
	Frequency/Mean	Percentage/(SD)
Age (years)		
Mean	46.85	(5.14)
Race/Ethnicity		
White	127	90.7%
Hispanic/Latino	6	4.3%
African American/Black	3	2.1%
Asian	2	1.4%
Unknown	2	1.4%
Education Level		
Some High School	3	2.1%
High School Graduate/GED	5	3.6%
Some College	41	29.3%
Standard College Graduate	64	45.7%
Post-College Advanced Degree	27	19.3%
Household Annual Income		
< \$15,000	2	1.4%
\$15,000-\$24,999	2	1.4%
\$25,000-\$34,999	5	3.6%
\$35,000-\$49,999	10	7.1%
\$50,000-\$74,999	18	12.9%
\$75,000-\$99,999	18	12.9%
\$100,000+	84	60.0%
Unknown	1	0.7%
Marital Status		
Married	115	82.1%
Divorced	11	7.9%
Separated	1	0.7%
Single	5	3.6%
Widowed	3	2.1%
Unknown	5	3.6%
Relation to Adolescent		
Mother	135	96.4%
Father	4	2.3%
Grandmother (Legal Guardian)	1	0.7%
Number of Adults in Home		
Mean	2.10	(0.59)

As seen in Table 1, the caregiver's mean age was 46.85 ($SD=5.13$) and ranged from ages 31 to 82. The majority of participants identified as white (90.7%), followed by Hispanic/Latino

Table 2. Demographic characteristics of adolescent participants for Study 1

	Total Sample $N = 140$	
	Frequency/Mean	Percentage/(SD)
Age in years		
Mean	14.45	(2.06)
Grade level in school		
Mean	9.11	(2.08)
Gender		
Male	77	55.0%
Female	63	45.0%
Race/Ethnicity		
White	118	84.3%
Hispanic/Latino	11	7.9%
Mixed Race	5	3.6%
African American/Black	2	1.4%
Asian	1	0.7%
Native American	1	0.7%
Unknown	2	1.4%
Average GPA	2.97	(0.81)
Math	2.83	(1.12)
Science	3.00	(0.88)
English	3.09	(0.97)
ADHD Medication		
Yes	103	73.6%
No	37	26.4%

(4.3%), African American/Black (2.1%), and Asian (1.4%). Caregiver's education level included standard college graduate (45.7%), some college (29.3%), post-college advanced degree (19.3%), high school graduate/GED (3.6%), and some high school (2.1%). Participants' mean household annual income ranged from < \$15,000 (1.4%) to \$100,000+ (60.0%) and the majority of caregivers were married (82.1%). This sample was under representative of the general population on the characteristics of race/ethnicity, education level, and household annual income, and was not reflective of the larger US Southeast region.

Table 2 provides demographic information of the adolescent participants for Study 1. Adolescents were between the ages of 11 to 17 and the mean age was 14.45 ($SD=2.06$). The majority of adolescents identified as male (77%) and were racially and ethnically similar to their caregivers. The adolescent respondents had an overall grade point average of 2.97 ($SD=0.81$), with a reported grade point average of 2.83 for math ($SD=1.12$), 3.09 for English ($SD=0.97$), and 3.00 for science ($SD=0.88$). During the time of data collection, 73.6% of the participating adolescents were prescribed medication for their ADHD symptoms.

Procedure

Following Institutional Review Board approval (IRB #4275), adolescents and their caregivers were recruited and informed on the study's purpose. Diagnoses of ADHD were made by clinicians, or other mental health professionals, prior to the time of data collection. Participants were required to provide a psychological or evaluative report, or other form confirming documentation of an ADHD diagnosis prior to completion of questionnaires.

Upon obtaining caregiver consent and adolescent assent, participants completed their separate questionnaires. Specifically, caregivers were provided with questionnaires containing the demographic questionnaire, a request for adolescent grades (e.g., last official report card), and the Conners-3 Parent Short Form. Adolescent participants completed the Conners-3 Self-Report, Adolescent Routines Questionnaire (ARQ), and the Conflict Behavior Questionnaire (CBQ). Questionnaire completion took approximately 20 minutes. As compensation for their time and effort, participants had the ability to enter into a raffle for the chance to win a prize (e.g., gift card or t-shirt).

Measures

Caregiver Questionnaires

Demographics Questionnaire. The parent of the participating adolescent was asked to complete a demographics questionnaire. The demographic variables for this study included parent's age, self-identified race/ethnicity, annual household income, marital status, employment status, occupation, years of education, gender, and number of other adults living in the home. The parent was also asked to report information about the participating adolescent and their grades in core subjects. See Appendix B.

Conners 3rd Edition Short Form: (*Conners 3: Parent; Conners, 1997*). The Conners 3-Parent Short includes a total of 45 items with five major factors: Learning Problems, Hyperactivity/Impulsivity, Executive Functioning, Aggression, and Peer Relations. The Conners 3-Parent Short was used in this study to measure the severity of adolescent symptoms and served as a secondary means to verify the adolescent's ADHD diagnosis.

Adolescent Questionnaires

Conners 3rd Edition Short Form: (*Conners 3: Self-Report; Conners, 1997*). The Conners 3-Self-Report is similarly derived from the Conners' Rating Scales, and consists of 41 items with 5 subscales: Inattention, Hyperactivity/Impulsivity, Learning Problems, Aggression, and Family Relations. Informants rate items on a scale from 0 (Never or Seldom) to 3 (Very True or Very Frequently). The Conners 3-Self-Report has adequate internal consistency (.85 and above), good inter-rater reliability, and acceptable test-retest reliability. The Conners 3-Self-Report was used as a measure of adolescent symptom severity, as well as a secondary way to verify the diagnosis of ADHD.

Adolescent Routines Questionnaire: Self-Report (ARQ: SR; Piscitello, Cummins, & Kelley, & Meyer, 2019). The AQR:SR is a measure of various routines that adolescents engage in that provides insight as to how frequently their behaviors occur from 0 (“Never”) to 4 (“Nearly Always”). Adolescents are asked to rate each item of this questionnaire based on their behaviors in the last month. Examples items include, “I leave for school on time” and “I complete chores regularly.” The ARQ:SR consists of 20-items with a four-factor solution and has demonstrated good internal consistency. For the purposes of the current study, the ARQ was used as a measure of overall routines during analyses and the coefficient alpha was .86.

Conflict Behavior Questionnaire Short Form. (CBQ-20; Prinz, Foster, Kent & O’Leary, 1979; Robin & Foster, 1989). Derived from a 75-item long form with high internal consistency, the CBQ includes information regarding dyadic interactions, as well as other’s behaviors (Prinz et al., 1979). The CBQ has 20-items that measure conflict and communication styles experienced within the family context. Participants are asked to answer items as either “true” or “false,” and a higher score is indicative of higher conflict. The CBQ-20 produces a single score and was correlated at .95 with scores from the longer version.

Results

Descriptive Statistics

This study used SPSS, Version 26 to examine descriptive statistics. Table 3 provides the possible ranges of study variables completed by the adolescent, as well as means and standard deviations for Study 1. Academic performance was calculated by averaging parent-reported grades for math, science, and English. Possible reported grades ranged from A-F (including +/-), which were converted to a numerical, weighted GPA (4.30-0.0). The participant’s raw scores were used in the analyses for the variables measuring total ADHD and inattention symptoms,

routines, and conflict communication. Included in Table 3 are the possible ranges of variables, where higher scores indicate a higher degree of the continuous variable.

Table 3. Descriptive statistics of adolescent variables for Study 1

Variable	Mean	SD	Possible Range
1. ADHD Symptoms	27.45	8.49	0-48
2. Inattention Symptoms	12.36	3.80	0-18
3. ARQ	50.00	12.77	0-80
4. CBQ	6.04	5.48	0-20
5. GPA	2.97	0.81	0.0-4.3

Table 3 presents the combined dataset of adolescent-report variables for Study 1. The mean GPA was 2.97 ($SD=0.81$). Total ADHD symptoms had a mean score of 27.45 ($SD=8.49$), while inattention symptoms, a subset of total ADHD symptoms, had a mean score of 12.36 ($SD=3.80$). Adolescent routines was above the 50% possible range with a mean of 50.00 ($SD=12.77$) and their scores of conflict with caregivers produced a mean score of 6.05 ($SD=5.48$). This represents poor communication among adolescent participants and their caregivers.

Correlational Analyses

Correlational analyses were conducted to examine the relationship between all of the study variables. The results of the correlational analysis for Study 1 are displayed in Table 4. Age and gender were not significantly correlated with adolescent GPA for the dataset. However, age and gender were correlated with total ADHD and inattention symptoms (Table 4).

As seen in Table 4, GPA was significantly correlated with total ADHD symptoms ($r = -.240, p < .01$), routines ($r = .380, p < .01$), and conflict ($r = -.323, p < .01$). Results indicate that adolescent GPA decreased with higher levels of ADHD symptoms and with more parent-adolescent conflict. The opposite relationship was true for routines, as more routines correlated positively with GPA. Routines were negatively correlated with total ADHD symptoms ($r = -.301, p < 0.01$) and inattention symptoms ($r = -.318, p < 0.01$). This indicates that increased total

ADHD symptoms and inattention were associated with decreased routines. Adolescent-reported total ADHD symptoms and inattention was positively correlated with total conflict ($r = .309$, $p < .01$; $r = .220$, $p < .01$, respectively). As such, higher levels of total ADHD and inattention symptoms associate with higher level of conflict communication between caregivers and their adolescents.

Table 4. Bivariate correlations between adolescent-reported predictor variables for Study 1

Variable	1	2	3	4	5	6	7
1. Age	-	-.005	-.138	.185*	.183*	-.124	.233**
2. Gender	-	-	-.035	-.154	-.208*	.158	.016
3. GPA	-	-	-	-.240**	-.166	.380**	-.323**
4. ADHD	-	-	-	-	.817**	-.301**	.309**
5. INATTN	-	-	-	-	-	-.318**	.220**
6. ARQ	-	-	-	-	-	-	-.393**
7. CBQ	-	-	-	-	-	-	-

Note. ** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed); ADHD = Total ADHD Symptoms; INATTN = Inattention Symptoms; ARQ = Routines; CBQ = Conflict Communication

Regression Analyses

Hierarchical regression analyses were conducted for the Study 1 dataset to assess whether routines and conflict communication predicted adolescent GPA. Variance Inflation Factor (VIF) and tolerance levels were examined for all predictor variables. The predictor and moderator variables were centered before conducting analyses to minimize multicollinearity (Aiken & West, 1991).

At Step 1 of each regression model, age, gender, and ADHD symptoms (total or inattention) were added, since these variables have been shown to be significantly correlated with adolescent GPA (DuPaul & Langberg, 2015; Wolraich et al., 2005). At Step 2, routines and conflict were entered as predictor variables since they have been linked to academic outcomes in youth in the broader literature (Roche & Ghazarian, 2012; Shearin, 2002). On the final step of the regression models, interaction variables were computed by multiplying the centered predictor

variables and then entered at this step to examine any possible moderating interactions between variables. Results of the analyses for Study 1 are presented in Tables 5 & 6.

The results for the hierarchical regression analysis of Study 1 that included total ADHD symptoms as a predictor are displayed in Table 5. As presented in Table 5, the model examined adolescent-reported predictors of GPA and was significant at Step 1, $F(3,134) = 3.20, p = .025, R^2 = .07, p = .025$. At Step 1, total ADHD symptoms emerged as a significant predictor of GPA ($\beta = -.23, p = .025$). However, neither gender nor age were related to adolescent GPA ($p > .05$). At Step 2, routines and conflict communication were entered to be examined as potential predictors. Step 2 was significant, $F(5, 132) = 6.73, p < .001, R^2 = .20, p < .001$, and accounted for

Table 5. Hierarchical regression of adolescent report of total ADHD symptoms and GPA

	Step One		Step Two		Step Three	
	β	Sig	β	Sig	β	Sig
Age	-.089	.295	-.035	.662	-.032	.691
Gender	-.073	.392	-.098	.220	-.093	.248
ADHD	-.226	.009	-.097	.257	-.100	.246
ARQ Total	-	-	.306	.001	.306	.001
CBQ Total	-	-	-.163	.069	-.150	.101
ADHDxRoutines	-	-	-	-	.040	.658
ADHDxConflict	-	-	-	-	-.025	.785
R^2	.067	.025	.203	.000	.206	.787

Note. ADHDxRoutines= Interaction with ARQ Total; ADHDxConflict= Interaction with CBQ Total.

17% of the variance in GPA. The change in R^2 between Step 1 and Step 2 was also significant, $F(2,132) = 11.29, p < .001$. Total routines ($\beta = .306, p = .001$) was a significant predictor of adolescent GPA in Step 2. At Step 3, interaction terms were entered in the regression. The interactions were not significant in predicting adolescent GPA ($\beta = -.03$ and $.04, p > .05$) and the change in R^2 was not statistically significant.

Table 6 presents the hierarchical regression including adolescent report of total inattention symptoms as a predictor of GPA for Study 1. The second regression analysis further

examined predictors of adolescent GPA. Step 1 of the model was not significant, $F(3,134) = 1.89, p = .14, R^2 = .04, p = .14$. At Step 2, the model was significant, $F(5,132) = 6.43, p < .001, R^2 = .20, p < .001$, and accounted for 17% of the variance. The change in R^2 between Step 1 and Step 2 was also significant, $F(2,132) = 12.76, p < .001$. Specifically, routines ($\beta = .32, p = .001$) and conflict ($\beta = -.18, p = .04$) were significant predictors of GPA at Step 2. The interactions

Table 6. Hierarchical regression for adolescent report of inattention symptoms and GPA

Variable	Step One		Step Two		Step Three	
	β	Sig	β	Sig	β	Sig
Age	-.103	.232	-.043	.600	-.042	.606
Gender	-.071	.414	-.091	.259	-.090	.266
INATTN	-.154	.082	-.028	.745	-.029	.740
ARQ Total	-	-	.317	.001	.315	.001
CBQ Total	-	-	-.181	.041	-.178	.047
INATTNxRoutines	-	-	-	-	.003	.973
INATTNxConflict	-	-	-	-	-.016	.864
R^2	.041	.135	.196	.000	.196	.976

Note. INATTN = Total Inattention Score; INATTNxRoutines= Interaction with ARQ Total; INATTNxConflict= Interaction with CBQ Total.

between total inattention symptoms and adolescent-reported routines and conflict were examined in Step 3. However, the interactions were not statistically significant ($\beta = -.02$ and $.00, p > .05$) and there was no statistically significant change in R^2 . As seen in Table 6, results suggest that higher levels of adolescent-reported routines were associated with higher GPA. Additionally, increased levels of conflict were associated with lower GPA.

STUDY 2: SCHOOL ENGAGEMENT AND PARENTAL INVOLVEMENT

Methods

Participants

The sample consisted of 60 adolescents between the ages of 11-17 diagnosed with ADHD and their parent/caregiver. Participants were required to provide documentation of a diagnosis of attention-deficit/hyperactivity disorder (ADHD) in order to meet criteria for the study. Additionally, participating teens had to have clinical elevations (T score of 65 or greater) on either the Inattention or Hyperactive/Impulsive scales on the parent report of the Conners-3. Individuals with autism spectrum disorder (ASD) or intellectual disabilities were excluded from participating in this study.

Participants for Study 2 were recruited by self-referral in response to online advertisements. Due to the COVID-19 pandemic, parent and adolescent participants completed separate online questionnaire surveys. This online sampling initially generated 85 parent/caregiver responses and 75 adolescent responses. Of those sampled, 60 caregiver-adolescent dyads were confirmed for inclusion based on their completion and meeting required study criterion (e.g., consent/assent, clinical diagnosis of ADHD). The demographic characteristics of the 60 caregiver-adolescent participants can be found in Tables 7 and 8.

As seen in Table 7, the caregiver's mean age was 47.07 ($SD=7.23$) and ranged from ages 31 to 82. The majority of the respondents identified as white (88.3%), followed by Hispanic/Latino (5.0%), and Asian (3.3%). Caregiver's education level consisted of standard college graduate (33.3%), some college (31.7%), post-college advanced degree (28.3%), some high school (5.0%), and high school graduate/GED (1.7%). Participants' mean household annual income ranged from < \$15,000 (3.3%) to \$100,000+ (56.7%) and the majority of caregivers were

married (80.0%). Similar to Study 1, the sample for Study 2 was under representative of the general population on the characteristics of race/ethnicity, education level, and household annual income, and was not reflective of the larger US Southeast region.

Table 7. Demographic characteristics of parent participants for Study 2

	Total Sample	
	<i>N</i> = 60	
	Frequency/Mean	Percentage/(<i>SD</i>)
Age (years)		
Mean	47.07	(7.23)
Race/Ethnicity		
White	53	88.3%
Hispanic/Latino	3	5.0%
Asian	2	3.3%
Unknown	2	3.3%
Education Level		
Some High School	3	5.0%
High School Graduate/GED	1	1.7%
Some College	19	31.7%
Standard College Graduate	20	33.3%
Post-College Advanced Degree	17	28.3%
Household Annual Income		
< \$25,000-\$34,999	6	10.0%
\$35,000-\$49,999	7	11.7%
\$50,000-\$74,999	8	13.3%
\$75,000-\$99,999	5	8.3%
\$100,000+	34	56.7%
Marital Status		
Married	48	80.0%
Divorced	5	8.3%
Single	4	6.7%
Widowed	1	1.7%
Unknown	2	3.3%
Relation to Adolescent		
Mother	55	91.7%
Father	4	6.7%
Grandmother (Legal Guardian)	1	1.7%
Number of Adults in Home		
Mean	1.98	(0.55)

Table 8 provides demographic information of the adolescent participants for Study 2. Adolescents were between the ages of 11 to 17 and the mean age was 14.97 ($SD=1.86$). The majority of adolescents identified as female (51.7%) and were racially and ethnically similar to their caregivers. Participating adolescents had an overall grade point average of 2.98 ($SD=0.23$), with a reported grade point average of 2.66 for math ($SD=1.17$), 3.11 for English ($SD=1.01$), and 2.91 for science ($SD=0.84$). During the time of data collection, 75.0% of the participating adolescents were prescribed medication for their ADHD symptoms.

Table 8. Demographic characteristics of adolescent participants for Study 2

	Total Sample <i>N</i> = 60	
	Frequency/Mean	Percentage/(<i>SD</i>)
Age in years		
Mean	14.97	(1.86)
Grade level in school		
Mean	9.48	(1.97)
Gender		
Male	29	48.3%
Female	31	51.7%
Race/Ethnicity		
White	45	75.0%
Hispanic/Latino	8	13.3%
Mixed Race	3	5.0%
Asian	1	1.7%
Native American	1	1.7%
Unknown	2	3.3%
Average GPA	2.89	(0.23)
Math	2.66	(1.17)
Science	2.91	(0.84)
English	3.11	(1.01)
ADHD Medication		
Yes	45	75.0%
No	15	25.0%

Procedure

Following Institutional Review Board approval (IRB #4275), adolescents and their caregiver were recruited and informed of the study's purpose. Upon obtaining participant consent and

assent, the adolescent completed a survey containing the Conners 3, Adolescent Routines Questionnaire (ARQ), Conflict Behavior Questionnaire (CBQ), Parental Support for Learning Scale- Adolescent Short Form (PSLS-AS), and Behavioral-Emotional-Cognitive School Engagement Scale (BEC-SES) online via Qualtrics. The participating parent was provided with questionnaires containing the demographic questionnaire and Conners 3. Questionnaires took approximately 20 minutes to complete. As compensation for their time and effort, participants had the chance to enter into a raffle for a gift card.

Participants were required to have a documented diagnosis of ADHD made by clinicians, or other mental health professionals, prior to the time of data collection. Participants provided a psychological, evaluative report, or other documentation of an ADHD diagnosis prior to completion of questionnaires. Clinical elevations (t score of 65 or greater) on caregiver report of either Inattention or Hyperactive/ Impulsive subscales of the Conners-3 were utilized for secondary verification of symptomatology. In addition, the participating parent was required to provide the report card of their adolescent's last academic quarter for further verification of grades.

Measures

Caregivers and adolescents were provided with the same measures presented in Study 1. Specifically, caregivers completed a demographics questionnaire, the Conners-3, and provided reports of the participating adolescent's grades for math, English/ELA, and science (e.g., last official report card). Adolescents similarly completed the Conners-3: Self-Report, Adolescent Routines Questionnaire (ARQ), and Conflict Behavior Questionnaire (CBQ), as well as two additional measures examining adolescent reported school engagement and perceived parental involvement. The additional measures are presented below.

Adolescent Questionnaires

Parental Support for Learning Scale —Adolescent Short Form (*PSLS-AS*; *SR*; Rogers, Hickey, Wiener, Heath, & Noble, 2018). The PSLS-AS was derived from the Parental Support for Learning Scale (PSLS; Rogers et al., 2014), which demonstrated a strong factor structure and psychometric properties. The PSLS-AS is a 22-item questionnaire with a two-factor structure including different kinds of parental involvement: Autonomy Supportive Involvement and Controlling Involvement. This adolescent-reported measure assesses their perception of parental behaviors that are aimed at helping them to be successful in school. Items are rated on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). Additionally, the PSLS-AS has demonstrated good internal reliability and convergent validity. During analyses, the Controlling Involvement scale was used as the measure for parental involvement and the coefficient alpha was .71.

Behavioral-Emotional-Cognitive School Engagement Scale (*BEC-SES*; *Li & Lerner, 2013*). The BEC-SES was developed by Li and Lerner (2013) and includes three domains of school engagement: behavioral, emotional, and cognitive engagement. The domains are measured using five items administered using a 4-point Likert-type scale (where answer options differ across the scales). The Behavioral- Emotional-Cognitive School Engagement Scale (BEC-SES) was used as a measure of adolescent report of overall school engagement. The BEC-SES demonstrated good internal reliability with a coefficient alpha of .76.

Results

Descriptive Statistics

Descriptive statistics are included in Table 9, and present the means, standard deviations, and possible ranges of the adolescent-rated variables for Study 2. Similar to Study 1, academic

performance was calculated by averaging parent-reported grades for math, science, and English. Possible reported grades ranged from A-F (including +/-), which were converted to a numerical weighted GPA (4.30-0.0). The raw scores were also used while analyzing the measures of total ADHD and inattention symptoms, routines, conflict, and parental involvement. School engagement was calculated by averaging the score for each of the 15 items on the questionnaire. Included in Table 9 are possible ranges of variables, where higher scores are representative of a higher degree of the continuous variable.

Table 9. Descriptive statistics of adolescent variables for Study 2

Variable	Mean	SD	Possible Range
1. ADHD Symptoms	28.71	8.97	0-48
2. Inattention Symptoms	13.07	3.68	0-18
3. ARQ Total	45.14	11.36	0-80
4. CBQ Total	7.45	5.66	0-20
5. Student Engagement	1.86	0.53	0-3
6. Parental Involvement	29.63	9.29	0-55
7. GPA	2.89	0.77	0.0-4.3

Table 9 presents descriptive statistics for adolescent-reported variables for Study 2. The mean adolescent GPA for Study 2 was 2.89 ($SD=0.77$). Adolescents reported levels of total ADHD ($M=28.71$, $SD=8.97$) and inattention ($M=13.07$, $SD=3.68$) symptoms that were similar to those in Study 1. The mean score of adolescent-reported routine was 45.14 ($SD=11.36$). Self-report scores of conflict communication with their caregivers generated a mean score of 7.45 ($SD=5.66$) for the adolescent sample. Additionally, self-reported student engagement ($M=1.86$, $SD=0.53$) and perceived parental involvement ($M=29.63$, $SD=9.29$) are provided in Table 4.

Correlational Analyses

To assess the relationship among all variables, correlational analyses were conducted. The results of the bivariate correlational analysis of Study 2 are displayed in Table 10. Age and

gender were not significantly correlated with adolescent GPA; however, age and gender were correlated with total ADHD and inattention symptoms (Tables 10).

As seen in Table 10, adolescent GPA in Study 2 was correlated with total ADHD symptoms ($r = -.344, p < .01$) and routines ($r = .484, p < .01$); however, conflict ($r = -.185, p > .05$) was not significantly correlated. Additionally, inattention was negatively correlated with GPA ($r = -.271, p < 0.05$), indicating lower GPA at higher levels of inattention. High levels of school engagement were correlated with higher GPA ($r = .529, p < 0.01$). Parental involvement was not correlated with GPA, total ADHD symptoms, or inattention symptoms ($r = -.242, r = .125, r = .164$, all $p > 0.05$, respectively). School engagement was negatively correlated with both total ADHD symptoms ($r = -.285, p < 0.05$) and inattention ($r = -.320, p < 0.05$), indicating low levels of school engagement at the highest levels of total ADHD and inattention symptoms.

Table 10. Bivariate correlations between adolescent-reported predictor variables for Study 2

Variable	1	2	3	4	5	6	7	8	9
1. Age	-	-.005	-.111	.257*	.223	-.183	.459**	-.161	.045
2. Gender	-	-	.018	-.190	-.264*	.181	.107	.179	.035
3. GPA	-	-	-	-.344**	-.271*	.487**	-.185	.529**	-.242
4. ADHD	-	-	-	-	.854**	-.296*	.347**	-.285*	.125
5. INATTN	-	-	-	-	-	-.335**	.297*	-.320*	.164
6. ARQ	-	-	-	-	-	-	-.375**	.563**	-.124
7. CBQ	-	-	-	-	-	-	-	-.316*	.152
8. SE	-	-	-	-	-	-	-	-	-.314*
9. PI	-	-	-	-	-	-	-	-	-

Note. ** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed); ADHD = Total ADHD Symptoms; INATTN = Inattention Symptoms; ARQ = Routines; CBQ = Conflict Communication; SE = School Engagement; PI = Parental Involvement

Regression Analyses

In order to examine whether school engagement and perceived parental involvement predicted adolescent GPA, hierarchical regression analyses were conducted. Variance Inflation Factor (VIF) and tolerance levels were assessed for all predictor variables. Predictor and

moderator variables were centered before conducting the analyses in order to minimize multicollinearity (Aiken & West, 1991).

At Step 1 of each regression model, age, gender, and ADHD symptoms (total or inattention) were added, since these variables have been shown to be significantly correlated with adolescent GPA (DuPaul & Langberg, 2015; Wolraich et al., 2005). Total routines and conflict were controlled for at Step 2 during analyses in Study 2, since these variables significantly contribute to adolescent GPA but are not significant moderators (informed by results of Study 1; Roche & Ghazarian, 2012; Shearin, 2002). As such, Step 3 examined main effects of school engagement and parental involvement, since these factors have the potential to affect GPA as evidenced by previous research (Day & Dotterer, 2018; Dotterer & Wehrspann, 2016; Rogers et al., 2009). Interaction terms for these variables were created and entered on Step 4 of the regression models to further examine moderating effects. Results of all analyses are presented in Tables 11 & 12.

Table 11 presents the hierarchical regression analysis for Study 2 examining school engagement, parental involvement, and total ADHD symptoms as predictors of adolescent GPA. In Step 1 of the regression model, inattention was not a significant predictor of GPA, $F(3,55) = 2.39, p = .08, R^2 = .12, p = .08$; however, total ADHD symptoms was significant at this step ($\beta = -.33, p = 0.02$). Step 2 of the analysis was significant, $F(5,53) = 4.40, p = .002, R^2 = .29, p = .003$, and the model accounted for 23% of the variance. The change in R^2 between Step 1 and Step 2 was significant, $F(2,53) = 6.68, p = .003$, and routines was the only significant predictor ($\beta = .47, p = .001$) at Step 2. At Step 3, the overall model was significant, $F(7,51) = 4.96, p < .001, R^2 = .41, p = .013$, and accounted for 32% of the variance. The change in R^2 for Step 3 was significant, $F(2,51) = 4.78, p = .01$, and both routines ($\beta = .29, p = .04$) and school engagement (β

= .36, $p = .01$) were significant predictors at Step 3. For step 4, the overall model was significant $F(9,49) = 4.64, p < .001, R^2 = .46, p = .093$, but the change in R^2 was not significant between Step 3 and Step 4, $F(2,49) = 2.49, p = 0.09$. However, the interaction between total ADHD symptoms and school engagement emerged as a significant predictor ($\beta = .27, p = .04$) of adolescent GPA. Figure 1 presents the significant interaction between total ADHD symptoms and school engagement in predicting adolescent GPA. The interaction between total ADHD symptoms and parental involvement was not statistically significant ($p > .05$).

Table 11. Hierarchical regression for adolescent report of total ADHD symptoms and GPA

Variable	Step One		Step Two		Step Three		Step Four	
	β	Sig	β	Sig	β	Sig	β	Sig
Age	-.039	.769	-.021	.875	-.031	.805	-.020	.869
Gender	-.064	.623	-.138	.264	-.169	.151	-.168	.150
ADHD	-.333	.016	-.242	.066	-.197	.113	-.168	.186
ARQ	-	-	.466	.001	.287	.041	.373	.011
CBQ	-	-	.081	.579	.132	.341	.114	.398
SE	-	-	-	-	.361	.012	.178	.286
PI	-	-	-	-	-.102	.380	-.167	.154
ADHDxSE	-	-	-	-	-	-	.270	.043
ADHDxPI	-	-	-	-	-	-	.135	.263
R^2	.115	.079	.294	.003	.405	.013	.460	.093

Note. ADHD = Total ADHD Symptoms; ARQ = Routines; CBQ = Conflict Communication; SE = School Engagement; PI = Parental Involvement; ADHDxSE = Interaction with SE; ADHDxPI = Interaction with PI

The predicted GPA values for Figure 1 were generated with the predict function in R (v 4.0.0 R Core Team 2020). The predict function in R works by plugging in possible values of the model independent variables (e.g., Total ADHD, Age, Gender, etc....) and calculating the dependent variable (e.g., GPA). The three fitted lines in Figure 1 represent the relationship of the interaction between school engagement and total ADHD symptoms from the model in Step 4 of the hierarchical regression, which included all of the variables listed in Table 11 (Model Equation: $GPA = -0.2*Age + -.168*Gender + -.168*ADHD + .373*ARQ + .114*CBQ + .178*SE + -.167*PI + .270*ADHDxSE + .135*ADHDxPI + 3.197$). GPA estimates were

calculated from all observed values of total ADHD symptoms at high (1), average (mean, 0), and low (-1) levels of school engagement. The value for the interaction between ADHD and school engagement (ADHDxSE) was generated by multiplying the value for total ADHD and the school

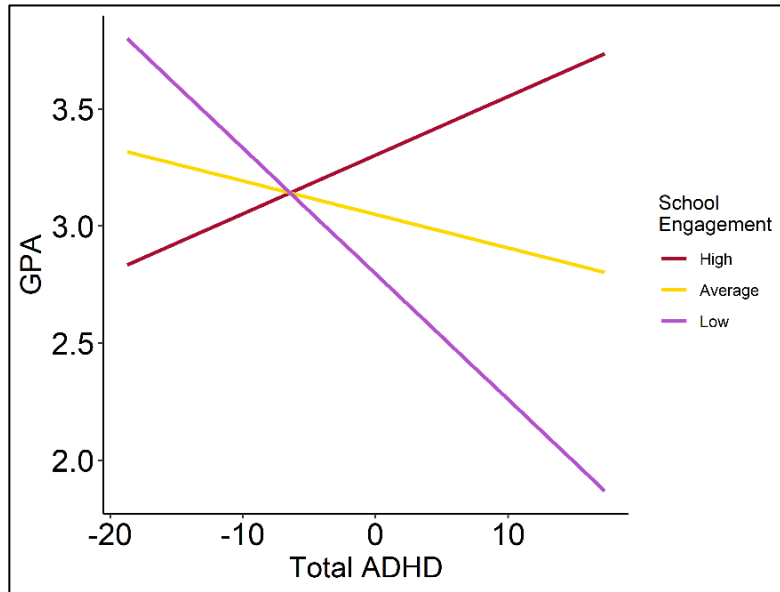


Figure 1. Total ADHD and school engagement as predictors for adolescent GPA

engagement value, while all other variables in the model were held constant at the median observed value for that variable in the dataset.

Table 12 presents the hierarchical regression model examining school engagement and parental involvement as moderators of inattention symptoms for predicting GPA. In Step 1 of the regression, inattention was not a significant predictor of GPA, $F(3,55) = 1.52, p = .22, R^2 = .08, p = .22$. Step 2 of the analysis was significant, $F(5,53) = 3.76, p = .005, R^2 = .26, p = .003$, and the model accounted for 19% of the variance. The change in R^2 between Step 1 and Step 2 was significant, $F(2,53) = 6.66, p = .003$, and routines was the only significant predictor ($\beta = .47, p = .001$) at Step 2. At Step 3, the overall model was significant, $F(7,51) = 4.46, p = .005, R^2 = .38, p = .003$, and accounted for 29% of the variance. The change in R^2 for Step 3 was significant, $F(2,51) = 4.8, p = .01$, and both routines ($\beta = .29, p = .04$) and school engagement ($\beta = .37, p =$

.01) were significant predictors at Step 3. For step 4 the overall model was significant $F(9,49)=4.35, p < .001, R^2 = .44, p = .07$, but the change in R^2 was not significant between Step 3 and

Table 12. Hierarchical regression for adolescent report of inattention symptoms and GPA

Variable	Step One		Step Two		Step Three		Step Four	
	β	Sig	β	Sig	β	Sig	β	Sig
Age	-.068	.612	-.035	.796	-.045	.724	-.056	.649
Gender	-.074	.584	-.130	.312	-.155	.201	-.184	.125
INATTN	-.263	.061	-.140	.297	-.080	.527	-.118	.390
ARQ	-	-	.474	.001	.294	.042	.392	.009
CBQ	-	-	.045	.761	.097	.488	.095	.483
SE	-	-	-	-	.372	.012	.241	.120
PI	-	-	-	-	-.105	.374	-.145	.214
INATTNxSE	-	-	-	-	-	-	.281	.027
INATTNxPI	-	-	-	-	-	-	.097	.440
R^2	.077	.219	.262	.003	.380	.012	.444	.067

Note. INATTN = Inattention Symptoms; ARQ = Routines; CBQ = Conflict Communication; SE = School Engagement; PI = Parental Involvement; INATTNxSE = Interaction with School Engagement; INATTNxPI = Interaction with Parental Involvement

Step 4 $F(2,49)= 2.85, p = 0.07$. However, the interaction between inattention symptoms and school engagement emerged as a significant predictor ($\beta = .28, p = .03$). Figure 2 presents the significant interaction between adolescent-reported inattention symptoms and school engagement in predicting adolescent GPA. The interaction between total ADHD symptoms and parental involvement was not statistically significant ($p > .05$).

The predicted GPA values for Figure 2 were generated with the predict function in R (v 4.0.0 R Core Team 2020). The three fitted lines in Figure 2 represent the relationship of the interaction between school engagement and inattention symptoms from the model in Step 4 of the hierarchical regression, which included all of the variables listed in Table 12 (Model Equation: $GPA = -.056*Age + -.184*Gender + -.118*INATTN + .392*ARQ + .095*CBQ + .241*SE + -.145*PI + .281*INATTNxSE + .097*INATTNxPI + 3.446$). GPA estimates were calculated from all observed values of inattention symptoms at high (1), average (mean, 0), and

low (-1) levels of school engagement. The value for the interaction between inattention symptoms and school engagement (INATTN \times SE) was generated by multiplying the value for

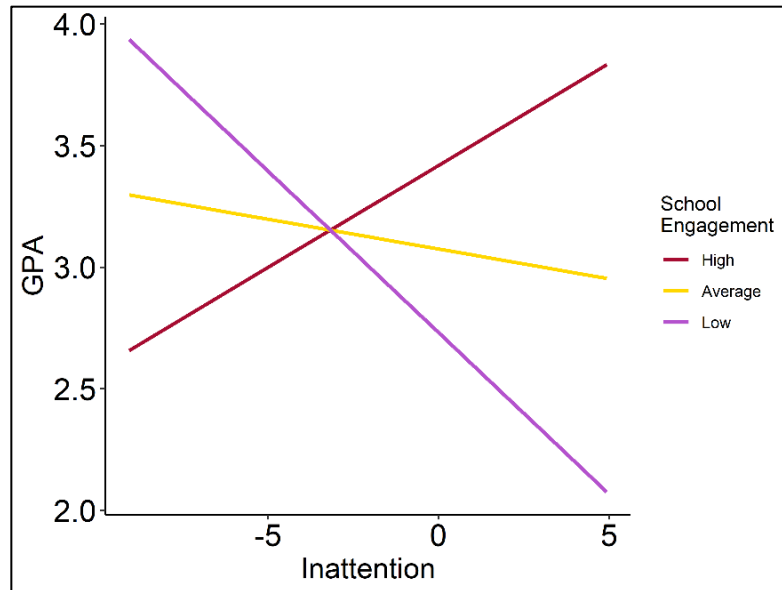


Figure 2. Inattention symptoms and school engagement as predictors for adolescent GPA inattention symptoms and the school engagement value, while all other variables in the model were held constant at the median observed value for that variable in the dataset.

DISCUSSION

Academic functioning is often considered one of the most critically impairing domains for adolescents with ADHD due to increased academic demands and deficits in executive functioning skills (DuPaul & Langberg, 2015; Frazier, Youngstrom, Glutting, & Watkins, 2007; Wolraich et al., 2005). Symptoms of ADHD, particularly inattention symptoms, have been shown to interfere with learning and appropriate behaviors within the classroom (Barkley, 2006; Volkow et al., 2011). Adolescents with increased ADHD symptoms are more likely to encounter academic difficulties and are at an increased academic risk as they progress through the transitional periods of middle and high school (Barkley, 2015; DuPaul & Stoner, 2014; Zendarski, Sciberras, Mensah, & Hiscock, 2017). As such, it is imperative to understand the ways in which certain environmental factors may contribute to overall adjustment and moderate academic performance for adolescents with ADHD.

The present study aimed to expand the literature by further exploring potential moderators of academic performance in a clinical sample of youth with ADHD. Adolescent ratings of routines, parent-adolescent conflict, perceptions of parental involvement, and school engagement were examined as moderators of the relationship between ADHD symptomatology and academic performance (GPA). Initial hypotheses were partially supported. Major findings of the present study support school engagement as a moderator of the relationship between ADHD symptoms (total and inattention) and GPA. Specifically, at the highest levels of inattention and total ADHD symptoms, adolescents demonstrate low levels of academic performance. However, based on the findings from the current study, increasing adolescent school engagement likely increases academic performance, especially at the highest levels of inattention and total ADHD symptoms. Adolescents who report strong school engagement may experience successful

adjustment and academic outcomes, thereby mitigating perceived impairment of their ADHD symptoms.

The moderating effects of school engagement on the relationship between ADHD symptoms and GPA warrants exploration of ways to supplement treatment. Specifically, it may be beneficial to further examine ways to increase school engagement for ADHD youth. One potential way to increase school engagement in a clinical sample of adolescents with ADHD may be through the use of motivational interviewing techniques (Sibley et al., 2016). Additional bolstering of coordinated care efforts between mental health providers and school professionals may further help ADHD youth to increase prosocial supports that are necessary for academic success (Fabiano et al., 2006).

As hypothesized, routines were positively correlated with adolescent GPA. Additionally, there were significant main effects indicating that routines were positively associated with the relationship between ADHD symptoms and GPA. This relationship was expected, as the literature supports that adolescents who establish and adhere to routines generally experience greater academic success than those who do not (Roche & Ghazarian, 2012). However, adolescent-reported routines did not interact with ADHD symptoms to predict adolescent GPA.

The present study provides partial support of the hypothesis that parent-adolescent conflict communication is an important factor that associates with the relationship between adolescent ADHD symptoms and GPA. Findings indicate that parent-adolescent conflict was negatively correlated with GPA and main effects support that more conflict is negatively associated GPA. These findings are consistent with the broader literature, which documents family conflict as associating with adjustment problems in an adolescent population (Grych, Jouriles, Swank, McDonald, & Norwood, 2000; Schlomer et al., 2015). Although significantly

related to GPA, parent-adolescent conflict was not supported as a moderator of the relationship between ADHD symptoms and adolescent GPA.

Within the literature, greater parental involvement in an adolescent's education at both home and school is associated with greater academic outcomes when compared to less involved parents (Gutman & Midgley, 2000; Woolley & Grogan-Kaylor, 2006), and is associated with higher academic achievement (Jeynes, 2005; Wilder, 2014). This study revealed no relationship between parental involvement and adolescent GPA in a sample of youth with ADHD. However, the measure used for parental involvement was specific to *controlling* involvement. As such, the benefits of parental involvement for adolescents with ADHD may be specific to autonomous parental support opposed to having caregivers that are more controlling of their academic environment (Hill & Tyson, 2009; Kim & Hill, 2015; Park & Holloway, 2013).

Limitations

Results of the current study should be considered with the acknowledgment of several limitations. Although the literature supports the relationship between inattention symptoms and poor academic outcomes, one limitation of the study was the weak correlation of adolescent reported inattention symptoms with GPA. Previous literature supports that adolescents with ADHD are prone to underreporting their own ADHD symptoms and overestimating how well they are functioning (Barkley, Fischer, Smallish, et al., 2002; Hoza, Gerdes, Hinshaw, et al., 2004; Owens, Goldfine, Evangelista, et al., 2007). In addition, majority of the participating parents reported that their adolescent was prescribed ADHD medication at the time of the study. As such, it is possible that adolescent reporting of inattention symptoms was influenced by the use of medication, as well as potential underreporting of symptom presentation.

Although there were no statistically significant differences between the participants that were combined during the analysis for Study 1, the majority of participants were collected prior to the COVID-19 pandemic. It is important to acknowledge that the nature of the pandemic and state stay-at-home orders drastically shifted systematic and family routines during the middle of data collection, which likely changed daily task demands (e.g., academic responsibilities) and stressors placed on the adolescent, as well as the family. Due to the global pandemic, the population recruited for Study 2 was smaller in size, which decreased power while exploring school engagement and parental involvement as potential moderators on the relationship between ADHD symptoms and GPA. Because of the low power from a small sample size, loading multiple factors in the same block might not allow for the ability to detect significant changes in variance between the subsequent steps of the hierarchical regression models (Cohen, 2013). In addition, there were limited ethnically and racially diverse participants in this study, and the samples included an overrepresentation of families with higher levels of socioeconomic status. As such, findings should be replicated with a larger sample size that is more heterogeneous and reflective of the general population.

Another limitation of the current study was the inability to control for academic rigor when calculating adolescent GPA, which has been shown to be an important predictor of later academic success (e.g., college; Adelman, 2006). Though grades were collected, and an overall GPA was calculated for each participant, it is difficult to account for the academic discrepancies across various school settings. Additionally, GPA calculations did not account for if the student was enrolled in advance placement courses or receiving special education services, as well as the level of services the student may have been receiving.

Implications and Future Directions

Predictor variables used in this study were derived from adolescent self-report. Due to the possibility of underreported ADHD symptoms, further analyses with the use of both the caregiver and adolescent ratings may be beneficial in order to explore moderators of the relationship between ADHD symptoms and academic outcomes. Additionally, the statistical analyses used for both studies were conducted based on the proposed analyses. However, the literature also supports a relationship between conduct problems and poorer academic outcomes for adolescents with ADHD (Barbot, Crossman, Hunter, Grigorenko, & Luthar, 2014; Hastings, Daley, Burns, & Beck, 2006; Zendarski, Sciberras, Mensah, & Hiscock, 2017). Future studies should consider factors that may contribute to impairment and difficulty with overall adjustment for teens with ADHD, such as increased conduct problems.

Several of the predictor variables analyzed in Studies 1 and 2 used an overall score (e.g., routines and school engagement). However, future research should also consider examining specific subscales of these predictors. For example, overall scores of adolescent reported routines demonstrated significant main effects in the present study. Further examination of specific routines, such as time management, may be beneficial in learning more about which aspects of routines are most influential on the relationship between ADHD symptoms and GPA in an adolescent population.

The present study supported the interaction of school engagement with ADHD symptoms as a significant predictor of GPA. Since an overall score of school engagement was utilized in the present study, examination of specific subtypes of school engagement may also be warranted (e.g., Behavioral, Emotional, or Cognitive scales) to further inform treatment for these individuals. Specifically, the Behavior subscale of the BEC-SES includes some items that may

map onto diagnostic criteria of ADHD (e.g., incomplete homework). However, items on the Emotional and Cognitive subscales appear to tap into the student's concept of belongingness and motivation to apply themselves in the school setting. Therefore, it may be important to consider these specific scales in a clinical setting to guide the course of treatment (e.g., motivational interviewing in combination with academic interventions).

Summary

The present study investigated potential predictors that may influence the relationship between ADHD symptoms and academic outcomes in adolescents. Findings examine the contribution of various factors (e.g., routines, parent-adolescent conflict, school engagement, and parental involvement) of adolescent informants as it relates to ADHD symptoms and the relationship with academic outcomes. Routines and school engagement were found to be positively related to GPA, while total ADHD symptoms, inattention, and parental-adolescent conflict were negatively related to GPA. Additionally, school engagement emerged as a moderator on the relationship between ADHD symptoms (total and inattention) and adolescent GPA. The present study may serve to inform assessment and guide treatment with regard to ADHD symptoms and academic outcomes.

APPENDIX A: CONSENT FORM

1. **Study Title:** Moderators of Academic Performance and Symptom Severity in Adolescents with Attention-Deficit/Hyperactivity Disorder
2. **Data Collection:** Data for this study will be collected through referrals from primary care physicians, psychologists, or self-referral to advertisements as well as from LSU students.
3. **Investigators:** If you have any questions about the study you can reach the investigators, M-F, 8:00 a.m.-4:30 p.m.: Mary Lou Kelley, Ph.D. at (225) 578-4113; Ryan N. Cummins, Graduate Student at (225) 578-6731.
4. **Purpose of the Study:** The purpose of the study is to look at how routines, parent-teen interactions, and school engagement may impact the relationship between a teenager's ADHD symptoms and their academic performance.
5. **Who is involved?** 130+ teenagers (ages 11-17) and their parent.
6. **What is involved?** Teens and their parent will be asked if they would like to participate in the study. Once they have both agreed and signed consent and assent forms, they will be asked to answer some questions about themselves, their family, and daily routines. Researchers will help anyone who has difficulty reading the forms.
7. **Benefits:** There is no direct benefit to you for taking part in this study. However, the results of the study may help professionals to provide better health care services to teenagers with ADHD and their families.
8. **Risks:** There are no known risks to taking part in this study. Should you feel discomfort at any time during the study, researchers can provide community health care resources to you.
9. **Participation is Voluntary:** This study is not required. If you choose to take part in this study, you have the right to refuse any question or stop participation at any time.
10. **Privacy:** All information that you provide is for research only and will be kept private and anonymous. Your name will not go on any of the research data and only trained research staff will have access to your information. Your name will only go on the consent form, which will be stored separately from your data. When the study is finished, a report will be written about the results and your name will not be used in any way.
11. **Cost:** There is no cost for taking part in this study.
12. **Right to Refuse:** You may refuse to take part in or withdraw from the study at any time. If you decide to leave the study, it will not impact your treatment by your clinician, or standings with LSU at the present time or in the future.

This study has been explained to me and all my questions have been answered. If I have additional questions, I will contact the study investigators. If I have questions about my rights as a research participant or any other concerns, I can contact Dennis Landin, Institutional Review Board, (225) 578-8692, irb@lsu.edu, www.lsu.edu/irb.

I agree to participate in the study described above and acknowledge the researchers' obligation to provide me with a copy of this consent form.

Signature of Participant

Date

The study participant has informed me that he/she is unable to read. I certify that I have read this consent form to the participant and explained that by completing the signature line above, the participant has agreed to participate.

Signature of Reader

Date

APPENDIX B: DEMOGRAPHIC QUESTIONNAIRE

ID: _____

Date: _____

Relation to Child (ex. Biological, Step-mother, etc.): _____

Age: _____ Occupation: _____ Race/Ethnicity: _____

Marital Status: _____

Education Level: Please select the *highest* level of education that YOU have completed.

- ☐ Less than Junior High School
- ☐ Junior High School (6th, 7th, 8th grade)
- ☐ Some High School (9th, 10th, 11th, 12th grade)/Did Not Graduate
- ☐ High School Graduate/GED
- ☐ Some College (at least 1 year) or specialized training
- ☐ Standard College Graduate (B.A., B.S.)
- ☐ Post-College Advanced Degree (Masters or Doctorate)

Household Income: Please select the CURRENT total annual income of your household (income of all people in the home, including government assistance).

- ☐ Below \$5,000
- ☐ \$5,000-14,999
- ☐ \$15,000-24,999
- ☐ \$25,000-34,999
- ☐ \$35,000-49,999
- ☐ \$50,000-74,999
- ☐ \$75,000-99,999
- ☐ \$100,000 and up

Relationship status with spouse? (please circle one) *Excellent* *Good* *Fair* *Poor*

How many adults live in the home? _____

How many children exhibit behavioral problems? _____

Instructions: Please complete the following information regarding your adolescent.

Age: _____ Grade Level: _____ Race/Ethnicity: _____ Sex: _____

Current Grade Average for *each* subject (Ex. A+, A, A-, B+, B, B-, C+, C, C-, D+, D, D-, F):

Math: _____ English: _____ Science: _____ Social Studies: _____

Has your child had any previous psychological treatment? _____ **If so, when?** _____

Diagnoses? _____

Current Medications: _____

APPENDIX C: ASSENT FORM

I, _____, agree to be in a study to find ways to help teenagers with ADHD to better adjust at home and school. I will be filling out questionnaires with information about myself as well as my family, daily routine, and involvement with school. I can decide not to answer any questions in the study or stop being in the study at any time without getting in trouble.

Adolescent's Signature: _____ Age: _____ Date: _____

Witness* _____ Date: _____

* (Witness must be present for the entire assent process, not just the signature by the minor)

APPENDIX D: ADOLESCENT ROUTINES QUESTIONNAIRE: SELF-REPORT

Routines are events that occur regularly: at about the same time, in the same order, or in the same way every time. **Please rate how often you engage in each routine by circling a number ranging from 0 (never) to 4 (nearly always) of how often you engaged in this routine based on your behavior during the last month.** If an item does not apply to you, please mark "N/A".

I...	How often does it occur at about the same time or in the same way ?					
	0 = Never 1 = Rarely 2 = Sometimes 3 = Often 4 = Nearly Always N/A= Not Applicable					
1. Wake up on time	0	1	2	3	4	N/A
2. Exercise daily	0	1	2	3	4	N/A
3. Organizes my things for the next day	0	1	2	3	4	N/A
4. Use deodorant	0	1	2	3	4	N/A
5. Attend after school activities (e.g., clubs/organizations)	0	1	2	3	4	N/A
6. Complete homework in the same place and time	0	1	2	3	4	N/A
7. Shower/bathe daily	0	1	2	3	4	N/A
8. Go to bed at the same time	0	1	2	3	4	N/A
9. Eat dinner with family at dinner table	0	1	2	3	4	N/A
10. Complete chores regularly	0	1	2	3	4	N/A
11. Talk with family about his/her day	0	1	2	3	4	N/A
12. Participate in extracurricular activities (e.g., sports, volunteer work)	0	1	2	3	4	N/A
13. Spend time with friends on the weekend	0	1	2	3	4	N/A
14. Tell my parents before I leave home for school or other activities	0	1	2	3	4	N/A
15. Brushes/fixes my hair daily	0	1	2	3	4	N/A
16. Ask for permission before going somewhere	0	1	2	3	4	N/A
17. Brush my teeth daily	0	1	2	3	4	N/A
18. Spend time with friends after school	0	1	2	3	4	N/A
19. Get ready for bed on time	0	1	2	3	4	N/A
20. Get dressed on time	0	1	2	3	4	N/A

APPENDIX E: BEHAVIORAL-EMOTIONAL-COGNITIVE SCHOOL ENGAGEMENT SCALE



The Behavioral-Emotional-Cognitive School Engagement Scale (BEC-SES)

Item	Response Format
<i>Behavioral School Engagement</i> (mean of 5 items)	
How often do you come to class unprepared (homework unfinished, forget to bring books or other materials, etc.)?*	0=Never, 1=Sometimes, 2=Often, 3=Always
How often do you complete homework on time?	
How often do you skip classes without permission?*	
How often do you actively take part in group (class) discussions?	
How often do you work hard to do well in school?	
<i>Emotional School Engagement</i> (mean of 5 items)	
I feel part of my school	0=Strongly disagree, 1=Disagree, 2=Agree, 3=Strongly agree
I care about the school I go to	
I am happy to be at my school	
I don't find school fun and exciting*	
I enjoy the classes I am taking	
<i>Cognitive School Engagement</i> (mean of 5 items)	
I want to learn as much as I can at school	0=Strongly disagree, 1=Disagree, 2=Agree, 3=Strongly agree
I think it is important to make good grades	
I think the things I learn at school are useful	
I think a lot about how to do well in school	
School is very important for later success	
<i>Overall School Engagement:</i> mean of all above 15 items	

Note: Items with * should be reverse-coded.

APPENDIX F: PARENTAL SUPPORT FOR LEARNING: ADOLESCENT FORM

PARENTAL SUPPORT FOR LEARNING (PSL): ADOLESCENT FORM - MODIFIED

Rogers & Wiener (2011)

INSTRUCTIONS: This form is about how you and your parents deal with school-related issues, like homework, grades, and other school activities. Use the scale below to answer each question about **YOUR MOTHER** (left side) and **YOUR FATHER** (right side). Think about each sentence and circle the number that corresponds with your answer. Please try to answer all the questions.

MOTHER						FATHER				
Strongly Disagree	Disagree	I'm not sure	Agree	Strongly Agree		Strongly Disagree	Disagree	I'm not sure	Agree	Strongly Agree
1	2	3	4	5	If my grades are not good enough, this parent will restrict my free time or take away my usual privileges.	1	2	3	4	5
1	2	3	4	5	This parent supports me in the things I do in school.	1	2	3	4	5
1	2	3	4	5	This parent tries to tell me how to approach my schoolwork.	1	2	3	4	5
1	2	3	4	5	This parent insists I do my schoolwork her / his way.	1	2	3	4	5
1	2	3	4	5	This parent is typically happy to talk to me about my learning.	1	2	3	4	5
1	2	3	4	5	This parent thinks I am lazy when it comes to school.	1	2	3	4	5
1	2	3	4	5	When I am struggling at school, this parent listens to my opinion or perspective.	1	2	3	4	5
1	2	3	4	5	This parent likes me to come to him/her for help with schoolwork.	1	2	3	4	5
1	2	3	4	5	This parent allows me to make my own decisions regarding my schoolwork.	1	2	3	4	5
1	2	3	4	5	When I get a poor grade, I feel the need to hide it from this parent.	1	2	3	4	5
1	2	3	4	5	This parent punishes me if I do poorly in school.	1	2	3	4	5
1	2	3	4	5	This parent tries to make me feel confident in my schoolwork.	1	2	3	4	5
1	2	3	4	5	Sometimes I feel like this parent is trying to "take over" my schoolwork.	1	2	3	4	5
1	2	3	4	5	This parent seems to be disappointed in my schoolwork a lot.	1	2	3	4	5
1	2	3	4	5	This parent is constantly nagging me about my schoolwork.	1	2	3	4	5
1	2	3	4	5	This parent tries to make me feel guilty when I do poorly in school.	1	2	3	4	5
1	2	3	4	5	Whenever possible, this parent allows me to make my own choices about my schoolwork and learning.	1	2	3	4	5
1	2	3	4	5	I feel a lot of pressure from this parent to achieve at school.	1	2	3	4	5
1	2	3	4	5	This parent supports me in my school-related choices.	1	2	3	4	5
1	2	3	4	5	This parent is often disapproving of my schoolwork.	1	2	3	4	5
1	2	3	4	5	This parent is very strict when it comes to my schoolwork.	1	2	3	4	5
1	2	3	4	5	This parent is very patient when it comes to my education.	1	2	3	4	5

APPENDIX G: IRB APPROVAL

ACTION ON PROTOCOL APPROVAL REQUEST



Institutional Review Board
Dr. Dennis Landin, Chair
130 David Boyd Hall
Baton Rouge, LA 70803
P: 225.578.8692
F: 225.578.5983
irb@lsu.edu
lsu.edu/research

TO: Mary Lou Kelly
Psychology

FROM: Dennis Landin
Kinesiology

DATE: September 5, 2019

RE: IRB# 4275

TITLE: Moderators of academic performance and symptom severity in adolescents with attention-deficit/hyperactivity disorder

New Protocol/Modification/Continuation: New Protocol

Review type: Full ☐ Expedited ☒ **Review date:** 9/5/2019

Risk Factor: Minimal ☒ Uncertain ☐ Greater Than Minimal ☐

Approved ☒ **Disapproved** ☐

Approval Date: 9/5/2019 **Approval Expiration Date:** 9/4/2020

Re-review frequency: (annual unless otherwise stated)

Number of subjects approved: 150

LSU Proposal Number (if applicable):

By: Dennis Landin, Chairman

A handwritten signature in cursive script, appearing to read "D. Landin", is written over a horizontal line.

PRINCIPAL INVESTIGATOR: PLEASE READ THE FOLLOWING –

Continuing approval is **CONDITIONAL** on:

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects*
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants, including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.
7. Notification of the IRB of a serious compliance failure.
8. **SPECIAL NOTE: When emailing more than one recipient, make sure you use bcc.**

**All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents in print in this office or on our World Wide Web site at <http://www.lsu.edu/irb>*

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VITA

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