

NEGATIVE PARENTING IN CHILDHOOD DIFFERENTIALLY AFFECTS THE  
ADJUSTMENT OF COLLEGE STUDENTS WITH AND WITHOUT ADHD

A Thesis  
by  
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Submitted to the Graduate School  
at Appalachian State University  
in partial fulfillment of the requirements for the degree of  
MASTER OF ARTS

May 2014  
Department of Psychology

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## **Abstract**

### **NEGATIVE PARENTING IN CHILDHOOD DIFFERENTIALLY AFFECTS THE ADJUSTMENT OF COLLEGE STUDENTS WITH AND WITHOUT ADHD**

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Parenting a child who has Attention Deficit/Hyperactivity Disorder (ADHD) brings extraordinary challenges due to the disruptive behaviors which commonly occur with this disorder. A parent's competence and perceived self-efficacy in rearing a child with ADHD may have long-term repercussions on the child's functioning, such as the severity and chronicity of ADHD symptoms beyond adolescence. Online surveys were sent to undergraduate participants and collateral informants (i.e., parents) to collect information on ADHD status, impairment, and parenting style. The purpose was to determine if there was a relationship between emerging adults' ADHD status and how they were reared. Students did not differ in their report of negative parenting styles across ADHD status and parents of students in the ADHD group reported higher satisfaction and efficacy. Across the entire sample, negative parenting styles were associated with ADHD traits (e.g., existing diagnosis, symptoms that meet diagnostic standards) and impaired functioning. Negative parenting style had a larger detrimental impact on ADHD-related symptoms, impairment, and comorbid symptoms for those in the ADHD group compared to those in the control group.

*Keywords:* ADHD, parenting, adult, family

## **Acknowledgements**

I would like to thank my mentor and thesis chair, Dr. Will Canu, for his support, guidance, and enthusiasm through the thesis process and throughout my graduate training. Additionally, I am grateful for my thesis committee, Dr. Kurt Michael and Dr. Joshua Broman-Fulks. I would like to acknowledge the Cratis D. Williams Graduate School and the Wiley F. Smith Endowment for providing funding in support of this study. Additional support was provided via grants from the Appalachian State University Research Council and the Psi Chi International Honor Society in Psychology, awarded to Dr. Canu and Dr. Cynthia Hartung of the University of Wyoming, who also deserves thanks. Finally, acknowledgement is due to Dr. Elizabeth Lefler, of the University of Northern Iowa, who led the collection of data for this study at that institution.

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## **Foreword**

This thesis is written in accordance with the style of the *Publication Manual of the American Psychological Association (6<sup>th</sup> Edition)* as required by the Department of Psychology at Appalachian State University.

## **Negative Parenting in Childhood Differentially Affects the Adjustment of College Students With and Without ADHD**

Attention-deficit/hyperactivity disorder (ADHD) is a developmental disorder that primarily manifests with core symptoms of excessive inattention (IA; e.g., inability to follow complex directions), hyperactivity (e.g., leaving seat when inappropriate), impulsivity (e.g., interrupting others and blurting out answers during school), and emotional lability (Sobanski et al., 2010). To be diagnosed with ADHD, such symptoms must have been present before the age of twelve and not be better accounted for by another mental disorder (American Psychiatric Association, APA, 2013). The minimal symptomatic threshold for ADHD (predominantly inattentive or hyperactive presentation) is currently at least six IA symptoms or six HI symptoms, accompanied by impairment in at least two life domains. In individuals 17 and older, at least five IA or HI symptoms must be present and interfere in two or more settings (APA, 2013). Those who meet diagnostic criteria for both IA and HI are diagnosed with ADHD Combined presentation, whereas those with clinically elevated symptoms in but one or the other symptom cluster are designated ADHD Predominantly Inattentive or Hyperactive/Impulsive presentation, respectively (APA, 2013). Current estimates of the total prevalence of ADHD in children ranges from approximately five to nine percent in the United States (Barkley, Murphy, & Fischer, 2008; Centers for Disease Control and Prevention, CDC, 2011).

The prevalence of ADHD in adults has been examined across the world, with estimates ranging from 1.1% in South Korea (Park et al., 2011) to 2.3% in Hungary (Bitter,

Simon, Balint, Meszaros, & Czobor 2010), 3.6% in Germany (de Zwaan et al., 2012), 5% in the Netherlands, 7.3 % in France (de Graaf et al., 2008), and anywhere from around 4 to 7% in the United States (de Graaf et al., 2008; Kessler et al., 2006; Murphy & Barkley, 1996). The frequency of ADHD symptoms persisting into adulthood has been reported to be as high as 78% (Biederman, Petty, Evans, Small, & Faraone, 2010), with some modestly lower estimates (e.g., 66%; Barkley et al., 2008) and others suggesting rates closer to 40% (Biederman, Mick, & Farone, 2000; Kessler et al., 2005). Although there is little agreement of what portion of those with childhood ADHD continue to meet full criteria as an adult, there is strong evidence the disorder continues to affect many individuals into adulthood, often causing impairment across several domains.

Impairment related to ADHD tends to occur across domains in affected young adults' lives, including education, employment, domestic responsibilities, social activities, dating and marriage, and even driving (Barkley et al., 2008). For instance, those with persistent ADHD report having substantial behavior problems at school, being placed in special education classes, and being retained in a grade at least one time (Barkley, et al., 2008). The same symptoms that hinder individuals' ability to be successful in elementary through secondary school settings (e.g., disorganization, poor judgment, failure to plan ahead, drifting attention) impact emerging adults at work and in higher education, particularly when it comes to successfully meeting deadlines, planning ahead, and managing their finances (Wasserstein, 2005). Further, a significantly higher percentage of affected adults experience being disciplined by a supervisor, being fired, interpersonal issues with co-workers, and overall lower work performance when compared to other clinical groups and non-diagnosed

peers (Barkely et al., 2008). Finally, comorbid disorders remain more the rule than the exception for adults with ADHD; common comorbidities include Major Depressive Disorder, anxiety disorders, Conduct Disorder (CD), Oppositional Defiant Disorder (ODD), and substance use disorders (Cumyn, French, & Hechtman, 2009; Nylander, Holmqvist, Gustafson, & Gillberg, 2009).

### **Etiology of ADHD and Parent-Child Relational Impairment**

**Biological Factors.** ADHD is a disorder that is neurological in nature and which many assert develops mostly due to genetic influences (Barkley et al., 2008; Brookes et al., 2006; Greven, Rijdsdijk, & Plomin, 2011). While a recent study puts the heritability estimate for ADHD at approximately .8 (Waldman & Gizer, 2006), there is scarce support for specific genetic variations being responsible for a large amount of the variance in ADHD status in the population. In a meta-analytic review, Gizer, Ficks, and Waldman (2009) examined the presence of various genes that affect neurotransmitters in children with ADHD. Generally, the dopamine transporter genes, DAT1, DRD4, DRD2, and DRD5, were most consistently linked with ADHD. However, even among these, strong support for ADHD causality is somewhat lacking. For instance, teacher- and parent-reports of hyperactive/impulsive and inattentive symptoms have been shown to be associated with DAT1, whereas only symptoms of IA were linked to DRD4 (Gizer et al., 2008). Genes affecting norepinephrine and serotonin pathways have also been implicated in affecting the expression of ADHD. Specifically, the ADRA2A noradrenergic receptor gene has been associated with symptoms of IA and HI, with its presence acting as a moderator of symptom status in children with ADHD (Waldman & Gizer, 2006). Overall, evidence is perhaps strongest for the DRD4 gene

to be involved in the manifestation of ADHD; this gene is located on chromosome 11 and appears to play a role in executive functions (EF; e.g., planning, judgment, organization, response inhibition; Gizer et al., 2008; Martel et al., 2011), which have generally been shown to be deficient in individuals with ADHD (Halperin, Trampush, Miller, Marks, & Newcorn, 2008).

The combination of genetic vulnerability and parenting style may affect the expression of ADHD. Children with an increased genetic risk for ADHD show more inattentive and hyperactive/impulsive symptoms when their parents use inconsistent discipline (Martel et al., 2011). Boys with the Monoamine Oxidase A genotype and expressing related high activity levels display increased symptoms of ADHD when their parents use negative parenting strategies. In contrast, boys with this same genotype who are parented using less hostile and punitive approaches have fewer symptoms of ADHD (Li & Lee, 2012). For young children (~ 5 years old) with ADHD and the 9-repeat allele of the DAT1 gene, negative parenting predicts more CD symptoms five to eight years later. Conversely, maternal reports of positive parenting predicted fewer conduct problems in this same group (Lahey et al., 2011).

**Parenting Styles.** For many parents of children with ADHD, the combination of stress related to parenting an affected child and stress related to one's own personal ADHD symptoms and associated impairment is likely to foster a chaotic home environment, which may predispose parents to "negative" parenting styles (Harvey, Danforth, McKee, Ulaszek, & Friedman, 2003; Mokrova, O'Brien, Calkin, & Keane, 2010). Parenting styles generally fall along a continuum between the two anchors of being lax and overly punitive, with

extremes in either direction defined as negative. To wit, three terms are used to represent the common overarching parenting types: permissive, authoritarian, and authoritative (Baumrind, 1966; Buri, 1991). *Permissive* parenting can be characterized as not exerting enough control over a child's behavior. The child is overinvolved in decisions regarding rules and behavior, and the parent provides little structure in the child's life (Baumrind, 1966). Often, these parents do not supervise their children closely, missing out on opportunities to teach the child how to regulate his or her own behaviors and emotions (Healey, Flory, Miller, & Halperin, 2011). On the opposite end of the spectrum, the *authoritarian* parent applies too much control over the child, applying strict rules and expectations and using intrusive behavior to influence the child. Little autonomy is given, as non-adherence to the rules brings punishment, often of a severe nature (i.e., corporal punishment; Baumrind, 1966). The authoritarian parent is characteristically negative in interactions, and tends to be quick to show frustration with the child (Maniadaki, Sonuga-Barke, Kakouros, & Karaba, 2005). While many rules are made and enforced, discipline can still be inconsistently applied in this parenting style. Finally, authoritarian parents show little empathy for their children, and conflicts tend not to be resolved effectively (Psychogiou, Daley, Thompson, & Sonuga-Barke, 2008).

In contrast, parents with an authoritative style achieve a balance between fostering independence in the child and using discipline. The parent explains reasons for rules, while exhibiting empathy for the child's related upset (Baumrind, 1966). Positive parenting tactics (e.g., positive reinforcement) are used to encourage the child to use appropriate behaviors and regulate emotions when interacting with peers and authority figures. Clear and

consistent expectations are communicated to the child, with positive reinforcement being the most common tactic to assist the child in learning and complying with the parent's expectations (Thompson et al., 2009).

Negative parenting styles can have detrimental effects on children's functioning. Parents with symptoms of ADHD may either overreact to their child's expression of negative emotion or minimize their child's distress (Mokrova, et al., 2010). Subsequently, children tend to engage in more oppositional behavior (Johnston, Hommersen, & Seipp, 2009), more frequently express anger, and are more impatient and restless (Whalen, Odgers, Reed, & Henker, 2011). Boys with high levels of aggression paired with maternal negativity and disapproval are generally less able to regulate their emotions than their unaffected peers (Melnick & Hinshaw, 2000). Further, children with ADHD experience greater EF deficits in the presence of negligible limit-setting and poor family organization and cohesion (Schroeder & Kelley, 2009). On the other hand, positive parenting may act as a buffer to children's emotion regulation difficulties and other externalizing problem behaviors, especially when their ADHD severity is mild to moderately impairing (Eisenberg et al., 2005; Healey et al., 2011).

**Parent-child Relationship.** Given that parents of children with ADHD use significantly more negative parenting styles, it is to be expected that interactions with the child will be tumultuous. Increased levels of conflict occur between mothers and their children with ADHD (Modesto-Lowe, Danforth, & Brooks, 2008). Mothers with ADHD report feeling distressed concurrent to their child's displays of anger, impatience, and restlessness (Whalen et al., 2011). Children's problems inhibiting aggressive behaviors,

organizing, planning, and using working memory (i.e., EF), and adaptively regulating their emotions are all characteristics that may directly detract from the quality of the parent-child relationship (Graziano, McNamara, Geffken, & Reid, 2011). On the positive side, higher cooperation and enthusiasm and parent-child synchrony tends to predict better functioning for children with ADHD across multiple settings (Healey, Gopin, Grossman, Campbell, & Halperin, 2010). Additionally, parental warmth and positive expressivity tends to increase the quality of the parent-child-with-ADHD relationship (Eisenberg et al., 2005).

Interestingly, Psychogiou et al. (2008) found mothers used more positive parenting with their child with ADHD when they themselves had ADHD. This supports the similarity-fit hypothesis, which posits positive interactions occur when both parent and child have ADHD because the parent has increased empathy for displays of misbehavior; however, it has also been found that parents who endorse more symptoms of ADHD generally report using more negative parenting strategies (Mokrova et al., 2010, and see above). Specifically, mothers with ADHD are more likely to exhibit inconsistent discipline and to be less responsive to their children (i.e., permissive style), which seems related to IA, largely (Chronis-Tuscano et al., 2008; Harvey et al., 2003). Alternatively, mothers symptomatic of ADHD repeat commands more often before giving their children a chance to complete the task (i.e., authoritarian style), as compared to mothers without symptoms of ADHD. This failure to inhibit controlling behaviors may relate specifically to impulsive symptomatology, and fosters less autonomy in their children (Chronis-Tuscano et al., 2011). Accordingly, children are more apt to have lower self-esteem, mimic their parents' aggressive behaviors,



not have the opportunity to learn how to cope successfully with problems, and encounter higher levels of conflict with their parents.

**Parenting Stress.** Families that include at least one child with ADHD tend to share certain characteristics, some of which may be related to the continued (or even initial) manifestation of ADHD symptoms in their affected offspring. Parents of children with ADHD report higher levels of stress and decreased ability to cope with problem behaviors compared to parents of children without ADHD (Cunningham, 2007). Mothers of preschoolers (Healy et al., 2011) and elementary school-age children (Won-Oak & Kendall, 2009) with elevated symptoms of HI and/or IA experience increased distress compared to mothers of children exhibiting age appropriate behavior.

Specific problem behaviors that are amplified in children with ADHD contribute to parental angst. Mothers tend to report (in real time) higher levels of stress in a naturalistic setting (i.e., home) when their child displays high levels of anger, impatience, and restlessness (Whalen et al., 2011). Parents find children's emotional lability and deficits in EF abilities just as stressful as their aggressive behaviors. Perhaps understandably, children with severe hyperactive and impulsive symptoms, as compared to those with solely inattentive symptoms, may induce higher levels of parenting stress (Graziano et al., 2011).

**Parent Self-efficacy and Confidence.** Further exacerbating the likelihood of negative parenting, mothers of children with ADHD report low levels of self-efficacy in attempting to manage difficult behaviors shown by their children. Specifically, mothers report guilt and shame in not being capable of helping their child with ADHD regulate his or her behavior (Peters & Jackson, 2009). Low levels of confidence have been expressed by

single mothers (Chacko et al., 2008), those who have been primed by reading vignettes describing a boy with ADHD (Maniadaki et al., 2005), and by mothers who report ADHD symptoms themselves (Ninowski, Mash, & Benzies, 2007). Due to the heritable nature of ADHD, parents of children with the disorder are more likely to exhibit symptoms of IA and/or hyperactivity or have the disorder themselves, which may further detract from their global self-confidence and esteem (Canu & Carlson, 2007).

Women with symptoms of ADHD who are pregnant with their first child have significantly more negative expectations about their infant-to-be, and also feel less self-efficacious about their parenting abilities (Ninowski et al., 2007). In a study measuring the impact of maternal ADHD symptoms on the social functioning of their children and on parenting efficacy, lower social competence among mothers was found to be associated with having a child with ADHD. Because children learn how to interact with others, perceive social cues, and regulate their emotions largely from their care givers, mothers with ADHD-symptoms may, by virtue of their own symptoms *and* low self-perceived parenting competence, fail to teach their children adaptive social behavior (Griggs & Mikami, 2011). To wit, maternal IA and HI symptomatology increases the risk that children will display problems interacting with their peers. For instance, during group play simulation, mothers with higher levels of IA gave their children less “corrective feedback” (e.g., directing her child to make specific behavior changes) when their children displayed overtly inappropriate behavior in social interactions (e.g., taking a peer’s toy without asking). Altogether, the body of evidence supports the following conclusion: Mothers with ADHD symptoms will likely

negatively affect the development of their child's social skills regardless if their child has ADHD or not (Griggs & Mikami, 2011).

Low self-efficacy coupled with high levels of stress may lead to lower levels of frustration tolerance and more sensitivity to disruptive behaviors. Increased levels of distress are also associated with increased negative affect, creating a family atmosphere detrimental to the children's development (Woodward, Taylor, & Dowdney, 1998). Additionally, families with children diagnosed with ADHD have significantly higher levels of conflict and less organization in the home. Unfortunately for affected children, structure at home is thought to positively relate to the ability to regulate thought, emotion, and behavior, and to improve social competence (Conlon, Strassle, Vinh, & Trout, 2008). Further research is needed to determine the association between family environment and the maintenance of EF deficits in children with ADHD (Schroeder & Kelley, 2009).

Beliefs about causes of a child's misbehavior also affect parenting self-efficacy, as do beliefs about the quality of the parent-child relationship and even those regarding the efficacy of behavioral parenting training programs' effectiveness, which all in turn can affect children's behaviors. Mothers who attribute their child's misbehavior as stable and internally caused are more likely to utilize both permissive and authoritarian parenting and to suffer increased negative affect (Gerdes & Hoza, 2006). In the face of these environmental factors, children display higher levels of oppositional behaviors, regardless of ADHD status (Johnston et al., 2009). Mothers who show low levels of empathy tend to show higher levels of aggression and hostility toward their child with ADHD (Psychogiou et al., 2008). On the other hand, parents who feel more confident in their parenting abilities and show more

empathy use more positive parenting strategies and are more successful in helping their child show more prosocial behavior (McCleary & Ridley, 1999). Accordingly, specific training and education during planned interventions (e.g., Behavior Parent Training [BPT] programs) can actually help to decrease ADHD symptoms in their children.

**Parent Training Interventions.** Graziano and colleagues (2011) suggest that clinicians should assess for exactly which symptoms are causing parents the most stress during ADHD assessments in order to develop an adequate treatment plan that involves both the child and parents. Several manualized treatments have been developed specifically to teach parents the skills that will aid them in managing their child's ADHD symptoms (Chronis, Chacko, Fabiano, Wymbs, & Pelham, 2004). Common characteristics of BPT interventions include psychoeducation about ADHD, stress management, appropriate discipline techniques (i.e., time-out, loss of privileges), positive reinforcement (i.e., behavior charts, token economy), problem-solving skills, planning and organization, and communication skills (Chacko et al., 2008; McCleary & Ridley, 1999; Motamed, Ghorbanshiroudi, Khalatbari, Maddahi, & Keikhayfarzaneh, 2011; Thompson et al., 2009; Wells et al., 2000).

In their review of evidence for psychosocial treatments for ADHD, Pelham and Fabiano (2008) characterize BPT as "efficacious" in decreasing parental stress and symptoms of ADHD (p. 187). Upon implementing authoritative parenting strategies, children and teenagers show improvement in their daily functioning. For example, after mothers participated in a five session brief BPT emphasizing rewarding and paying attention to the child's positive behavior, while ignoring minor misbehavior, giving clear directions, and

using time-outs effectively, child ADHD symptoms decreased significantly, with parenting practices acting as a significant mediator of child behavior (Chronis-Tuscano et al., 2011).

Another focus of BPT is educating parents—how to become de facto “agents of change”—on how to teach their child to self-monitor and regulate their emotions, leading to improvements that can generalize across time and settings (Thompson et al., 2009, p. 606). Didactic interventions that include strategies for parents to manage their own anger and stress have shown to decrease child ADHD symptoms (Cunningham, 2007; Treacy, Tripp, & Baird, 2005). Modeling appropriate ways to handle distress may aid their child in developing their own coping techniques. Additionally, by setting up clear and predictable expectations for their children, parents increase structure and decrease chaos in the home, which in turn is associated with higher levels of parental warmth and lower levels of anger and hostility. Such improvements tend to reinforce authoritative parenting, creating a positive feedback loop that maintains gains in effectively regulating emotions (Coldwell, Pike, & Dunn, 2006). Further, decreasing parental stress has been shown to increase parents’ confidence in managing their child’s behaviors (McCleary & Ridley, 1999). Increased levels of parenting self-efficacy, especially when implementing new strategies, can lead to more positive and effective parenting, as well (Johnston, Mah, & Regambal, 2010). In summary, positive parenting as taught by BPT interventions can ameliorate the impact of ADHD by decreasing maladaptive parenting behavior, improving the parent-child relationship, and improving child functioning both at home and in the classroom.

ADHD is a psychological disorder that affects children, adolescents, and adults, alike. As summarized above, children with ADHD are plagued with various symptoms that can

affect their daily functioning. Parents of children with ADHD have increased levels of stress and are more likely to employ a punitive and authoritarian parenting style. These parents in turn report lower levels of parenting satisfaction compared to parents of non-diagnosed children. Unexplored, however, is whether specific parenting styles and home environments can be empirically linked to emerging-adulthood outcomes related to ADHD. Accordingly, the purpose of the current study is to determine if there are relationships between young adults' ADHD status (e.g., number of symptoms, level of impairment, comorbidity) and how they were reared (e.g., parenting style of guardian, guardian's self-appraisal of parenting competence).

Based on past findings, it is expected that a significant difference will be found between those with ADHD and those without in how they were raised (i.e., perceived style of parents in childhood). Participants with ADHD will describe their primary caregivers as more punitive (i.e., authoritarian) or permissive compared to those without ADHD. Parents themselves will report a sense of parenting competency and self-esteem that is significantly lower than parents of participants who do not have ADHD. Additionally, participants in both groups will report significantly more impairment in daily functioning if their guardian reports a negative parenting style, and negative parenting style will be positively associated with emerging-adult ADHD symptoms and comorbidity of anxiety, depression, and stress in those affected by the disorder.

## Methods

### Participants

A total of 1,459 students at Appalachian State University ( $n = 922$ ), University of Wyoming ( $n = 431$ ), and University of Northern Iowa ( $n = 106$ ) completed measures for the current study via online data collection. Participants were recruited primarily from the psychology department research pools at the associated institutions, but also via advertisement at service provision offices (e.g., Office of Disability Services, Student Health, Counseling Center) specifically recruiting individuals with prior ADHD diagnoses. All emerging adult (i.e., 18- to 25-year old) students were eligible to participate. Assignment to an ADHD comparison group occurred if the student participant *and* their collateral informant (see below) reported a previous diagnosis of ADHD or six or more childhood IA or HI symptoms, along with a student-reported indication of current or past impairment due to ADHD corresponding to the diagnostic threshold in the DSM-IV-TR (APA, 2000), as data collection occurred prior to the publication of the DSM-5 (APA, 2013). Borderline cases were assessed individually for potential exclusion or inclusion in the ADHD or non-ADHD comparison (NC) groups. These group assignment parameters are in line with previously published research focusing on the college population intended to oversample students meeting research criteria for ADHD (Fedele, Hartung, Canu, & Wilkowski, 2010; Fedele, Lefler, Hartung, & Canu, 2012). Within the overall sample, 290 (20.4% of the total sample) met one of these ADHD inclusion criteria, with 206 reporting a previous ADHD diagnosis (12% of whom were compensated with a \$20.00 payment in lieu of course credit) and 84 endorsing above threshold symptoms and impairment, yielding a total of 290 in the ADHD

group. Of the students in the ADHD group, the majority (75.2%) reported being currently prescribed medication by a medical professional, with 36.9% taking a stimulant, 9% taking an anti-depressant, 1% taking an anti-anxiety medication, and 28.3% taking an unspecified type of medication. In contrast, just a small minority (12.7%) of students in the ADHD group reported currently engaging in psychosocial treatment for ADHD. Within that subsample ( $n = 37$ ), 62.2% endorsed receiving individual cognitive behavioral therapy (CBT), 5.4% group CBT, and 32.4% other therapy that did not focus specifically on ADHD. Similarly, 18% of students in the ADHD group reported previously participating in a psychosocial treatment. Of those ( $n = 52$ ), 42.3% endorsed having participated in individual CBT for ADHD, 9.6% in group CBT for ADHD, 36.5% in therapy unrelated to ADHD, and 11.5% reported their parents received BPT.

Participants in the ADHD group ( $M = 19.74$ ,  $SD = 1.63$ ) did not differ on reported age from the NC group ( $M = 19.58$ ,  $SD = 1.53$ ),  $t(1423) = 1.55$ ,  $p = .12$ . Similarly, participants in the ADHD group did not differ from those in the NC group on demographics variables of sex (65.2% and 66.6% female, respectively), ethnicity (93% and 88.8% Caucasian, respectively), or education level (see Table 1). Parental marital status during childhood (i.e., married, divorced, or separated) also was equivalent across those reporting on this status in the ADHD and NC groups (ADHD  $n = 167$ , NC  $n = 778$ ; see Table 1).

As expected, those students in the ADHD group endorsed more IA ( $M = 4.59$ ,  $SD = 2.67$ ) and HI ( $M = 4.17$ ,  $SD = 2.58$ ) symptoms and higher levels of related, daily functional impairment ( $M = 13.27$ ,  $SD = 6.19$ ), as compared to the IA ( $M = .94$ ,  $SD = 1.38$ ) and HI ( $M = 1.18$ ,  $SD = 1.38$ ) symptoms and daily impairment ( $M = 4.63$ ,  $SD = 4.87$ ) reported by the NC



group (see Table 2). Grade point averages were reported using point-value ranges that increased in increments of 0.5. Students in the ADHD and NC groups did not differ in their reported current college GPA, but did differ in their reported cumulative high school GPAs (see Table 3).

Collateral informants for all participants in the ADHD group were sought, whereas a matched sample (using gender and age) of collateral informants in the control group were contacted. Eighty-two parents or other adult guardians (89.2% mothers) from the ADHD group and 92 (87% mothers) from the NC group completed childhood collateral surveys. Parents of participants in the ADHD group ( $M = 45.96$ ,  $SD = 10.92$ ) did not differ on reported age from the NC group ( $M = 46.11$ ,  $SD = 10.43$ ),  $t(172) = 0.09$ ,  $p = .93$ . Parents of students in both groups were equivalent across sex, ethnicity, and education (see Table 4).

### Measures

**Demographics form.** Student participants reported their sex, date of birth, ethnicity, number of years of education completed, high school GPA, college GPA (if available), college entrance exam scores (such as ACT and/or SAT), history of receiving treatment for mental health problems (i.e., medication, therapy), and date of initial ADHD diagnosis and type of diagnosing provider (if applicable). Student participants reported on the makeup and dynamics of their nuclear family while growing up by responding to 10 items (e.g., primary caregivers, parental marriage status, number of siblings, birth order).

**Barkley's Current Symptoms Scale – Self-Report Form** (Current SS; Barkley & Murphy, 2006). This self-report form includes 18 ADHD, 8 Oppositional Defiant Disorder (ODD), and 10 level of impairment items and was completed by student participants, with

behavior ratings focusing on the past 6 months. Items closely correspond to the *DSM-IV-TR* (APA, 2000) criteria for ADHD and ODD diagnoses, and may be responded to as 0 = “Never/Rarely,” 1 = “Sometimes,” 2 = “Often,” or 3 = “Very Often” applying to the individual. Higher scores indicate a more severe report of ADHD-related symptoms and level of impairment. Internal reliability estimates (i.e., alpha [ $\alpha$ ]) for items measuring IA, hyperactivity, and impairment have been estimated to be .80, .73, and .86, respectively (Fedele et al., 2010) and .87, .79, and .92, respectively for the current study sample.

**Barkley's Childhood Symptoms Scale – Self-Report Form** (Child SS; Barkley & Murphy, 2006). This form was completed by the student participant. It includes 18 ADHD items, 8 ODD items, and 15 *DSM-IV-TR* conduct disorder (CD) items (APA, 2000), and 10 level of impairment items. Reporters were instructed to rate their childhood behavior (ages 5 to 12 years) for ADHD, impairment, and ODD on the same four point scale described for the Current SS. For CD items, however, possible responses are “Yes” and “No,” with the former scored positively (i.e., = 1). Unpublished data from a large college student sample ( $n = 980$ ) suggest that internal validity of this form is satisfactory (ADHD symptoms  $\alpha = .95$ , ADHD impairment  $\alpha = .92$ , ODD  $\alpha = .90$ , CD  $\alpha = .76$ ; Fedele, 2008). Solely the ADHD and impairment items were included in subscale totals for the current study. Internal consistency estimates were .90, .88, and .93 for the IA, HI, and impairment subscales, respectively.

**Barkley's Childhood Symptoms Scale – Other-Report Form** (Child SS-O; Barkley & Murphy, 2006). This form is the collateral informant version of the Child SS, and was formatted accordingly. It was completed by a collateral informant(s) who is familiar with the childhood behavior of the participant. Reporters were instructed to rate the target

participant's behaviors in a fashion parallel to that of the Child-SS (see above). The derived Pearson correlation with Child-SS indicates good agreement ( $r = .75$ ; Barkley et al., 2008), and the primary scales of the form have been shown to be internally consistent (parent-reports,  $n = 55$ , ADHD symptoms and impairment  $\alpha = .95$ ; Fedele, 2008). In the present study, Cronbach alpha values for parent-report were .92, .90, and .94 for IA, HI, and impairment items respectively. Pearson correlations with Child-SS scores indicated strong agreement for IA ( $r = .62$ ), HI ( $r = .50$ ), and impairment ( $r = .59$ ) subscales.

**Parental Authority Questionnaire.** This 30-item scale (PAQ; Buri, 1991) was completed by student participants. Participants responded to statements about their mother's parenting style (e.g., "As I was growing up I knew what my mother expected of me in my family, but I also felt free to discuss those expectations with my mother when I felt that they were unreasonable") by choosing *Strongly Disagree*, *Disagree*, *Agree*, or *Strongly Agree*. In creating the scale, 21 professionals in the fields of psychology, education, sociology, and social work rated items based on whether or not they fit into the three parenting style categories of *permissive* (i.e., "As I was growing up, my mother seldom gave me expectations and guidelines for my behavior"), *authoritarian* (i.e., "My mother has always felt that more force should be used by parents in order to get their children to behave the way they are supposed to"), or *authoritative* (i.e., "As I was growing up, once family policy had been established, my mother discussed the reasoning behind the policy with the children of the family"). Ten items emerged for each of three factors, which were found to be statistically unrelated. Higher scores on a subscale suggest more endorsement of that particular style of parenting. Two week test-retest reliability coefficients have been derived

as follows: .81 for mother's permissiveness, .86 for mother's authoritarianism, .78 for mother's authoritative. Cronbach's  $\alpha$  values ranged from .74 to .87 (Buri, 1991). In the current study, Cronbach's  $\alpha$  values for permissive, authoritarian, and authoritative subscales were .81, .88, and .90, respectively, in the current study. Authoritarianism was inversely related to permissiveness ( $r = -.08, p < .001$ ) and positively correlated with authoritative ( $r = .10, p < .001$ ). Authoritativeness was also positively related to permissiveness ( $r = .36, p < .001$ ).

**Parenting Sense of Competence Scale.** This scale (PSOC; Johnston & Mash, 1989) is a 17-item self-report that examines parenting skills and feelings about being a parent, in general during childrearing (i.e., when the student participant was growing up). The scale includes items such as "Being a parent made me tense and anxious" and "I honestly believe I had all the skills necessary to be a good mother to my child." The response options are *Strongly Agree, Agree, Somewhat Agree, Somewhat Disagree, Disagree, and Strongly Disagree*. Higher scores indicate a greater sense of satisfaction and/or efficacy. Prior estimates of internal consistency ( $\alpha$ ) for the entire scale was .79, with .75 for the satisfaction factor (9 items), and .76 for the efficacy factor (7 items; Johnston & Mash, 1989); in the current study these values were .87 for the entire scale and .83 for both Satisfaction and Efficacy subscales.

**Depression Anxiety Stress Scale-21 (DASS-21; Henry & Crawford, 2005).** This measure includes 21 items that employ a 4-point Likert scale and relate to perceived stress in addition to depression and anxiety (7 items/scale) over the preceding seven days. Higher scores indicate greater distress. Internal consistency for the DASS- 21 has been found to be

excellent ( $\alpha = .90$ , Stress scale; Henry & Crawford, 2005), and in the current study was estimated at .92, .87, and .89 for the depression, anxiety, and stress subscales, respectively. Concurrent validity has previously been established by comparing DASS-21 scores to scores on the Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983) and the Personal Disturbance Scale (Bedford & Foulds, 1978; Henry & Crawford, 2005).

### **Procedure**

The study was approved by each participating university's IRB (Appalachian State University, University of Wyoming, and Northern Iowa University) and all ethical principles related to human subjects research were followed. Data collection was completed online in a survey format. Students were able to sign up for the study via SONA systems (software used to distribute Earned Learning Credits, ELCs) by using a hyperlink to the consent form which included the purpose of the study, procedure, duration, risks, benefits, and compensation. Those not participating for course credit contacted the researcher via email to request the link to the consent form. After the student participants consented to participate, the students listed the name and contact information for collateral informants that could report on their current (significant other or roommate) and childhood behaviors (parent). The online survey with the aforementioned measures was sent to student participants and their collateral informants, as appropriate. Following completion of the survey, participants were compensated (i.e., with ELC or monetary compensation). The survey closed with debriefing information, including researcher, IRB, and counseling center contact information. Refer to Appendices A, B, and C for Institutional Review Board approval and consent forms for student participants and childhood collateral informants, respectively.

## Results

### Parenting Style Across Groups

Out of the 290 students who made up the ADHD group and 1,123 students in the NC group, 276 (95%) and 1,106 (99%) completed the PAQ, respectively. To test the hypothesis that students with ADHD will describe their primary caregivers as more authoritarian or permissive compared to those without ADHD, a series of independent samples *t*-tests were conducted to compare PAQ subscale data (see Table 5). A Bonferonni correction was used to control for familywise error due to conducting more than one *t*-test. Participants in the ADHD ( $M = 31.05$ ,  $SD = 8.41$ ) and NC groups ( $M = 30.13$ ,  $SD = 8.68$ ) did not differ in their report of authoritarian parenting,  $t(1380) = -1.59$ ,  $p = .113$ ,  $d = .05$ . Similarly, the level of recalled caregiver permissiveness was equivalent,  $t(1380) = -.69$ ,  $p = .49$ ,  $d = .05$ , across the ADHD ( $M = 23.63$ ,  $SD = 6.91$ ) and NC groups ( $M = 23.30$ ,  $SD = 6.98$ ).

### Parental Satisfaction and Efficacy Across Groups

An independent samples *t*-test was conducted to test the hypothesis that parents of children with ADHD will report decreased levels of parenting satisfaction and efficacy compared to parents of non-diagnosed children. Results of the analysis are shown in Table 6. Contrary to expectations, parents who raised children with ADHD ( $M = 25.2$ ,  $SD = 7.19$ ) reported significantly higher levels of satisfaction than parents who raised non-diagnosed children ( $M = 20.67$ ,  $SD = 7.59$ ),  $t(168) = -3.99$ ,  $p < .001$ ,  $d = .61$ . Similarly, parents of those in the ADHD group ( $M = 20.80$ ,  $SD = 5.83$ ) reported marginally higher efficacy levels,  $t(169) = -1.99$ ,  $p = .048$ ,  $d = .30$ , than parents of those in the NC group ( $M = 18.91$ ,  $SD =$

6.57). When a Bonferroni correction is applied to control for increased familywise error, the mean efficacy values are not discrepant.

### **Negative Parenting Style, Impairment, and Comorbid Symptoms**

Hierarchical multiple regression analysis was used to assess whether child- (i.e., student-) reported negative parent styles were associated with more impairment in current daily functioning, and whether negative parenting styles differentially affected the groups in this way (i.e., using group x parenting style score interactions). The two negative parenting style scores (i.e., authoritarian and permissive) were entered in the first block, with interaction terms entered in a second block (see Table 7 for a summary of the results). The results of step one of the regression indicated the two predictors (permissive and authoritarian) explained 2.2% of the variance ( $R^2 = .02$ ),  $F(2,1354) = 15.25$ ,  $p < .001$ . It was found that permissiveness independently and significantly predicted impairment ( $\beta = .07$ ,  $p = .010$ ), as did authoritarianism ( $\beta = .137$ ,  $p < .001$ ). Step two explained a very substantial amount of additional variance,  $\Delta R^2 = .301$ ,  $F(4, 1352) = 160.92$ ,  $p < .001$ , with the group x authoritarianism interaction emerging as a significant predictor ( $\beta = .48$ ,  $p < .001$ ). Follow-up simple regression analyses of authoritarianism on impairment in each subgroup indicated that as authoritarian parenting increased, daily impairment increased at a higher rate in the ADHD group ( $\beta = .19$ ,  $p = .001$ ) compared to the NC group ( $\beta = .11$ ,  $p < .001$ ; see Figure 1).

A series of hierarchical multiple regression analyses were conducted to determine if negative parenting style was linked with elevated ADHD symptoms and comorbid depression, anxiety, and stress symptoms amongst the student participants and whether negative parenting styles differentially impacted the groups. Specifically, five separate

hierarchical regression analyses were conducted, entering the two negative parenting styles (authoritarian and permissive) as predictors of HI symptoms, IA symptoms, and the three subscales of the DASS (Depression, Anxiety, and Stress) in step one, with the interaction terms added in the second block. The results of step one indicated permissive and authoritarian parenting styles explained 1.2% of the variance ( $R^2 = .012$ ) in current HI symptoms,  $F(2,1343) = 8.46, p < .001$ ), with only authoritarianism emerging as a significant individual predictor ( $\beta = .11, p < .001$ ). Step two resulted in a significant change in  $R^2$  ( $\Delta R^2 = .32, F[4, 1341] = 325.63, p < .001$ ), with both authoritarian ( $\beta = .44, p < .001$ ) and permissive ( $\beta = .15, p = .007$ ) parenting x group interaction terms emerging as significant predictors. Follow-up simple regression analyses indicated that reported HI symptoms increased with authoritarian subscale scores at a sharper incline for those in the ADHD group ( $\beta = .14, p = .02$ ), as compared to the NC participants ( $\beta = .08, p = .006$ ; see Figure 2). Follow-up simple regression analyses of permissive parenting on HI symptoms in the ADHD and NC groups, however, suggested no meaningful impact in the former ( $\beta = -.04, p = .56$ ) and marginal overall impact in the NC group ( $\beta = .06, p = .07$ ; see Figure 3). Endorsement of IA symptoms was significantly predicted by authoritarianism ( $\beta = .10, p < .001$ ), with 1.0% of the variance explained by step one,  $R^2 = .010, F(2,1339) = 6.95, p = .001$ . Step two explained a sizeable amount of additional variance,  $\Delta R^2 = .40, F(4, 1337) = 236.67, p < .001$ , with both authoritarian ( $\beta = .50, p < .001$ ) and permissive ( $\beta = .16, p = .003$ ) interaction terms emerging as significant predictors. Follow-up simple regressions revealed a relationship between authoritarian parenting and IA symptoms for the ADHD group ( $\beta = .14, p = .03$ ), whereas a non-significant association was found for the NC group ( $\beta = .06, p = .06$ ;



see Figure 4). For the NC group, as permissiveness increased, IA symptoms increased ( $\beta = .07, p = .02$ ), whereas the relationship between IA symptoms and permissiveness in the ADHD group ( $\beta = -.06, p = .30$ ; see Figure 5) was non-significant.

Regression analyses also suggest negative parenting style to be a significant predictor of current report of depressive, anxiety, and stress. The results are shown in Table 7.

Authoritarian and permissive parenting styles explained 1.5% of the variance in levels of depression,  $R^2 = .015, F(2,1379) = 10.77, p < .001$ , with authoritarianism emerging as the significant predictor ( $\beta = .12, p < .001$ ) in step one. In step two, an additional 11% of variance was accounted for, ( $\Delta R^2 = .11, F(4, 1377) = 49.50, p < .001$ ), with the group x authoritarian interaction emerging as a significant predictor, ( $\beta = .30, p < .001$ ). Follow-up simple regression analyses revealed greater increase in depression symptoms with authoritarian parenting in the ADHD group ( $\beta = .16, p = .009$ ) as compared to the association in the NC group ( $\beta = .09, p = .002$ ; see Figure 6).

Next, negative parenting strategies accounted for 2.4% of the variance of anxiety scores in step one of the hierarchical model,  $R^2 = .024, F(2,1379) = 17.07, p < .001$ , and authoritarianism ( $\beta = .13, p < .001$ ) and permissiveness ( $\beta = .10, p < .001$ ) both were significant predictors. Step two added significant explanatory power,  $\Delta R^2 = .13, F(4, 1377) = 64.06, p < .001$ , with both authoritarian ( $\beta = .26, p < .001$ ) and permissive ( $\beta = .12, p = .05$ ) x group interaction terms serving as significant predictors. Follow-up simple regression analyses suggested slightly more influence of authoritarian parenting on anxiety symptoms in the ADHD group ( $\beta = .13, p = .03$ ) as compared to the NC group ( $\beta = .11, p < .001$ ; see Figure 7). Permissive parenting was positively related to anxiety symptoms only in the NC

group ( $\beta = .10, p = .001$ ; see figure 8), having no significant effect in the ADHD group ( $\beta = .05, p = .43$ ). Finally, authoritarian and permissive parenting styles accounted for 2.3% of participants' reported stress levels,  $R^2 = .02, F(2,1379) = 16.52, p < .001$ , as both authoritarianism ( $\beta = .15, p < .001$ ) and permissiveness ( $\beta = .06, p = .03$ ) emerged as significant predictors in step one. Step two resulted in a significant change in  $R^2 = .16, F(4, 1377) = 75.24, p < .001$ , with group x authoritarian interaction emerging as a significant predictor, ( $\beta = .32, p < .001$ ). Follow-up simple regressions revealed a greater increased report of stress as authoritarian parenting increased in the ADHD group ( $\beta = .18, p = .003$ ) compared to the NC group ( $\beta = .12, p < .001$ ; see Figure 9).

### Discussion

Children and adolescents who experience impairments due to ADHD are faced with a unique set of challenges that impact functioning in the classroom, in interpersonal contexts, and in the home (Harrison, Vannest, & Reynolds, 2011; Sobanski et al., 2011). Parents of children with ADHD report increased stress and dissatisfaction compared to parents of children without ADHD (Modesto-Lowe et al., 2008). This stress coupled with the child's disruptive behaviors (i.e., inability to stay on task, impulsivity) may negatively affect the parent-child relationship and parenting strategies. Although ADHD is largely heritable (Waldman & Gizer, 2006), the home environment may impact adjustment in adolescence and as a young adult. The purposes of the current study were to (a) investigate the parenting style as perceived by emerging adults in college and how that relates to current ADHD symptomatology and impairment and (b) to discern parents' sense of competence while rearing their child, and whether that varied across ADHD and non-ADHD student groups.

### **Parenting Style and ADHD**

Contrary to expectations, college students in the ADHD group did not significantly differ from those in the matched control group (non-diagnosed age-, ethnicity-, and gender-equivalent peers) in their report of their parent's strategies during their childhood, as they reported similar levels of permissiveness, authoritarianism, and authoritativeness. This is in contrast to outcomes of studies conducted with children and adolescents, such that parents of children with ADHD tend to exhibit high levels of harsh discipline coupled with low warmth (e.g., authoritarian) or low control with high warmth (e.g., permissive; Johnston & Mash, 2001); however, some have asserted that oppositional and defiant behaviors that often accompany ADHD are what drive the negative parent-child relationship. Indeed, when conduct problems are accounted for, the relationship between negative parenting and ADHD symptoms has been shown to be negligible in several studies (Deault, 2010; Harvey, Metcalfe, Herbert, & Fanton, 2011; Kashdan et al, 2004; Piffner, McBurnett, Rathouz, & Judice, 2005). Although conduct problems were not taken into account in the present study, it is plausible the rate of a current or previous diagnosis of ODD/CD is lower than in other samples of young adults with ADHD.

There have been fewer studies retrospectively examining parenting style in young adults with ADHD. Jones, Rabinovitch, and Hubbard (2012) analyzed the relationship of parenting style and academic adjustment in college students and found parenting style moderated adjustment to college differently depending on level of ADHD symptomatology. Additionally, the authors found that college students who reported high ADHD severity experienced lower adjustment regardless of level of authoritative parenting style. Even in the

context of positive parenting, those who were more highly impaired were not buffered against negative effects of ADHD. Given these findings, future studies should examine ADHD dimensionally with the goal of describing potential differential detrimental effects of negative parenting.

While there is ample evidence to suggest early maternal rearing strategies have an impact on young adult identity development (Dumas, Lawford, Tieu, & Pratt, 2009), emotional adjustment, and delinquent behaviors (Jones, Forehand, & Beach, 2000), it remains unclear whether ADHD-related adjustment is significantly impacted by parenting beyond adolescence. Parenting style may have a decreased impact on college students, given that the young adult is no longer living in the home and contact with parents may be limited. Although college students may have developed a foundational framework from which to interact with the world based on the relative warmth and control provided by their parents, they may draw on other supports once they move out. For example, coping strategies and social support from peers influences academic-related adjustment, whereas parental support and mothers' parenting style may have little to no effect (Smith & Renk, 2007). Additionally, parental education level has been shown to mediate the relationship between parenting style and young adult achievement which may serve as an additional explanation as to why parenting style may not have had a differentiating impact on college students in the current study (Singh-Manoux, Fonagy, & Marmot, 2006). In fact, students in the ADHD group were more likely to endorse higher levels of authoritarianism ( $p = .04$ ) when their parents had lower levels of education (i.e., did not attain a Bachelor's degree), suggesting parental level of education may be associated with the strategies used in child rearing and

could thus be a related factor in the long-term impact of experienced parenting in those with ADHD.

Children diagnosed with ADHD are less likely to attend a four-year college and have lower general vocational success compared to those without a diagnosis (Kuriyan et al., 2013). Arguably, individuals with milder ADHD-related impairment or those who have participated in academic interventions are the ones most likely to gain admission to and attend college. Given the lesser nature of their impairment, as compared to non-matriculating peers with ADHD, the manner in which they were reared may not be a factor that is strongly correlated with their adjustment as a young adult or that differentiates them from non-diagnosed classmates. Further, in the present study, the students in the ADHD group on average reported currently experiencing slightly fewer than five IA and/or HI symptoms (see Table 2) and many may accordingly fall short of the official severity threshold for ADHD diagnosis, despite clearly higher overall ADHD-related impairment relative to the non-ADHD (NC) group. Still, the students in the ADHD group reported an equivalent academic performance as compared to NC peers, evidencing a lack of significant academic impairment that might be expected in typical adults with ADHD. Perhaps it is the case that the relationship between parenting style and adjustment beyond adolescence for those experiencing minimal ADHD symptoms is insubstantial, but it remains to be seen whether the small effects of negative parenting noted herein are similar across the ADHD and NC populations.

Furthermore, the retrospective, self-report version of the PAQ may not have reliably measured actual parenting style while the child was growing up. The college students

reporting on their perception of how their parents reared them may have been subject to particular cognitive biases, such as the positive illusory bias (PIB) and the rosy retrospection phenomenon. It has been well established that children with ADHD overestimate their competence in domains such as academic achievement, social performance, and general conduct in addition to performance on specific tasks (Hoza et al., 2004; Mikami, Calhoun, & Abikoff, 2010). In other words, despite functional limitations experienced by those with ADHD that are readily observable by others, an overly positive self-evaluation often occurs. Explanations of such cognitive distortions have included self-preservation, cognitive immaturity, and neurological deficits (Owens, Goldfine, Evangelista, Hoza, & Kaiser, 2007). As it has been suggested that PIB may extend into adulthood for those with ADHD (Canu & Carlson, 2007; Manor et al., 2012), participants in the ADHD group in the current study may have remembered their own parent-child interactions with similar exaggerated optimism. .

Adults, regardless of ADHD status, will consistently rate past events as more positively (rosy retrospection) than was actually experienced during the event, especially if they anticipated enjoying the event (Mitchell, Thompson, Peterson, & Cronk, 1997). For most, an increased number of pleasant autobiographical events are recalled and positive emotions related to these memories are slower to dampen compared to negative emotions (Walker, Skowronski, & Thompson, 2003). In sum, PIB and rosy retrospection may have decreased awareness of punitive or lax discipline and monitoring in their childhood home and lowered endorsement of negative parenting, particularly in the ADHD group.

### **Parental Satisfaction and Efficacy**

Also contrary to expectations, the parents of the emerging adults in the ADHD group reported feeling both *more* satisfied and efficacious (although marginally) during their childrearing years, as compared to parents of those in the NC group. The parents of students in the ADHD group reported relatively low childhood IA, HI, and functional impairment in their children (see Table 2), and it follows that this may positively influence their recollection of parenting competence and efficacy, at least as compared to parents with more severely affected children. In other words, children with a mild presentation of ADHD may exhibit behaviors that are more manageable and less stressful compared to children with moderate or severe symptoms related to ADHD, and given that the current elevated ADHD subsample is composed of “high-functioning” college students this may be important to take into consideration in interpreting the parent-reported data.

Similar to students reporting a “rosier” perception of how they were parented, their caregivers may have been affected by the rosy retrospection phenomenon. It has been consistently found that parents retrospectively report a more positive view of raising children compared to that of the child, perhaps in an attempt to minimize difficulty as a parent (Brewin, Andrews, & Gotlib, 1993). Further, when compared to childhood records, mothers tend to underestimate internalizing and externalizing symptoms of their college-aged children at retrospective recall, describing a more positive family environment (Renk, Roberts, Klein, Rojas-Vilches, & Sieger, 2005). Given these tendencies, parents in the current study may have discounted the stress experienced while raising their child with ADHD. To wit, because their students attend a four-year college and have arguably successfully “launched,”

caregivers of students in the ADHD group may experience increased satisfaction and efficacy as a parent, given the challenges of parenting a child with ADHD. Likewise, due to their child's current academic achievement, parents of those in the ADHD group may feel a sense of accomplishment, as they were able to effectively aid their child in overcoming functional impairments experienced as a child and adolescent.

### **Parenting Style, ADHD Symptoms and Impairment, and Internalizing Symptoms**

Finally, it was projected that participants in both groups would be significantly more likely to endorse more symptoms of ADHD and comorbid effects when they reported experiencing a negative parenting style while growing up. Across all student participants, permissive and authoritarian parenting styles were associated with reports of higher impairment in daily functioning, anxiety and stress. Authoritarianism alone predicted symptoms of HI, IA, and depression. This is generally consistent with previous studies examining the impact of parenting style on various outcome domains, such that children and adolescents who are raised using a more permissive approach are more likely to exhibit lower cognitive competence, self-esteem, and less individuation (Baumrind, Larzelere, & Owens, 2010; Kaufman et al., 2000), while an overly harsh and demanding parenting style has been linked to increased emotional difficulties (Aquilino & Supple, 2001), aggression (Thompson, Hollis, & Richards, 2003) and anxiety and lower academic achievement as a college student (Silva, Dorso, Azhar, & Renk, 2007). Commensurate to the current findings, females in an ADHD college student sample endorsed poorer functioning in the presence of authoritarian parenting as a child, suggesting a detrimental impact of an unsupportive and rigid home environment (McKinney, Milone, & Renk, 2011).



Although the students in the ADHD group did not report a difference in the way they were parented, in comparison to those in the NC group, the extent of negative parenting they *did* experience is positively associated with ADHD and emotional functioning symptoms to a much higher degree, with effect sizes ranging from .13 to .42 (see Table 7). The distribution of students' authoritarian parenting scores, in particular, was negatively skewed (-.189), suggesting that sufficient parenting of this variety was endorsed in this sample to assess negative sequelae. Authoritarian parenting in participants in the ADHD group had a stronger relationship to impairment, and HI, IA, depression, anxiety, and stress symptoms. This style of parenting is characterized by low parental warmth, high control, and coercive strategies such as corporal punishment (Baumrind, 1966). Corporal punishment used frequently (Straus & Kaufman, 1994) and in the context of low parental warmth and support has been shown to be associated with increased aggression, delinquency, and internalizing symptoms in children and adolescents (McLoyd & Smith, 2002; Simons, Johnson, & Conger, 1994).

Youth with a diagnosis of ADHD may be more negatively influenced by harsh parenting due to specific genetic risk factors associated with the disorder. For instance, early maternal parenting has shown to influence future conduct symptoms in the presence of the ADHD-linked 9-repeat allele of the dopaminergic DAT1 3' VNTR gene (Lahey et al., 2011). Likewise, the quality of parenting may interact with this genotype and the dopamine D4 receptor to produce a phenotype that displays greater impairments in the presence of an overly critical parenting style (Bakermans-Kranenburg, & van Ijzendoorn, 2006; Sheese, Voelker, Rothbart, & Posner, 2007). It is possible that these or similar genetic differences

place children and adolescents with ADHD at greater risk for adjustment difficulties in young adulthood, too, by exacerbating sensitivity to negative parenting practices.

In addition, specific genes interact with the environment (e.g., negative parenting) to produce problematic variations in the reward and EF pathways directed by various neurotransmitters (i.e., dopamine, serotonin). In particular, EF, or the abilities related to organizing and planning ahead to meet goals and that is theorized as central to HI and IA in adults with ADHD (Barkley et al., 2008), is often compromised in this way (Boonstra, Oosterlaan, Sergeant, & Buitelaar, 2005). EF has, in fact, been specifically shown to be adversely affected by ineffective parenting (Bernier, Carlson, Deschenes, Matte-Gagne, 2012). Individuals with ADHD have difficulty regulating emotions, inhibiting behavioral responses, and delaying gratification (Barkley et al., 2008). These impairments are then likely exacerbated by parenting that does not explicitly and externally guide their children in behavioral and emotional regulation. Additionally, parenting that is overly punitive, unreasonable, and lacks a forum for parent-child discussion of consequences may inhibit the development of metacognitive abilities, which aid in problem solving (Schroeder & Kelley, 2009). Compared to those without ADHD and who exhibit typical EF, children diagnosed with ADHD are at a distinct disadvantage.

Further, children with ADHD are at higher risk for developing conduct, oppositional defiant, and mood disorders as adolescents, compared to non-diagnosed peers (Kessler et al., 2006; Yoshimasu et al., 2012). The propensity for experiencing depression, in particular, may interact with the nature of parenting. For example, youth with ADHD encounter significant problems across multiple domains. Academic performance, behaviors in the

classroom, and peer relationships may all be negatively affected. Not meeting expectations in the school and social arenas puts a strain on the parent-child relationship. That relationship and the home setting, then, where the child might expect to find a safe haven, are transformed into additional sources of stress. This increased vulnerability coupled with general risks associated with authoritarian parenting may engender a greater long-term impact on personal distress, depression, anxiety, and other functional impairment. This suggests, along with other research (Deault, 2010; Ellis & Nigg, 2009; Johnston & Mash, 2001; Modesto-Lowe, 2008), that the quality of family context for those growing up with ADHD— and, in this case authoritarian parenting— could be a productive target for intervention for youth with ADHD.

Across the entire sample, permissive parenting was predictive of impairment, anxiety, and stress, albeit explaining relatively small proportions of variance (Cohen, 1988). Permissive parenting was uniquely associated with current IA and anxiety symptoms only for those in the NC group, such that higher permissiveness corresponded to more pathology. Permissiveness is identified by lower behavioral control and with higher levels of warmth (Baumrind, 1966). There have been equivocal findings related to the influence of permissive parenting and child and adolescent outcomes. Increased laxness has been associated with both higher and lower academic achievement, higher tobacco and alcohol use (Cohen & Rice, 1997), and no impact on self-esteem (Buri, Louiselle, Misukanis, & Mueller, 1988) or other measures of psychopathology (Uji, Sakamoto, Adachi, & Kitamura, 2014); however, for children with behavioral problems, permissiveness has been related to increased disruptiveness (Parent et al, 2011). The low levels of structure does not provide sufficient

scaffolding to facilitate the child staying on task, paying close attention to detail, and following through with directives.

Being parented with increased laxness, low control and direction was associated with increased worry and distractibility only for those in the non-ADHD group, a finding that was expected across the entire sample. As described above, the ADHD group consisted of particularly high functioning college students who had commensurate academic achievement as the non-diagnosed participants, for example. Those in the ADHD group may not have been negatively affected by the unstructured home environment due having to master emotional and behavioral regulation prior to beginning college. In the presence of permissive parenting as a child and adolescent, those with less severe cases of ADHD may have been capable of developing strategies without their parents' assistance in order to be successful in life domains such as interpersonal relationships, academic achievement, and self-care. For example, strategies to combat inattentive symptoms (i.e., using auditory or visual cues to refocus attention) may have been refined. However, those in the NC group may not have been given such opportunities to develop effective coping skills with permissive caregivers because they did not face the same challenges that those with ADHD did prior to college. Furthermore, they then fail to adequately contend with the more challenging college environment, given their deficits. Specifically, the lack of demandingness is predictive of adjustment difficulties in adolescence (Gunnore, 2013), making the transition to higher education from high school wrought with obstacles. However, an overall caveat to these interpretations is that the distribution of participants' permissive parenting scores was positively skewed (.243), a signal that perhaps there was an insufficient proportion of parents

who heavily employed permissive techniques to accurately gauge this parenting style's effects.

### **Limitations and Future Directions**

Several limitations deserve mention regarding the current study. The relationships between parenting style and college student adjustment described above does not prove causation, a point that is even more salient given the cross-sectional nature of the study. Therefore, future studies should include measuring symptoms, impairment and parenting variables at multiple time points from at least early adolescence into early adulthood. This will provide the ability to measure the developmental trajectory of psychopathology as compared to parenting style experienced by individuals with ADHD. Importantly, the ADHD group was largely made up of students who reported a previous diagnosis (71%) compared to those who were identified solely based on self-endorsed symptoms. Therefore, the findings may only be generalized to those college students who have been diagnosed by a medical doctor, psychologist, or mental healthcare professional and less so for those who report experiencing significant HI or IA symptoms.

As noted above, college student populations have inherent restriction of range limitations, and future research should focus on the recruitment of more diverse samples. The current findings were derived in a largely Caucasian sample, and thus the detrimental effects of negative parenting in those with ADHD may not generalize to those of other ethnic backgrounds. Cultural acceptability of varying degrees of authoritarianism and permissiveness, for example, may mediate the impact on behavior difficulties. The current study largely focused on the two prototypical negative parenting styles. Future studies could

also productively examine the potential buffering effect of positive parenting (i.e., authoritative) techniques on ADHD symptoms and comorbid disorders. Additional family characteristics that have shown to specifically affect children with ADHD, such as maternal depression, the role of paternal involvement, and the parent-child relationship, should be included as potential moderators of the relationship between maternal parenting style and child ADHD symptoms. Further, observations of parent-child interactions would provide nuanced and objective insight into exactly which parenting behaviors (i.e., warmth, reactivity) may drive the detrimental outcomes for those with ADHD, and allow for more efficacious parent training interventions.

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Table 1

*Student Participant Demographic Data*

		ADHD Group	NC Group
		<i>N</i> (%)	<i>N</i> (%)
Sex	Male	101(34.8)	378(33.4)
	Female	189(65.2)	754(66.6)
Ethnicity	Caucasian	264(91)	995(87.4)
	African American	1(0.3)	32(2.8)
	American Indian	3(1.0)	18(1.6)
	Hispanic/Latino	8(2.8)	33(2.9)
	Asian/Asian-American	8(2.8)	43(3.8)
	Biracial or Other	6(2.1)	17(1.5)
Education Level	Freshman	69(23.8)	321(28.2)
	Sophomore	85(29.3)	351(30.8)
	Junior	66(22.8)	205(18.0)
	Senior	42(14.5)	156(13.7)
	College Graduate	27(9.3)	98(8.6)
	Some Graduate School	1(0.3)	3(0.3)
Parent Marital Status	Married	114(68.3)	575(73.9)
	Separated	19(11.4)	91(11.7)
	Divorced	34(20.4)	112(14.4)



Table 2

*Current and Childhood ADHD Symptoms and Impairment*

		ADHD Group		NC Group	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Self-Report Current	IA	4.59	2.67	.937	1.387
	HI	4.17	2.58	1.18	1.38
	Impairment	13.27	6.19	4.63	4.87
Self-Report Childhood	IA	4.50	3.17	.940	1.77
	HI	4.50	3.14	1.24	1.93
	Impairment	9.50	6.05	3.44	4.20
Parent-Report Childhood	IA	3.23	3.27	.556	1.48
	HI	2.09	2.84	.422	1.03
	Impairment	6.72	5.70	1.78	3.16

Table 3

*Reported Student Participant College and High School GPA*

		ADHD Group	NC Group
		<i>N</i> (%)	<i>N</i> (%)
College GPA	0.0-0.5	2(0.7)	9(0.8)
	0.6-1.0	2(0.7)	4(0.4)
	1.1-1.5	3(1.0)	8(0.7)
	1.6-2.0	11(3.8)	33(2.9)
	2.1-2.5	34(11.7)	110(9.7)
	2.6-3.0	87(30.0)	274(24.1)
	3.1-3.5	93(32.1)	411(36.1)
	3.6-4.0	50(17.2)	268(23.6)
High School GPA	0.0-0.5	1(0.3)	1(0.1)
	0.6-1.0	-	-
	1.1-1.5	-	-
	1.6-2.0	4(1.4)	1(0.1)
	2.1-2.5	13(4.5)	11(1.0)
	2.6-3.0	40(13.8)	77(6.8)
	3.1-3.5	106(36.6)	354(31.2)
	3.6-4.0	126(43.4)	692(60.9)

Table 4

*Childhood Collateral (Parent) Demographic Data*

		ADHD Group	NC Group
		<i>N</i> (%)	<i>N</i> (%)
Sex	Male	9(10.8)	12(13)
	Female	74(89.2)	80(87)
Ethnicity	Caucasian	78(94%)	87(95.6)
	African American	-	1(1.1)
	American Indian	-	-
	Hispanic/Latino	2(2.4)	-
	Asian/Asian-American	2(2.4)	-
	Biracial or Other	1(1.2)	2(2.2)
Level of Education	Some High School	1(1.2)	-
	Some College	27(32.5)	41(44.6)
	College Graduate	30(36.1)	23(25.0)
	Some Graduate School or Higher	25(30.1)	28(30.4)

Table 5

*Negative Parenting Style t-Tests*

	ADHD Group		NC Group		<i>t</i>	95% Confidence	
						Interval	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		Lower Bound	Upper Bound
Authoritarian	31.05	8.41	30.13	8.68	-1.59	-2.06	.217
Permissive	23.63	6.91	23.30	6.98	-.691	-1.24	.595

Table 6

*Parental Satisfaction and Efficacy*

	ADHD Group		NC Group		<i>t</i>	95% Confidence Interval	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		Lower	Upper
						Bound	Bound
Satisfaction	25.2	7.12	20.67	7.59	-3.99	-6.77	-2.28
Efficacy	20.80	5.83	18.91	6.57	-1.99	-3.77	-.015

Table 7

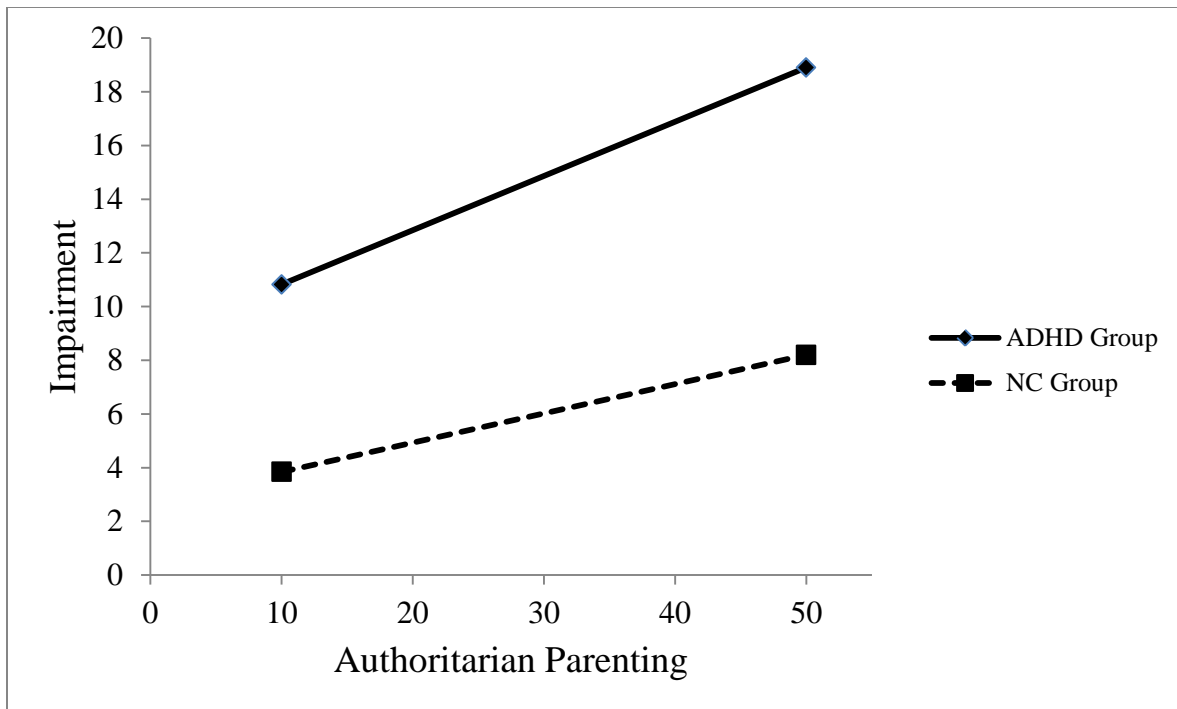
*Summary of Hierarchical Multiple Regression Analyses*

<b>Impairment</b>					
	$R^2$	$\Delta R^2$	$F(\Delta R^2)$	$\beta$	$p$
Step 1	.022		15.25		<.001
Authoritarian				.137	<.001
Permissive				.07	.010
Step 2	.323	.301	160.92		<.001
Group x Authoritarian				.476	<.001
Group x Permissive				.087	.123
<b>HI Symptoms</b>					
	$R^2$	$\Delta R^2$	$F(\Delta R^2)$	$\beta$	$p$
Step 1	.012		8.46		<.001
Authoritarian				.107	<.001
Permissive				.042	.125
Step 2	.335	.323	325.63		<.001
Group x Authoritarian				.436	<.001
Group x Permissive				.150	.007
<b>IA Symptoms</b>					
	$R^2$	$\Delta R^2$	$F(\Delta R^2)$	$\beta$	$p$
Step 1	.010		6.95		.001
Authoritarian				.097	<.001

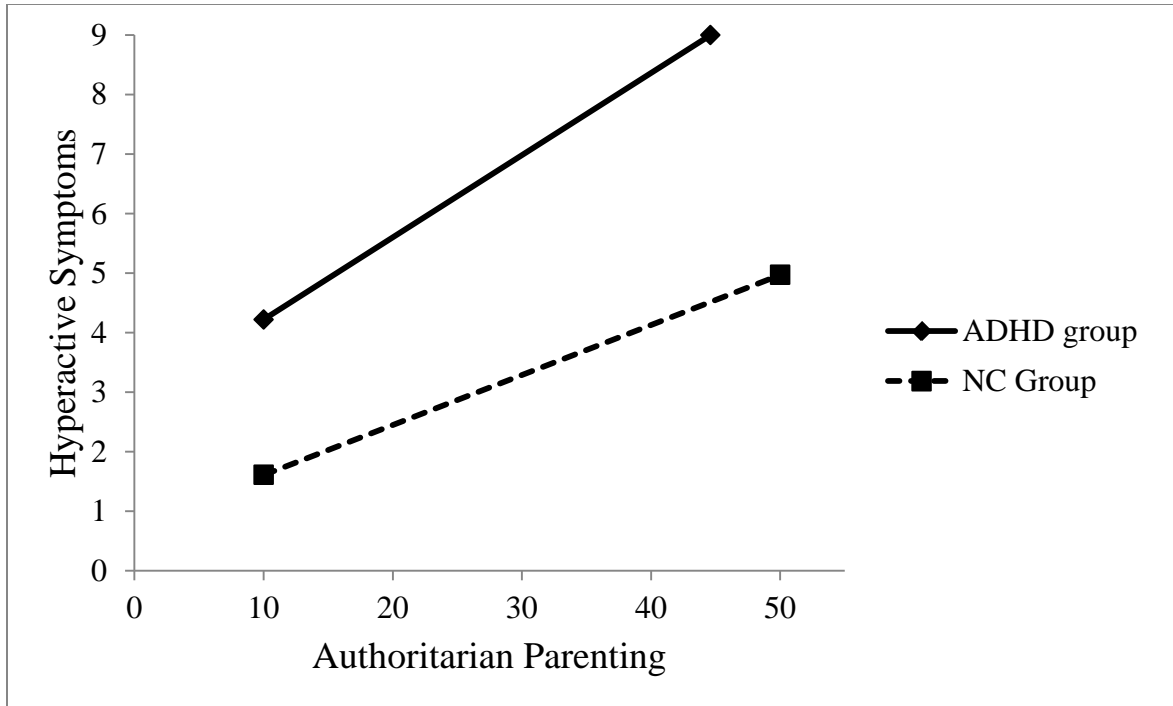
Permissive				.039	.156
Step 2	.415	.404	236.67		<.001
Group x Authoritarian				.500	<.001
Group x Permissive				.155	.003
<b>Depression</b>					
	<i>R</i> <sup>2</sup>	$\Delta R^2$	<i>F</i> ( $\Delta R^2$ )	$\beta$	<i>p</i>
Step 1	.015		10.77		<.001
Authoritarian				.119	<.001
Permissive				.046	.089
Step 2	.126	.110	49.50		<.001
Group x Authoritarian				.299	<.001
Group x Permissive				.041	.516
<b>Anxiety</b>					
	<i>R</i> <sup>2</sup>	$\Delta R^2$	<i>F</i> ( $\Delta R^2$ )	$\beta$	<i>p</i>
Step 1	.024		17.07		<.001
Authoritarian				.130	<.001
Permissive				.096	<.001
Step 2	.154	.133	64.06		<.001
Group x Authoritarian				.255	<.001
Group x Permissive				.121	.050
<b>Stress</b>					
	<i>R</i> <sup>2</sup>	$\Delta R^2$	<i>F</i> ( $\Delta R^2$ )	$\beta$	<i>p</i>

Step 1	.023		16.52	<.001
Authoritarian			.146	<.001
Permissive			.059	.027
Step 2	.179	.156	75.24	<.001
Group x Authoritarian			.321	<.001
Group x Permissive			.085	<.164

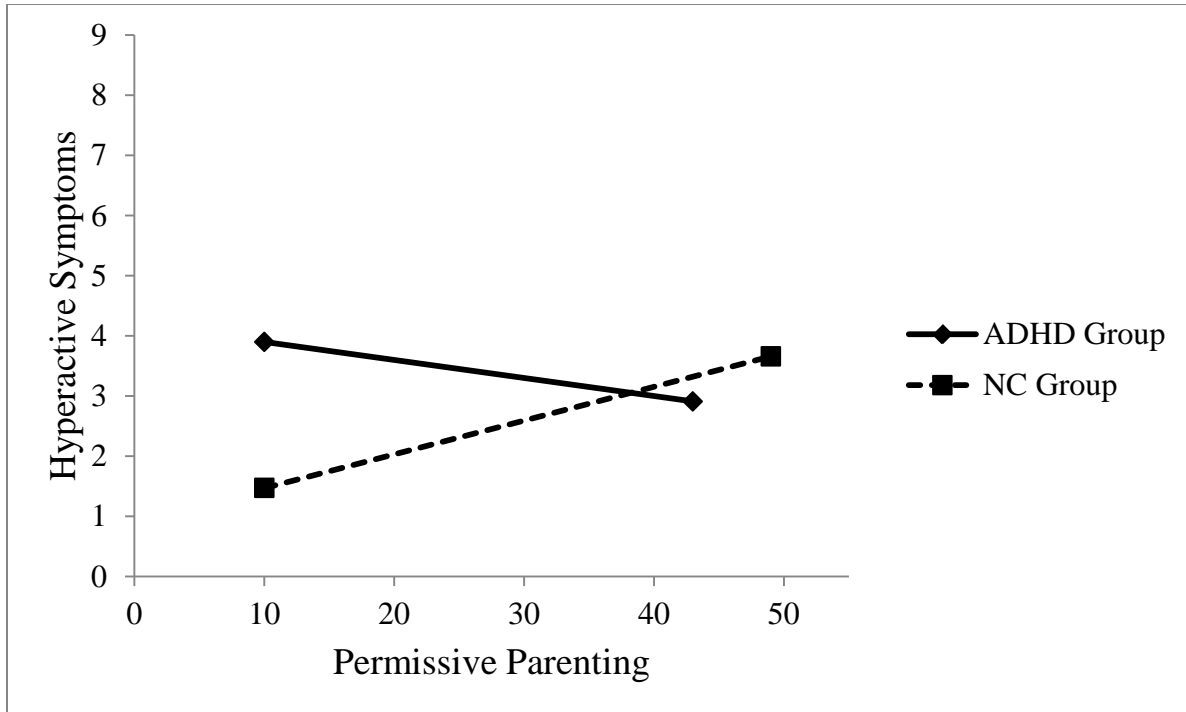




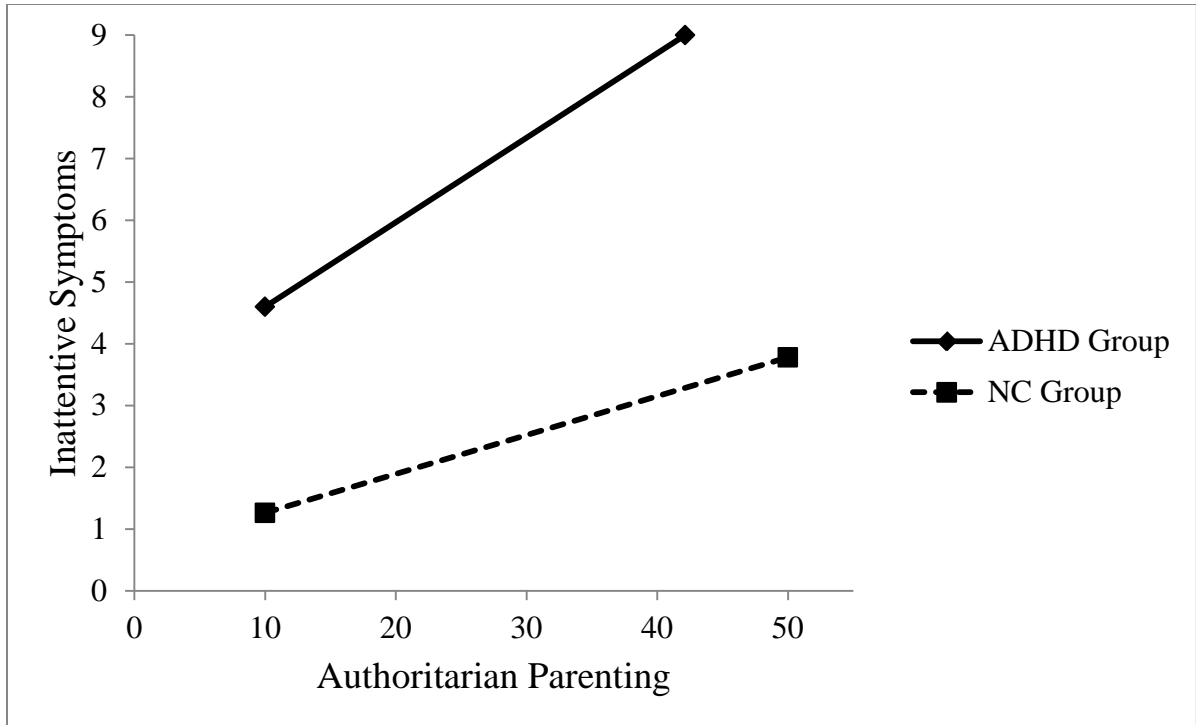
*Figure 1.* Significant interaction between authoritarian parenting and group assignment on daily impairment.



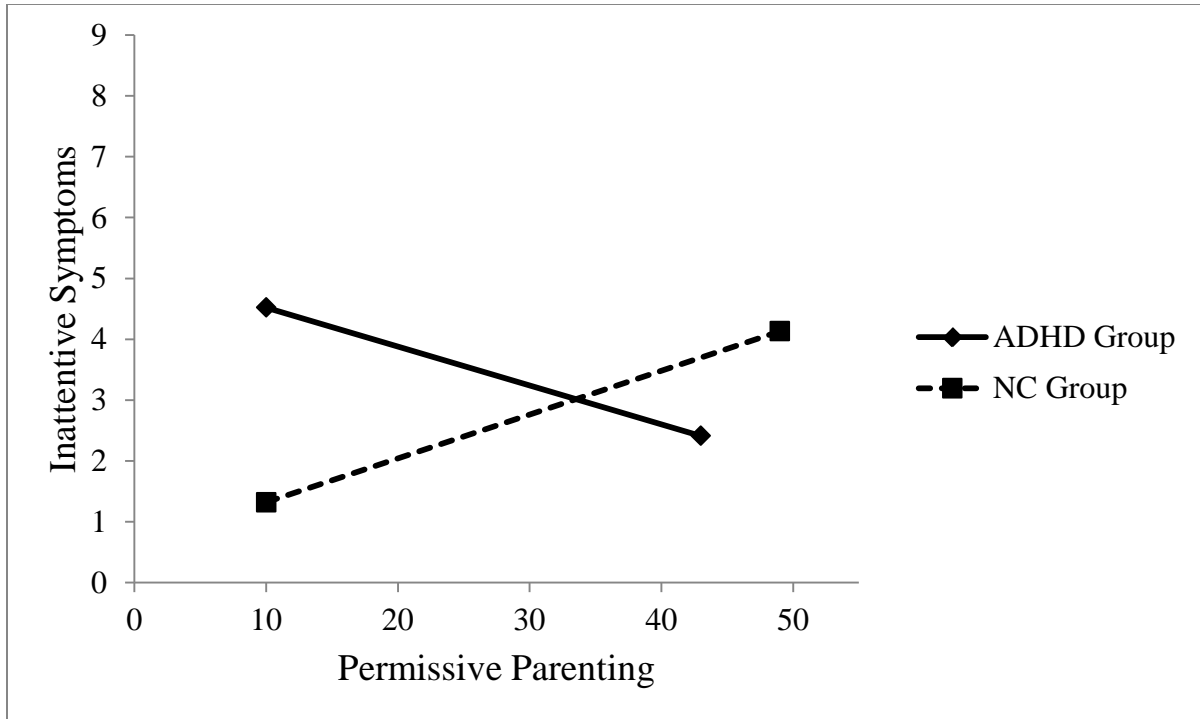
*Figure 2.* Significant interaction between authoritarian parenting and group assignment on HI symptoms. The maximum number of HI symptoms (9) was used for the ADHD group due to the maximum authoritarian parenting value yielding more than nine HI symptoms.



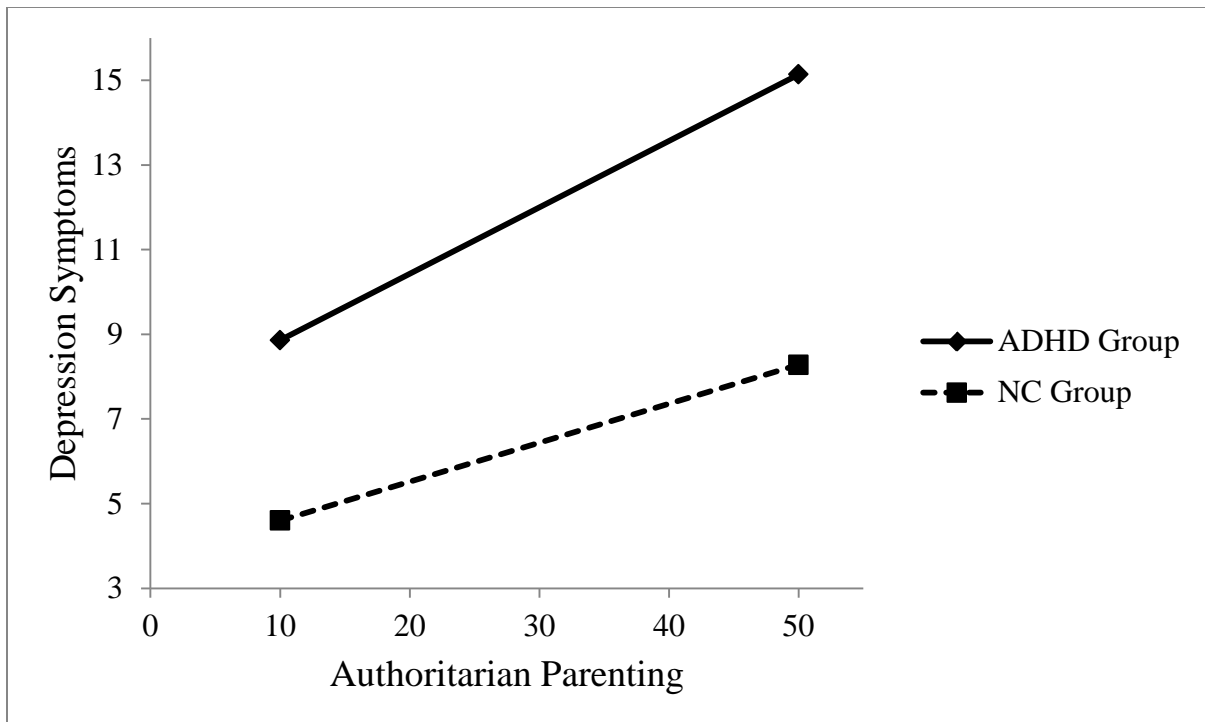
*Figure 3.* Significant interaction between permissive parenting and group assignment on HI symptoms. The observed permissive parenting maximum values for the ADHD and NC groups were 43 and 49, respectively. Follow-up simple regressions suggested a non-significant relationship between permissive parenting and HI symptoms in the ADHD group and a marginally ( $p < .10$ ) significant one in the NC group.



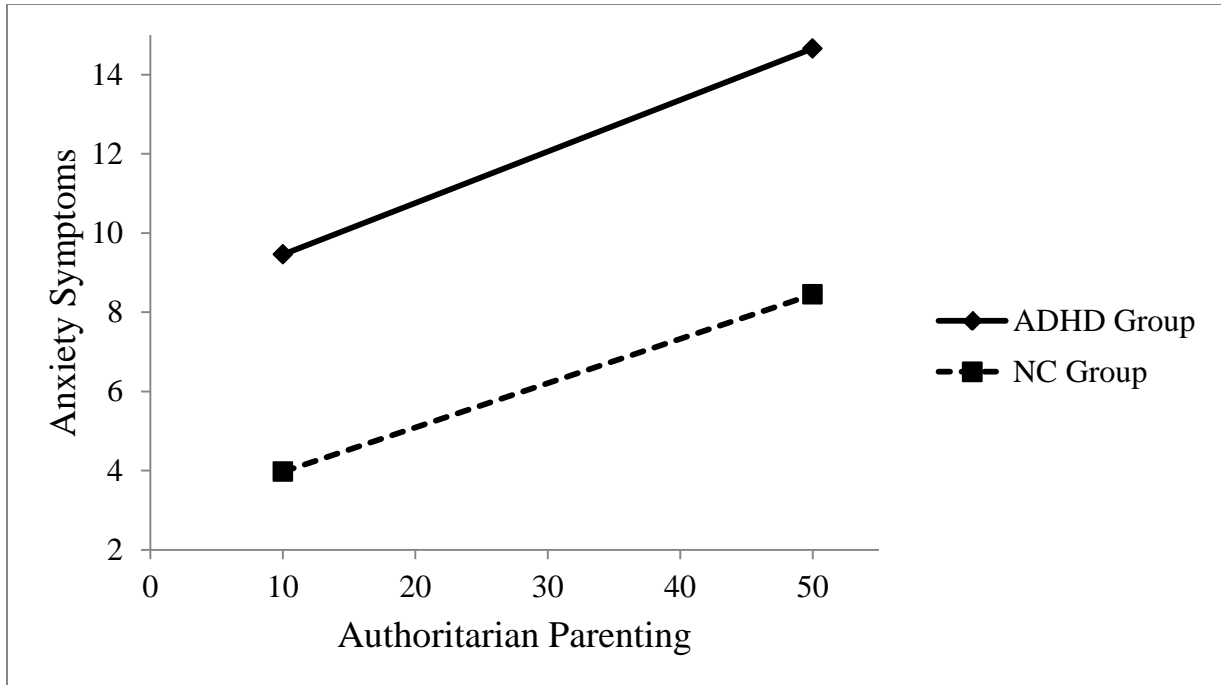
*Figure 4.* Significant interaction between authoritarian parenting and group assignment on IA symptoms. The observed authoritarian parenting maximum values for the ADHD and NC groups were 49 and 50, respectively. The maximum number of IA symptoms (9) was used for the ADHD group due to the maximum authoritarian parenting value yielding more than nine IA symptoms. There was a non-significant relationship for the NC group.



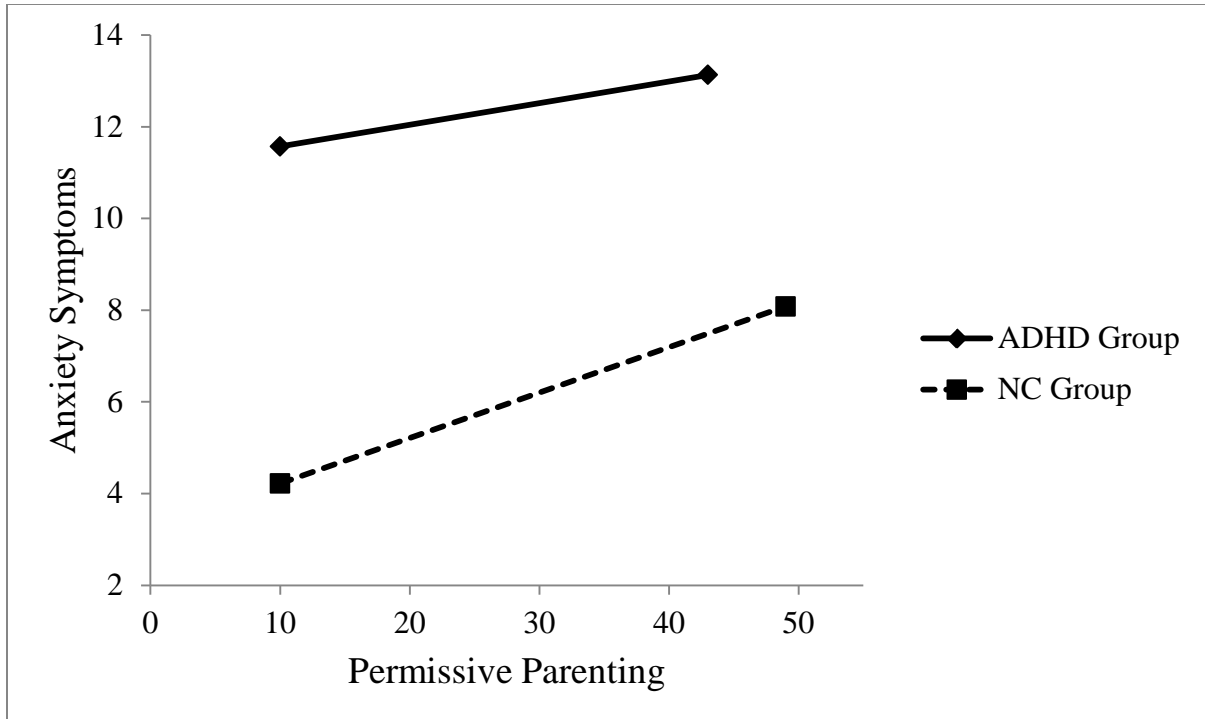
*Figure 5.* Significant interaction between permissive parenting and group assignment on IA symptoms. The observed permissive parenting maximum values for the ADHD and NC groups were 43 and 49, respectively. There was a non-significant relationship for the ADHD group.



*Figure 6.* Significant interaction between authoritarian parenting and group assignment on depression symptoms.

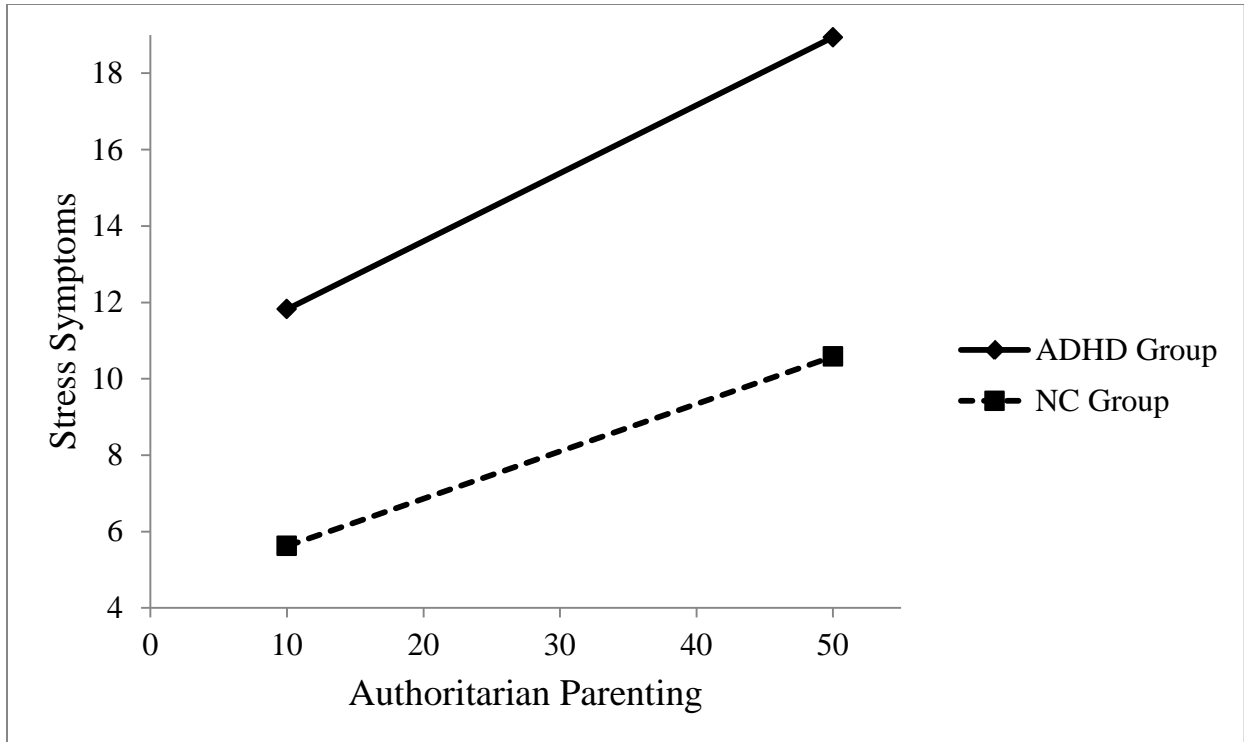


*Figure 7.* Significant interaction between authoritarian parenting and group assignment on anxiety symptoms.



*Figure 8.* Significant interaction between permissive parenting and group assignment on anxiety symptoms. The observed permissive parenting maximum values for the ADHD and NC groups were 43 and 49, respectively. There was a non-significant relationship for the ADHD group.





*Figure 9.* Significant interaction between authoritarian parenting and group assignment on stress symptoms.

## Appendix A

**To:** Will Canu  
Psychology  
CAMPUS MAIL

**From:** Dr. Stan Aeschleman, Institutional Review Board Chairperson

**Date:** 11/06/2012

**RE:** Notice of IRB Approval by Expedited Review (under 45 CFR 46.110)

**Study #:** 11-0276

**Study Title:** Establishing Age Appropriate Symptom Criteria for Assessing ADHD in Young Adults

**Submission Type:** Modification

**Expedited Category:** (9) Continuing Review of Previously Reviewed Research When Categories 2-8 Do Not Apply and Minimal Risk

**Approval Date:** 11/06/2012

**Expiration Date of Approval:** 6/10/2013 This submission has been approved by the Institutional Review Board for the period indicated. It has been determined that the risk involved in this modification is no more than minimal. **Investigator's Responsibilities:**

Federal regulations require that all research be reviewed at least annually. It is the Principal Investigator's responsibility to submit for renewal and obtain approval before the expiration date. You may not continue any research activity beyond the expiration date without IRB approval. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date. You are required to obtain IRB approval for any changes to any aspect of this study before they can be implemented except to eliminate apparent immediate hazards. Should any adverse event or unanticipated problem involving risks to subjects occur it must be reported immediately to the IRB.

CC:

Anne Stevens, Psychology Clinic

Appendix B  
Student Participant Consent Form

**Purpose of Research.**

Previous studies have suggested that the symptoms of Attention-Deficit/Hyperactivity Disorder (ADHD) vary across the lifespan, but little research evidence exists regarding how ADHD manifests in emerging adults (such as college students). This study seeks to extend the current research base by examining a new set of diagnostic criteria in the college student population at Appalachian State University, among other universities, with the aim of establishing ADHD criteria that are age appropriate for this age group. Specifically, you will be asked to complete questions regarding personal history (such as ethnicity, age, family structure, education, grades, history of psychological diagnosis and/or treatment), current (past 6 months) and past (ages 5 to 12) behaviors that have been shown to be related to ADHD (including some “oppositional” and “delinquent” behaviors and your current mood and stress level), and how much these behaviors may have affected your adjustment in your life. You will also be asked to answer questions related to your mood and perceptions of your mother’s parenting style while growing up at home. You will also be asked to rate your comfort level in personal relationships and your mastery of communication skills, reaching goals, organization, time management, and academic skills. The researchers also are examining whether ADHD symptoms and impairment differ between men and women, and also how the impressions of significant others (such as parents, romantic partners) correspond to college students’ behavioral reports. Please note that we will be asking you to provide us with contact information of a parent and a “significant other” (if available) in order for us to collect the appropriate data. Collateral informants of all individuals indicating a prior diagnosis or clinically elevated (> 93rd percentile, approximately 200 sought) symptoms of ADHD will be contacted for participation. The collateral contacts of only about one in five individuals without such ADHD traits (again, approximately 200 total) will be contacted, based on characteristics (age and gender) matching those of ADHD-positive participants. Participation and answers given in this study, by students or their collateral informants, should not be considered as “diagnostic.” Clinical diagnoses of ADHD and/or other disorders can only be made in more comprehensive, in-person assessments by qualified mental health or medical professionals.

**Duration of Participation.** Participation will take approximately one hour, and you will complete the study online. No follow-up procedures are planned.

**Risks to the Individual.** There are minimal foreseeable risks, either physical or psychological, associated with your participation in this study. The surveys you will complete relate to the constructs noted above, and include questions about your behaviors (including mental health history and some illegal activities in childhood and adolescence, like aggression toward others, truancy, and property destruction) and current and past adjustment in school, at home,

and in other situations. At any time, you may choose to skip questions that you think are stressful; this will not affect reimbursement or course credit received for experiment completion. The data collection for this study is conducted online, and no method of transmission over the Internet, or method of electronic storage, is perfectly secure. Therefore, we cannot guarantee absolute security. However, we anticipate that the information being requested will put you at no greater risk than you would typically encounter during a routine psychological examination.

**Benefits to the Individual or Others.** While there is no direct benefit to you for participating in this study, the information derived from this project may have important societal benefits. Specifically, the information gained may contribute to more accurate assessments of attention and hyperactivity/impulsivity problems in adults.

**Voluntary Nature of Participation.** Your participation is completely voluntary, and you may discontinue participation at any time without the loss of any benefits which would otherwise be provided to you. Declining to participate or to answer any specific question will have no adverse effect on any of your grades.

**Confidentiality.** All information relating to your performance during this study will be kept confidential. The online surveys are managed at the SurveyMonkey site in a secure, password-protected account that is accessible only by Dr. Canu and members of his research team. Your identifying information (such as name, email address) will be collected on this separate online form and will be used to facilitate payment or crediting. After you have completed this consent survey-- which registers your identifying information in its own database—you will be contacted via email within the next few days containing a hyperlink to the main study survey that contains the remainder of the questions. As such, your name will not be directly linked to your experimental survey responses. Your answers to survey questions will only be used by Dr. Canu or his laboratory team or colleagues for research purposes once the database is converted so that all data will be associated only with participant codes (instead of names or other identifying information). Your responses to survey questions will not be disclosed to your parent or significant other, should they participate, and you will similarly not have access to their responses. Confidentiality of all responses will be maintained to the degree permitted by the technology used (technically, no guarantees can be made regarding the interception of data sent via the Internet by any third parties). Your name will never be used in any publication or presentation of results. In fact, after data collection and credit distribution has been completed, your name and other identifying information will be deleted entirely from the database. In fact, after data collection and credit distribution has been completed, your name and other identifying information will be deleted entirely from the database, unless you specifically permit us to keep such information in order to contact you in the future regarding other possible research opportunities.

Contact Information. If you have any questions about this research project, before beginning the linked survey or any later time, you may contact Dr. Will Canu, Psychology Department, 107-A Smith-Wright Hall, Appalachian State University, 828-262-2711, canuwh@appstate.edu. If you have questions about my rights as a research volunteer, you may contact the Appalachian State University IRB administration at 287 Rivers St., Suite 232, J. E. Thomas Building, Boone, NC 28608, 828-262-2130, irb@appstate.edu.

**YOU HAVE HAD THE OPPORTUNITY TO READ THIS CONSENT FORM, AND YOU ARE PREPARED TO PARTICIPATE IN THIS PROJECT. IN ADDITION, YOU ACKNOWLEDGE THAT YOU ARE EIGHTEEN YEARS OF AGE OR OLDER (if you are under eighteen years of age, you should not continue).**

Yes                      No

The full name (first, middle, last) you have used for course registration this term is (this will be used to facilitate course credit, as appropriate).

Your valid e-mail address is (used for contact regarding completion of the main survey form as well as subsequent payment or course credit):

[FOR NON-PSYCHOLOGY POOL PARTICIPANTS] Your valid mailing address (for payment) is:

The name of the person you would like us to contact regarding your childhood behavior (i.e., parent or other guardian) is:

How is this person related to you? (Parent, biological or adoptive, Legal Guardian or Foster Parent, Grandparent, Aunt or Uncle, Sibling, or Other)

The valid email address of this person is:

(if applicable to you) What is the first and last name of the person you would like us to contact regarding your CURRENT behavior? (i.e., a romantic partner) Ideally, this should be a person with whom you've lived with in the last six months. Therefore, this could be the same person you nominated to report on your childhood behaviors, but only if you have lived at home in the past six months. As stated previously, we will only be contacting a portion of these individuals to participate.

How is this person related to you? (Spouse or Domestic Partner, Boyfriend or Girlfriend or Significant Other, Roommate, Close Friend, Parent, biological or adoptive, Legal Guardian or Foster Parent, Grandparent, Aunt or Uncle, Sibling, or Other)

The valid email address of this person is:

The research team would like to be able to contact participants in this study at a later date regarding other opportunities to participate in research related to ADHD. You may signal your willingness to be contacted via email at a later date by selecting option 1 ("Yes") below. Doing so does not mean that you will necessarily be contacted, and also does not obligate you to participate if you are contacted. If you select this option, your name and contact information and only a numeric code indicating your ADHD status will be kept by Dr. Canu on a secure computer. This database would be maintained indefinitely to enable potential long-term follow-up. Selecting option 2 ("No") in no way changes your opportunity to participate in and receive benefits (e.g., compensation/class credit) from the current study.

- Yes, I am willing to be contacted by the research team regarding future studies, should I qualify for their recruitment criteria. I understand that selecting yes does not obligate me to participate in any future study.
- No, I do not wish to be contacted by the research team regarding future studies.

Thank you for consenting to participate in our study. You will receive an email in the next 72 hours with instructions for participating in the main survey.

Appendix C  
Childhood Collateral Consent Form

**Purpose of Research.**

Previous studies have suggested that the symptoms of Attention-Deficit/Hyperactivity Disorder (ADHD) vary across the lifespan, but little research evidence exists regarding how ADHD manifests in emerging adults (such as college students). This study seeks to extend the current research base by examining a new set of diagnostic criteria in the college student population at Appalachian State University, among other universities, with the aim of establishing ADHD criteria that are age appropriate for this age group.

The online survey that you will complete will ask you to report a few details about yourself (such as age and education level) and to assess the extent to which ADHD and other problematic conduct (such as oppositional or delinquent behaviors) occurred for your child during his or her elementary-school years and within the past six months. You will also be asked about your typical parenting style and level of confidence in regards to parenting while raising your child. We are interested in your perspective, as a parent or guardian, because past research has shown that the opinions of children and their parents differ regarding these behaviors, and having both sets of data will help us to better evaluate our new, proposed set of adult ADHD criteria. The researchers also are examining whether ADHD symptoms and impairment differ between men and women. In addition, you will be asked about how you felt about your parenting skills and how you felt about being a parent while your child/student participant was growing up in your home.

Please note that your child has voluntarily provided us with your contact information in order for us to request your participation, thereby approving your taking part. We are seeking the participation of 1,200 students, total, and contacting approximately 400 parents nominated by these students with the aim of having an equal number of parents providing additional data regarding students with and without ADHD. Participation and answers given in this study, by students or their parents, should not be considered as “diagnostic.” Clinical diagnoses of ADHD and/or other disorders can only be made in more comprehensive, in-person assessments by qualified mental health or medical professionals.

**Duration of Participation.** Participation will take between 30 minutes and one hour. No follow-up procedures are planned.

**Risks to the Individual.** There are minimal foreseeable risks, either physical or psychological, associated with your participation in this study. The surveys you will complete relate to the constructs noted above, and relate to your demographic information (such as sex, ethnicity, age) and the behavior of another participant who has asked you to complete such information (usually this is a good friend, romantic partner, or sibling). At any time, you may choose to

skip questions that you think are as stressful; this will not affect compensation received for experiment completion. The data collection for this study is conducted online, and no method of transmission over the Internet, or method of electronic storage, is perfectly secure. Therefore, we cannot guarantee absolute security. However, we anticipate that the information being requested will put you at no greater risk than you would typically encounter during a routine psychological examination.

**Benefits to the Individual or Others.** While there is no direct benefit to you for participating in this study, the information derived from this project may have important societal benefits. The information gained may contribute to more accurate assessments of attention and hyperactivity/impulsivity problems in adults.

**Voluntary Nature of Participation.** Your participation is completely voluntary, and you may discontinue your participation at any time without the loss of any benefits, which would otherwise be provided to you.

**Confidentiality.** Confidentiality of all responses will be maintained to the degree permitted by the technology used (technically, no guarantees can be made regarding the interception of data sent via the Internet by any third parties). The online surveys are managed at the SurveyMonkey site in a secure, password-protected account that is accessible only by Dr. Canu and members of his research team.

Your identifying information (such as name, email address) will be collected for payment purposes following your consent to participate. You will then be prompted at the end of this consent to use an electronic hyperlink that connects you to a separate survey which includes the main questions we would like you to answer. This allows your name (and that of your child) to not be directly linked to your survey responses that have to do with your child's past or present behaviors or other potentially sensitive information.

Your answers to survey questions will only be used by Dr. Canu or his laboratory team or colleagues for research purposes once the database is converted so that all data will be associated only with participant codes (instead of names or other identifying information).

Your name will never be used in any publication or presentation of results. After data collection and credit distribution has been completed, your name and other identifying information will be deleted entirely from the database.

**Contact Information.** If you have any questions about this research project, you may contact Dr. Will Canu, Psychology Department, 107-A Smith-Wright Hall, Appalachian State University, 828-262-2711, canuwh@appstate.edu. Questions regarding the protection of human subjects may be addressed to the IRB Administrator, Research and Sponsored



Programs, Appalachian State University, Boone, NC 28608 (828) 262-2130, irb@appstate.edu

YOU HAVE HAD THE OPPORTUNITY TO READ THIS CONSENT FORM, AND YOU ARE PREPARED TO PARTICIPATE IN THIS PROJECT.

Yes                      No

What is your first and last name?

What is the student participant's (person for whom you are filling out this survey) first and last name?

What is your relation to the student participant? (Spouse or Domestic Partner, Boyfriend or Girlfriend or Significant Other, Roommate, Close Friend, Parent, biological or adoptive, Legal Guardian or Foster Parent, Grandparent, Aunt or Uncle, Sibling or Other)

After participating in the main survey, you will be contacted with information about where to pick up your financial compensation at Appalachian State University campus. If it will not be possible for you to pick up your payment, please provide the following information:

What is your physical address?

Street

City

State

Zip Code

### **Vita**

Anne Elizabeth Stevens was born in Pasadena, California to Ken and Elizabeth Stevens. She graduated from Davidson College in Davidson, North Carolina in May 2007. She was awarded a Bachelor of Science degree, majoring in psychology. After working in community mental health for four years, she entered Appalachian State University in the fall of 2011 to begin study toward a Master of Arts degree in Clinical Health Psychology. She was awarded this degree in May 2014, and will be continuing her education in the Clinical Psychology Ph.D. program at the University of Wyoming beginning in August 2014.