

Relationship Between Negative Emotion and ADHD Among College Males and Females

Tori B. Kearns, Ph.D.
East Georgia College

Joseph B. Ruebel, Psy.D.
Keller Psychological Associates, PA

Abstract

This study extends a body of research indicating a relationship between negative emotion and Attention Deficit-Hyperactivity Disorder (ADHD). Gender differences in the self-reporting of negative emotion among college students with ADHD were examined. Sixty-four college students (39 male, 25 female), with a diagnosis of ADHD, and 109 college students (37 male, 72 female), who were evaluated yet received no ADHD diagnosis, completed self-report measures of negative emotion. Results suggest that regardless of gender, students with an ADHD, Combined Type diagnosis reported significantly more negative emotion compared to students with no diagnosis. Gender differences were evident within both the ADHD, Combined Type and No Diagnosis groups, with females scoring significantly higher than males. This pattern continued to distinguish students with an ADHD, Combined Type diagnosis from those with no diagnosis within each gender.

Prevalence rates for Attention Deficit-Hyperactivity Disorder (ADHD) have varied across studies, but it is likely that between 3-7% of school-age children legitimately meet the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition – Text Revision (DSM-IV-TR) criteria for ADHD (American Psychiatric Association, 2000). Although ADHD is more frequently identified and diagnosed in males, actual gender ratios have varied widely across studies. Estimates from studies with children referred for an ADHD evaluation range from a low of 2:1 (males: females) to a high of 10:1, with an average ratio of 6:1 (Barkley, 1998). Quinn and Wigal (2004) postulate that the difference in prevalence rates is a result of referral bias (stemming from the overt and disruptive aggressive and antisocial behaviors observed more often among males). Faigel (1995) hypothesized that ADHD may be less noticeable and harder to diagnose in females because females are typically socialized to be quieter and less protesting than males.

Males and females with ADHD may also differ in the expression of symptoms associated with the disorder. Brown, Abramowitz, Dadan-Swain, Eckstrand, and Dulcan (as cited in Barkley, 1998) reported that among clinic-referred children with ADHD, females

were more socially withdrawn and were more likely to be anxious and depressed. Shea (1996) found that boys with clinically significant impulsivity ratings showed more negative and variable affect than a comparison group. Negative and variable mood in girls was associated with teacher ratings of ADHD but not necessarily with the predominantly hyperactive-impulsive version of ADHD. Studies with children identified as hyperactive at school have reported that girls tend to be rated by teachers as having fewer behavioral and conduct problems, but do not show fewer symptoms when measured in the laboratory (Barkley, 1998). Finally, in a comparison of 130 girls ages 6-17 with an ADHD diagnosis to 120 girls with no ADHD diagnosis, it was found that rates of major depression (17%), anxiety disorder (32%), and bipolar disorder (10%) were elevated among girls with the ADHD diagnosis (Biederman as cited in Barkley, 1998). Furthermore, while rates of negative emotion were comparable to rates reported for boys with ADHD in earlier studies, girls were nevertheless rated as less oppositional and as showing fewer conduct problems than the boys with ADHD.

In their meta-analytic review of research on gender differences in ADHD symptomatology, Gaub and

Carlson (1997) concluded that there were no significant gender differences on measures of impulsiveness, academic performance, or social functioning, yet girls were typically rated by observers as less hyperactive than boys and as expressing fewer “externalizing” symptoms, (such as aggression and conduct problems). Nadeau (2004) noted that girls with ADHD tend to be more hypersensitive to criticism. She described many adolescent girls with ADHD as compliant and seeking to conform to others’ expectations and not draw attention to themselves. She also proposed that hormonal fluctuations in females with ADHD may exacerbate symptoms of ADHD and contribute to dramatic mood swings, irritability, and emotional overreaction.

Quinn and Wigal (2004) conducted an online survey examining attitudes related to gender and ADHD. Their sample included adults in the general public, parents of children aged 6-17 years with ADHD, teachers with experience teaching a child with ADHD, and children aged 12-17 years with an ADHD diagnosis. A majority of the general public (58%) and teachers (82%) responded that ADHD is more common in boys. Comparatively, among teachers, 85% believed that girls are more likely to go undiagnosed, due primarily to the fact that girls do not “act out” (92%). A majority of both the general public and teachers reported that boys with ADHD struggle the most with behavioral and classroom problems, while girls suffer academic problems, inattention, and feelings of depression.

Far less is known about the prevalence of the disorder among adult males and females or how symptomatology may evolve and adjust with maturity. Results of one survey measuring symptoms of 720 adults against the DSM-IV ADHD criteria indicated an overall prevalence rate of 4.7% (Murphy & Barkley, 1996). Of those adults meeting DSM-IV criteria for ADHD, 2.5% were classified as Predominantly Hyperactive/Impulsive Type, 1.3% as Predominantly Inattentive Type, and 0.9% Combined Type. These results were quite similar to those reported by DuPaul, Weyandt, Schaugency, and Ota in their 1997 study with 700 college students (as cited in Barkley, 1998). Using DSM-IV criteria, results indicated that 2.5% of the college students classified themselves as Predominantly Inattentive Type, 0.9% as Combined Type, and 0.9% as Predominantly Hyperactive/Impulsive Type. Based upon these results, Barkley (1998) estimates that ADHD may be the second most common disability affecting college students and young adults, with prevalence rates between 3 and 5%.

Anywhere from 30-80% of children diagnosed with ADHD are likely to continue to display significant, age-inappropriate symptoms into adolescence (August, Stewart, & Holmes, as cited in Barkley, 1997; Barkley, Fischer, Edelbrock, & Smallish, 1991). Following a large-scale longitudinal study, Weiss and Hechtmann (as cited in Javorsky & Gussin, 1994) determined that approximately 66% of these children continued to display significant impairment related to symptoms of ADHD into adulthood. In addition, research suggests that the symptoms reported by adults diagnosed with ADHD are similar to those described by children and adolescents and their parents and teachers (Barkley, 1997). Barkley (1998) has proposed that the traditional DSM-IV criteria for ADHD may become increasingly less sensitive to the presence of dysfunction as clients age. This possibility reinforced a need to re-examine the ADHD criteria across the lifespan as well as the traditional view among professionals and the public that most children “grow out of” ADHD by adulthood. It is clear that this is not always the case, and there is a continued need in the research literature to document the difficulties associated with ADHD among adults.

Emotional Regulation

Research on the relationship between symptoms of ADHD and poor emotional regulation (Barkley, 1997, 1998; Martel, 2009; Ramirez et al., 1997) is growing. Children diagnosed with ADHD are frequently described as irritable, hostile, excitable, and generally emotionally hyper-responsive. Biederman, Faraone, Mick, Moore, and Lelon (1996) found that children with ADHD, as a group, were rated by researchers as having more symptoms of anxiety, depression/dysthymia, and low self-esteem.

Barkley (1997) discovered a link between a diminished ability to mentally represent and sustain internal information from prior event-emotion relationships (or contingencies) to problems with “reawakening” these emotional states when confronted with a particular situation. For example, when confronted with a stressful event, a person diagnosed with ADHD may not be able to recall his or her past efforts towards molding negative emotions into more positive ones. Barkley postulates that negative affective states including anger, frustration, sadness, anxiety, and guilt are more problematic for individuals diagnosed with ADHD because it is harder for them to create positive states through self-comforting, self-directed speech, and visual im-

agery. Without being able to engage in covert emotion regulation, there is very little to no delay between an event and the emotional response. In essence, Barkley is stating that the affective response to an event is less likely to undergo a period of contemplation, modification, and reframing in the individual with ADHD. This results in decreased affective self-control and an increase in the expression of negative affect. Wender (as cited in Ramirez et al., 1997) reported that there exists an emotional instability component in childhood ADHD, often noted as labile mood that usually continues into adulthood.

There are numerous studies which suggest that individuals diagnosed with ADHD in childhood are typically diagnosed with an accompanying, long-standing psychiatric condition. For instance, research by Szatmari, Offord, and Boyle (as cited in Barkley, 1998) suggests that up to 44% of children diagnosed with ADHD may have at least one other psychiatric diagnosis. In their review of epidemiologic studies of children with ADHD, Biederman, Newcorn, and Sprich (1991) concluded that approximately 25% also had an anxiety disorder, and that 15-75% had a mood disorder. Likewise, Lahey, Pelham, Schaughency, et al. (as cited in Biederman et al., 1991) found that children meeting DSM-III criteria for ADHD, Predominantly Inattentive Type reported higher rates of anxiety compared to children with ADHD, Combined Type. Biederman's studies at Massachusetts General Hospital suggest that between 20-30% of children diagnosed with ADHD have a major affective disorder (Barkley, 1997). While Jensen, Shervette, Xenakis, and Richters (as cited in Barkley, 1998) reported that nearly 49% of the children diagnosed with ADHD in their study had an anxiety or depressive disorder, or both. Barkley (1998) concluded that between 13-30% of children with ADHD also have a comorbid anxiety or mood disorder and 25% may develop major depression. Major Depression may be particularly high for individuals diagnosed with ADHD - Combined Type (Faraone, Biderman, Weber, and Russell, 1998).

Research examining the relationship between negative affect and symptoms of ADHD in adults is growing, but is still rather limited. From Barkley's Milwaukee follow-up study it was learned that young adults diagnosed with ADHD had higher rates of Major Depression (28% v. 12%) compared to a control group (Murphy & Barkley, 1996). 19-37% of clinic-referred adults diagnosed with ADHD noted prominent dys-

thymia. Barkley (1998) reported that approximately 24-43% of adults diagnosed with ADHD have also been diagnosed with Generalized Anxiety Disorder (GAD) and that 52% reported a history of being "overanxious." Several studies have established a link between Major Depression and ADHD, with comorbidity estimates ranging from 16-31% in the ADHD adult population (Biederman et al., 1996; Murphy & Barkley, 1996). Robin, Tzelepis, Bedway, Gilroy, and Sprague (1997) reported that adults diagnosed with ADHD, compared to adults with no ADHD diagnosis, were more pessimistic, emotional, withdrawn, and self-demeaning. The authors concluded that the adults with ADHD in their study had more difficulties regulating their emotions and managing behaviors related to those emotions.

Purpose of Study

A body of research exists demonstrating a relationship between poor emotional regulation (or impaired ability to create positive states through self-comforting, self-directed speech, and visual imagery) and ADHD in children; however, similar research among adults is sparse. Given that ADHD is recognized as a valid disorder among adults, and an increasing number of adults diagnosed with ADHD are pursuing a college education, it is becoming increasingly important to extend the body of research to this population. An area of growing interest is the impact of emotional factors on global functioning among adults with ADHD. For instance, it is known that individuals diagnosed with ADHD struggle more, on average, with meeting the demands of a high school curriculum (Barkley, 1998). One might infer that negative emotional factors associated with ADHD (operationally defined in the present study as a clinically significant score on either the College Adjustment Scales Anxiety scale and/or Depression scale, or the Attention-Deficit Scales for Adults Emotive scale) would continue to impact adults who further their education at the post-secondary level. Also, based on studies demonstrating gender differences in the expression of negative emotion in ADHD, it might also be inferred that college females with an ADHD diagnosis will be more affected by negative emotion. Thus, this study was not only designed to assess the relationship between negative emotion and ADHD within the college adult, but also the differential impact of negative emotion on adult females and males diagnosed with ADHD.

Study Questions

The following questions were addressed in the study:

1. Are self-reported levels of negative emotion different among groups of individuals who have ADHD, Combined Type, ADHD Predominantly Inattentive Type, or no diagnosis?
2. Are there significant gender differences with regard to negative emotion within each diagnostic group?
3. Does negative emotion continue to distinguish individuals with ADHD from those with no diagnosis within each gender?

Method

Participants

Data from ADHD evaluations conducted at the Regents Center for Learning Disorders at Georgia Southern University (RCLD at Georgia Southern) were used in the study. The study sample was comprised of 173 students (97 female and 76 male) evaluated at the Center between the years of 1999 and 2004. The students were accepted to either two-year or four-year institutions of higher learning within the University System of Georgia. Sixty-four students (25 female and 39 male) were diagnosed with ADHD (all subtypes) and 109 students (72 female and 37 male) received no diagnosis. Participant ages ranged from 18 to 55 years old with a mean of 22.5 ($SD = 6.5$). There was no significant difference in mean age across diagnosis categories, $F(2, 170) = .05, p < .05$. Of those students receiving ADHD diagnoses, 31 (12 female and 19 male) were classified as having the Predominantly Inattentive Type, while 33 (13 female and 20 male) were classified as having the Combined Type. None of the students in the current study were given a diagnosis of ADHD, Predominantly Hyperactive-Impulsive Type.

Setting

The Board of Regents of the University System of Georgia established three regional centers in 1993 that provide assessment, resources, and research related to students with learning disorders in the University System. The Centers are housed at Georgia Southern University, The University of Georgia, and Georgia State University. Each Center is responsible for serving designated colleges and universities within geographic

regions. The RCLD at Georgia Southern professional staff consists of two educational psychologists, a learning disabilities specialist, a liaison, a licensed psychologist, and a director.

Instruments

The measures featured in the current study are typically used to screen adults for symptoms of depression, anxiety, emotional over-reactivity, agitation, and lability. They were chosen to provide an estimate of negative emotion among the subjects in the study.

College Adjustment Scales (CAS). The CAS is a self-report inventory for use with college students ages 17 through 65 years old. It provides measures of psychological distress, relationship conflict, low self-esteem, and school/career decision-making difficulties using 108 statements answered on a four-point scale. Two of the nine CAS scales were targeted for analysis of negative emotion in the current study. The Anxiety scale is a measure of common affective, cognitive, and physiological symptoms associated with clinical anxiety. It includes statements such as, "Sometimes I am so worried that my heart beats uncontrollably." The Depression scale is a measure of common symptoms associated with clinical depression. It includes statements like, "Lately, I have a hard time taking an interest in anything."

Attention-Deficit Scales for Adults (ADSA). The ADSA is a self-report measure that assesses current ADHD symptoms in adults ages 17 years and older. The scale is divided into two sets of subscales, Primary and Secondary. There are 54 items to be rated on a five-point scale ranging from "Never" to "Always." One of the secondary subscales, Emotive, was used as a measure of negative emotion in the current study. The Emotive scale assesses moodiness, tendency toward depression, and feelings of being easily overwhelmed by demands in life. It contains statements such as, "I get angry very easily."

Procedures

All participants completed packets of information containing screening instruments for academic and attentional problems, a case history, and consent forms allowing for the use of their test data for future research. Students also obtained vision and hearing screenings and supplied a copy of their most recent college academic transcript, a sample of their best writing effort, and copies of any past evaluations or pertinent

medical records. Upon completion and submission of their packets, students were scheduled for an initial interview (with the RCLD licensed psychologist) and the ADHD assessment. Following this initial day of testing, the participants' results were reviewed in a pre-staffing with the RCLD professional staff to determine what additional psychoeducational testing would be most appropriate. Some participants were given an ADHD diagnosis at this point while others received a diagnosis upon completion of psychoeducational testing. Students receiving no diagnosis completed the same testing process. All participants received a report of their psychoeducational evaluation results and were given the opportunity to participate in a feedback session to review the results with RCLD professional staff. To arrive at a diagnosis of ADHD, the RCLD utilized the following criteria:

1. Evidence of a history of symptoms of inattention and/or hyperactivity/-impulsivity from at least two independent sources (parents, teachers, physicians, clinicians) across multiple settings (school, home, work);
2. Documentation of current symptoms that meet at least six of nine of the DSM-IV-TR Inattention and/or Hyperactivity/Impulsivity criteria;
3. Evidence of both childhood and adult significant symptoms;
4. Clear evidence of interference with developmentally appropriate academic and/or social functioning;
5. Differential diagnosis with other disorders that may cause problems with inattention and/or hyperactivity (i.e. depression, anxiety, etc.).

The diagnostic instruments used in the ADHD assessment process included the Barkley ADHD Behavior Checklist for Adults (Murphy & Barkley, 1996), the Brown ADD Scales, the Integrated Visual and Auditory Continuous Performance Test (IVA), the Conner's Continuous Performance Test, the Wisconsin Card Sorting Task; Computer Version 4, and an interview with a licensed psychologist. A consensus regarding the diagnosis was reached in a meeting with the RCLD professional staff.

Results

To determine if gender was evenly distributed within each diagnostic group, a chi-square test was conducted. Results indicated that gender was not evenly distributed across the three groups of participants, $X^2(2, N = 173) = 11.93, p < .01, \phi^2 = .26$ (small effect). Visual inspection of the contingency table clearly indicated that there were approximately twice as many females as males in the No Diagnosis group (72 females compared to 37 males). The gender distribution was more even in the ADHD, Predominantly Inattentive Type (12 female and 19 male) and ADHD, Combined Type (13 female and 20 male) groups. Thus it appears that female participants in this study were less likely than males to receive an ADHD diagnosis; however, among those receiving an ADHD diagnosis, there were no significant gender differences related to the diagnostic category.

To determine if the self-report of negative emotion among college students diagnosed with ADHD differed significantly from that of college students without an ADHD diagnosis, a 3 x 3 analysis of variance (ANOVA) with the three measures of negative emotion and three diagnostic groups was conducted. Table 1 presents the means and standard deviations for the three measures of negative emotion for each of the diagnostic groups. Results indicated a significant effect for the ADSA Emotive scale, $F(2, 170) = 7.29, p < .01, \eta_p^2 = .07$ (medium effect). Tukey post hoc comparisons showed that the mean ADSA Emotive score for the ADHD, Combined Type group ($M = 66.6, SD = 11.32$) was significantly higher than the mean score for the No Diagnosis group ($M = 57.9, SD = 11.60$). The mean ADSA Emotive score for the ADHD, Combined Type group was not significantly different from the mean of the ADHD, Predominantly Inattentive Type group ($M = 60.6, SD = 11.54$).

To examine gender differences in negative emotion within each diagnosis, three 3 x 2 (negative emotion measures x gender) analyses of variance were conducted, one for each of the three diagnosis groups. Table 2 presents the mean scores for the three measures of negative emotion among participants in each group, separated by gender. Within the ADHD, Predominantly Inattentive Type group, no significant gender differences were found for the three measures of negative emotion. For the ADHD, Combined Type group, females scored significantly higher than males

on both the ADSA Emotive scale, $F(1, 31) = 5.30$, $p < .05$, $\eta_p^2 = .14$ (large effect) and CAS Anxiety scale, $F(1, 31) = 4.71$, $p < .05$, $\eta_p^2 = .13$ (medium effect). Likewise, for the No Diagnosis group, females scored significantly higher than males on both the ADSA Emotive scale, $F(1, 107) = 8.38$, $p < .01$, $\eta_p^2 = .07$ (medium effect), and CAS Anxiety scale, $F(1, 107) = 8.19$, $p < .01$, $\eta_p^2 = .07$ (medium effect).

Mean scores on measures of negative emotion across diagnosis groups within each gender are presented in Table 3. For female participants, a significant effect for the ADSA Emotive scale was found, $F(2,$

$94) = 7.33$, $p < .01$, $\eta_p^2 = .13$ (medium effect). Post hoc Tukey tests indicated that females with an ADHD, Combined Type diagnosis scored significantly higher on the ADSA Emotive scale as compared to females with no diagnosis. For males, a significant effect was also found for the ADSA Emotive scale, $F(2, 73) = 4.21$, $p < .05$, $\eta_p^2 = .10$ (medium effect). Post hoc Tukey tests indicated that, as with females, males with an ADHD, Combined Type diagnosis scored significantly higher on the ADSA Emotive scale than males with no diagnosis.

Table 1

Measures of Negative Emotion across Diagnosis Groups

Measure	ADHD Predominantly Inattentive Type	Diagnosis Group ADHD, Combined Type	No Diagnosis
	Mean (SD)	Mean (SD)	Mean (SD)
ADSA Emotive	60.58 (11.54)	66.64 ^a (11.32)	57.91 ^a (11.60)
CAS Anxiety	54.00 (9.07)	54.79 (9.67)	53.80 (8.43)
CAS Depression	51.61 (8.33)	53.70 (8.78)	51.36 (8.37)

Means with the same superscript letter are significantly different, $p < .05$.

Table 2

Gender Differences on Measures of Negative Emotion within Groups

Group	ADSA Emotive	CAS Anxiety	CAS Depression
	Mean (SD)	Mean (SD)	Mean (SD)
ADHD, Inattentive			
Females	63.25 (9.99)	56.58 (8.39)	54.75 (7.55)
Males	58.89 (12.37)	52.37 (9.31)	53.92 (7.68)
ADHD, Combined			
Females	71.92 ^a (10.36)	59.08 ^b (8.24)	53.92 (7.68)
Males	63.20 ^a (10.80)	52.00 ^b (9.68)	53.55 (9.63)
No Diagnosis			
Females	60.14 ^c (10.30)	55.40 ^d (7.79)	52.31 (8.33)
Males	53.57 ^c (12.84)	50.68 ^d (8.85)	49.51 (8.25)

Means with the same superscript letter are significantly different, $p < .05$.

Table 3

Measures of Negative Emotion across Diagnosis x Gender

Gender	ADSA Emotive Mean (SD)	CAS Anxiety Mean (SD)	CAS Depression Mean (SD)
<i>Females</i>			
ADHD, Inattentive	63.25 (9.99)	56.58 (8.39)	54.75 (7.55)
ADHD, Combined	71.92 (10.36) ^a	59.08 (8.24)	53.92 (7.68)
No Diagnosis	60.14 (10.30) ^a	55.40 (7.79)	52.31 (8.33)
<i>Males</i>			
ADHD, Inattentive	58.89 (12.37)	52.37 (9.31)	49.63 (8.37)
ADHD, Combined	63.20 (10.80) ^b	52.00 (9.68)	53.55 (9.63)
No Diagnosis	53.57 (12.84) ^b	50.68 (8.85)	49.51 (8.25)

Means with the same superscript letter are significantly different, $p < .05$.

Discussion

The current exploratory study was conducted to extend the body of research indicating a relationship between negative emotion and ADHD among children and youth to the adult ADHD population. It was also designed to examine differences in negative emotion between adult females and males with an ADHD (any type) diagnosis. A primary goal of the study was to generate useful information that could ultimately be applied to a model of comprehensive treatment and services, at the college level, for adults with ADHD.

Using a large sample of college students tested at a regional learning disorders center, several notable outcomes were observed. Those outcomes were namely that: (a) adults (male and female) with an ADHD, Combined Type diagnosis showed higher self-reported levels of emotionality (based on the ADSA Emotive scale) compared to adults in a No Diagnosis group; however, adults with an ADHD, Predominantly Inattentive Type diagnosis were virtually indistinguishable from the aforementioned groups based on the factor of negative emotion alone; (b) females self-reported higher levels of emotionality (ADSA Emotive) and anxiety (CAS Anxiety) than males in both the ADHD, Combined Type and No Diagnosis groups; yet, there were no gender differences on these measures of negative emotion within the ADHD, Predominantly Inattentive Type group, and; (c) female participants in the ADHD Combined Type group rated themselves significantly higher on emotionality (ADSA Emotive) than females in the No Diagnosis group; whereas, females in the ADHD, Predominantly Inattentive group had ratings of emotionality (ADSA Emotive) that fell between those of the aforementioned groups, and were not significantly different from either group. Male participants showed a similar pattern to females. Males in the ADHD, Combined Type group rated themselves significantly higher in emotionality (ADSA Emotive) than males in the No Diagnosis group.

The first and third findings, considered together, indicate that regardless of gender, the adults with an ADHD, Combined Type diagnosis rated themselves significantly higher on emotionality (ADSA Emotive) than adults receiving no diagnosis. This finding is supported by prior research suggesting that ADHD symptoms are associated with decreased affective self-control, thereby causing increased expression of negative emotion (Barkley, 1997, 1998; Ramirez et

al., 1997). Yet, the results of the current study place a new twist on this idea. The individuals with an ADHD, Predominantly Inattentive Type diagnosis were not found to be significantly different from individuals receiving no diagnosis on the variable of emotionality (ADSA Emotive). Thus, in terms of negative emotion, a distinction needs to be made between adults with an ADHD, Combined Type and ADHD, Predominantly Inattentive Type diagnosis. The latter group appears to be less affected by emotionality and less distinguishable from a non-ADHD population on the factor of negative emotion. One might question whether this is attributable to a decreased awareness of emotionally charged stimuli in the environment among individuals in the ADHD, Predominantly Inattentive group. Or, perhaps, these individuals have under-aroused emotional centers in the brain, leading to less emotional expression. These differences, and their causes, should be further investigated in future research.

The second finding shows clear gender differences on two factors of negative emotion, namely emotionality and anxiety. Females in the ADHD, Combined Type and No Diagnosis groups rated themselves higher on both domains, than males in the ADHD, Combined Type and No Diagnosis groups, respectively. This finding lends support to reports that emotional symptoms associated with ADHD are exacerbated by social and physiological factors for females (Nadeau, 2004). Nadeau further speculates that societal expectations that females will be the nurturers and supporters leaves them devoid of much needed nurturing and support for their own issues. Emotional stress coupled with an inadequate support system might be said to result in a decreased sense of control over one's problems and an increased expression of emotionality or anxiety.

An explanation for the lack of gender difference on measures of negative emotion in the ADHD, Predominantly Inattentive Type group is not readily apparent. One might surmise that an emotional pattern characterized by under-arousal and introversion, which is more commonly associated with this group, is manifested similarly in males and females. In other words, females in the ADHD, Predominantly Inattentive Type group are no more likely to express negative emotion than males because they are, by the nature of their disorder, less given to impulsive reactionary behaviors. It might be further posited that both males and females in the Predominantly Inattentive Type group have symptoms of the disorder which are less noticeable by others and

perhaps even by them. For instance, an individual may be more likely to self-report hyper-emotionality if they frequently get into fights rather than if they frequently withdraw from uncomfortable situations.

When comparing females across all diagnostic groups, those in the ADHD, Combined Type group reported significantly higher emotionality on the ADSA Emotive scale than the No Diagnosis group of females. No other indicators of negative emotion were found to be significantly different among female groups. The same pattern was found for males across diagnostic groups. Based on these results, it might be concluded that both males and females in the ADHD, Combined Type groups exhibited higher levels of emotionality than males and females without a diagnosis, but not higher levels of anxiety or depression. Once again, the peculiarity in this investigation is the ADHD, Predominantly Inattentive group. Females who were predominantly inattentive were not found to differ significantly on any indicator of negative emotion from females in the other two groups. The same was true for males in the ADHD, Predominantly Inattentive Type group who did not differ significantly on measures of negative emotion from the males in the other two groups.

Conclusion

There appears to be something central to having both inattentive and hyperactive-impulsive symptoms that makes the expression of negative emotion more salient than just having inattentive symptoms alone or no ADHD symptoms at all. To understand this finding, one might return to the view that individuals with an ADHD diagnosis tend to exhibit greater difficulty with emotional regulation as a function of a weak ability to create positive states of mind (Barkley, 1997, 1998; Ramirez et al., 1997). It follows logically, that the group exhibiting the most extensive ADHD symptoms, the ADHD, Combined Type group, would exhibit the most problems with emotional regulation, and have the highest ratings of emotionality (ADSA Emotive). Members of the ADHD, Predominantly Inattentive Type group had the second highest ratings of emotionality; however, this was not significantly different from individuals with both hyperactive-impulsive and inattentive symptoms or from individuals with no diagnosis at all. As might have been predicted *a priori*, individuals with no diagnosis had the lowest ratings of emotionality.

It is difficult to rule out the impact of underlying psychiatric factors as contributing to symptoms consistent with ADHD. For example, could retrospective ratings of ADHD symptoms be under-reported, especially for females? Consistent with prior research, boys are typically rated as exhibiting more problematic behaviors and symptoms that are consistent with ADHD. This could then lead to widespread under-diagnosis of ADHD in adult females, since evidence of an early history of symptoms in childhood is an important criterion. Certainly, in the sample used in the current study, a notable difference between numbers of females and males receiving no diagnosis was evident. The No Diagnosis group included approximately twice as many females as males. This suggests the possibility of a bias in diagnostic procedures. These procedures may need to be revised to increase sensitivity to ADHD symptoms that may be more commonly seen with females. It also suggests that adults may need to become better educated about the manifestation of common ADHD symptoms in young females (e.g. inattention, withdrawal) to ensure that females with the disorder do not fall through the cracks and miss the services they may need to succeed academically.

The study results suggest that postsecondary disability service providers should pay particular attention to accommodations and treatment recommendations for individuals with a diagnosis of ADHD-Combined Type. Although such decisions must be based on individual need, the greater risk of impaired emotion regulation for members of this group indicate that direct instruction in creating positive states (e.g. ways of self-comforting, reframing through self-directed speech, and use of visual imagery to cope with intense emotional stress) may be of critical importance. In addition to negotiating appropriate accommodations for inattention and impulsivity for the classroom and test taking, encouraging utilization of tutoring services, and academic counseling that incorporates direct instruction in creating positive emotional states, a DSP might also consider recommending participation in a stress management counseling group.

The study further suggests that within the ADHD-Combined Type group and among students reporting ADHD symptoms but receiving no diagnosis, females are more apt than males to report greater levels of emotionality and anxiety. Thus, whether conducting an assessment in-house or referring to an appropriately licensed examiner, a rule out of co-morbid anxiety

symptoms should be made. Also, because of factors that might cause symptoms that mimic the inattention, poor concentration, and focus associated with ADHD (e.g. stress from childcare or other caregiver responsibilities, poor academic preparation, or poor health, etc.), other psychiatric, social, and health conditions should be explored. In the current study, females overwhelmingly received no diagnosis after reporting ADHD symptoms and academic problems. Based on this noticeable difference, it may prove useful to have a counseling group targeted specifically to women experiencing inattention, poor concentration, and/or impulsivity.

Also suggested by the current study results is the need to use more extensive measures of negative emotion in future research. The CAS Depression scale did not significantly differentiate any of the groups despite empirical evidence that individuals with ADHD often have symptoms consistent with a depressive disorder as well. Similarly, the CAS Anxiety scale no longer differentiated individuals with ADHD, Combined Type from those with no diagnosis when differences within each gender (e.g. female vs. female) were examined. While there was a statistically significant difference detected between males and females, the data likely had limited clinical significance. When a closer look was taken at the data, it was clear that the CAS Anxiety scores that were found to be significantly different between diagnostic categories (and between males and females) did not even meet the threshold considered to be “borderline” significant as established in the CAS manual (T-score of 60). Thus, although the scores are statistically different, neither would qualify as even “mild” anxiety.

Lastly, none of the 173 individuals included in the sample received a diagnosis of ADHD, Predominantly Hyperactive-Impulsive Type. Nevertheless, it is possible that students with predominantly hyperactive and impulsive symptoms are less likely to seek testing at the regional center since poor academic performance among adult students with ADHD may be more aptly attributed to problems with inattention rather than activity level. It would be interesting to examine the relationship between negative emotion and individuals exhibiting mostly hyperactive-impulsive ADHD symptoms. For instance, would individuals who are predominantly hyperactive and impulsive rate themselves higher on measures of negative emotion than individuals with both hyperactive-impulsive and

inattentive symptoms? Would they rate themselves significantly higher on measures of emotionality (e.g. ADSA Emotive scale) than individuals with an ADHD, Predominantly Inattentive Type diagnosis? The current study shows that the expression of negative emotion appears to vary by the specific type of ADHD diagnosis, and extending this research to include adult individuals with an ADHD, Predominantly Hyperactive-Impulsive Type diagnosis would more broadly define the relationship between negative emotion and ADHD in adults.

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About the Authors

Tori Kearns received her BA degree in psychology from Swarthmore College and Ph.D. from the University of South Carolina. Her experience includes serving as the liaison for The Regents Center for Learning Disorders at Georgia Southern University. She is currently an assistant professor of psychology and counselor for East Georgia College. Her research interests include postsecondary LD assessment and the identification of African American students with learning disorders. She can be reached by email at: tkearns@ega.edu

Jay Ruebel received his BA degree in psychology from The University of Texas at Austin and Psy.D. from Indiana State University in Terre Haute, Indiana. His experience includes working as a professor at Georgia Southern University and serving as the Psychologist for the RCLD at Georgia Southern. Dr. Ruebel currently maintains a thriving private practice in Fort Worth, Texas where he sees children, adolescents, and adults. His treatment interests include ADHD, anxiety disorders (particularly Obsessive-Compulsive Disorder), and depression. He can be reached by email at: drjay@kellerpsych.com