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# Exploring The Relationships Among ADHD, Generalized Anxiety Disorder, and Emotion Regulation

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EXPLORING THE RELATIONSHIPS AMONG ADHD, GENERALIZED ANXIETY DISORDER, AND EMOTION REGULATION

by

ANNA SHEA HALL

(Under the Direction of Dorthie Cross)

## ABSTRACT

This study investigated the relationships among Attention-Deficit Hyperactivity Disorder (ADHD) symptoms and common comorbid struggles for clients, including Generalized Anxiety Disorder (GAD) symptoms, and executive functions, especially emotion regulation. ADHD and GAD are prevalent mental health conditions, are commonly comorbid with each other, and are both correlated with relative deficits in executive functions. Executive functions comprise higher-order cognitive processes like planning, inhibition, initiation, and monitoring, as well as emotion regulation. Prior research established connections among ADHD symptoms, GAD symptoms, and emotion regulation but did not examine which specific facets of emotion regulation were most relevant. The current study aimed to replicate previous research by examining the relationships among ADHD, GAD, and emotion regulation and extend it by exploring the specific facets of emotion regulation implicated, particularly for ADHD. Two hundred twenty-two adults (*M* age = 25.17, *SD* = 8.81) from a university student population and online forums completed an online survey of current ADHD and GAD symptoms, executive functions, and emotion regulation. Results showed that ADHD and GAD symptoms correlated positively with each other and with deficits in executive functions and emotion regulation. ADHD symptoms correlated positively with all facets of emotion regulation difficulties, but there were significant differences across the facets in the magnitudes of those correlations. The implications of this research may be informative for researchers, psychologists, and other mental health professionals focused on ADHD and GAD by enhancing the relevance of therapeutic strategies for clients with these diagnoses. By shedding light on the intricate relationships between ADHD, GAD, executive functions, and emotion regulation, the study

findings may provide insights that could guide effective design and implementation of emotion regulation-based interventions for clients with ADHD.

INDEX WORDS: Attention-Deficit/Hyperactivity Disorder, Generalized Anxiety Disorder, Emotion regulation, Emotion dysregulation, Executive function, Cognitive control, comorbidities

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ANNA SHEA HALL

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COLLEGE OF BEHAVIORAL AND SOCIAL SCIENCES

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# CHAPTER 1

# INTRODUCTION

## Rationale

This study examined the relationships among Attention-Deficit Hyperactivity Disorder (ADHD) symptoms, Generalized Anxiety Disorder (GAD) symptoms, executive functioning, and facets of emotion regulation in a sample of university students and adults recruited from social media. The global rate of ADHD in children and adolescents varies, but it is estimated to be between 5% and 10% (Song et al., 2021). ADHD persists across the lifespan, thus enduring throughout childhood and through adulthood. Though it may change in presentation and disabling symptomatology, ADHD does not disappear or cure itself as these children and adolescents become older (Martel et al., 2016; Wilens & Spencer, 2010). ADHD is prevalent in adults, occurring in 6% of college students and 4% of adults in general in the United States (Hotez et al., 2022; Kessler et al., 2006), though prevalence rates vary across the world, ranging from 2% to 5% (Ayano et al., 2023). Because ADHD persists throughout the lifespan, it has an enduring impact as well.

Because ADHD is a neurodevelopmental disorder, it has a broad range of impacts on development and daily life, such as social and occupational dysfunction, impaired sleep, and even motor vehicle collision risk (Brunkhorst-Kanaan et al., 2021; Kirov & Brand, 2014; Laugesen et al., 2017). In a study of college students, participants with ADHD exhibited less academic confidence, received lower grades, and were more concerned about the health of their social relationships than were their peers (Green & Rabiner, 2012). In adults in general, the disorder is frequently underdiagnosed and may remain undetected due to informal social and environmental supports (Rivas-Vazquez et al., 2023), but symptoms can and do still interfere most notably with occupational duties through impulsivity, procrastination, and low frustration tolerance (Oguchi et al., 2021).

Additionally, ADHD is commonly comorbid with other disorders, including Generalized Anxiety Disorder (GAD; Elwin et al., 2020; Gnanavel et al., 2019). The rate of comorbidity between ADHD and GAD ranges between 15% and 35% (Busch et al., 2002; Gnanavel et al., 2019; Jensen et al., 2001). One

contributor to comorbidity may be the shared influence of executive function deficits, including not only executive functions like working memory, but also emotion regulation (Groves et al., 2020; Jarrett, 2016).

Though pharmaceutical interventions are the most common treatments offered to people with ADHD, there are empirically supported psychological interventions for ADHD based on a cognitive behavioral model that addresses not only concepts like organization and time management, but also anxiety and depression (Cuijpers et al., 2014; Lambez et al., 2019; Oud et al., 2019). Clients with these diagnoses may also benefit from added treatment components that specifically target emotion regulation (Bodalski et al., 2018; Mennin et al., 2002; Mennin, 2004); however, emotion regulation is a multi-faceted construct, and different facets may have different relevance to ADHD.

Within emotion regulation, there are different facets, so that a person with deficits in emotion regulation may experience problems in one or more of a wide range of areas, such as denial of or negative reactions to one's own negative emotions, deficits in awareness of and clarity about emotions, deficits in impulse control and difficulty engaging in goal-directed behavior when experiencing negative emotions, and lack of confidence in one's ability to access or benefit from strategies to manage negative emotions (Buchanan, 2021). Identifying specific facets of emotion regulation may help clinicians develop specific strategies and treatment plans to better help clients with ADHD and GAD.

This research holds important implications for clinicians and researchers by illuminating the relationships among ADHD, GAD, executive functions, and facets of emotion regulation. By examining the relationship among these variables, the research contributes to advancing therapeutic strategies, particularly for clients with ADHD who may benefit from interventions targeting emotion regulation. Understanding the specific facets of emotion regulation that are most associated with ADHD symptoms may help clinicians better tailor interventions for clients with ADHD.

## Literature Review

### *Attention Deficit Hyperactivity Disorder*

ADHD is a neurodevelopmental disorder that is defined by consistently impaired levels of attention, disorganization, hyperactivity, and impulsivity that substantially interfere with social, academic,

and occupational functioning (American Psychiatric Association (APA); 2022; Koutsoklenis & Honkasilta, 2023). ADHD has three presentations: inattentive, hyperactive-impulsive, and combination (both inattentive and hyperactive-impulsive); it also has three severity levels: mild, moderate, and severe. To confirm diagnosis in an individual under 17 years old, at least 6 criteria must be met, and for individuals over 17 years old, at least 5 criteria must be met. For all persons, criteria must be met for a minimum of 6 months, in addition to symptoms being directly inhibitory of two or more environments in which daily functioning occurs (i.e., home life, occupational, educational, social, and others; APA, 2022).

ADHD has a diverse and variable etiology, but it is not fully understood. One of the strongest, most supported contributing causes to ADHD is heritability, but there is no single cause of the disorder (Faraone & Larsson, 2018; Kian et al., 2022; Núñez-Jaramillo et al., 2021; Schachar, 2014; Thapar et al., 2011). Other studies have also concluded that social, perinatal, and gestational environmental factors play a part but remain heavily confounded (Castellanos & Rapoport, 1992; Núñez-Jaramillo et al., 2021). Whether due to genetic heritability or factors in the social or biological environment, ADHD is strongly associated with deficits in executive functions, which are the mental processes that allow for higher-order cognitive functions like planning, inhibition, initiation, and monitoring, as well as emotion regulation (Ferguson et al., 2021; Jarrett, 2016).

Previous research demonstrates links among executive functions broadly, emotion regulation specifically, ADHD symptoms, and anxiety symptoms (Jarrett, 2016). More specifically, besides ADHD and anxiety being commonly comorbid (Quenneville et al., 2022), both ADHD and anxiety are known to be associated with relative deficits in executive functions, including emotion regulation (Cisler & Olatunji, 2012; Gkintoni & Ortiz, 2023; Godoy et al., 2023; Jarrett, 2016). According to Jarett et al. (2016), ADHD, anxiety, and executive functioning deficits were all positively related to deficits of emotion regulation. The relationships among ADHD, anxiety, executive functions, and emotion regulation are strongly supported, bolstered by consistent empirical findings, and commonly accepted theories as to why these relationships occur (Barkley, 1997; Cisler & Olatunji, 2012; Gkintoni & Ortiz, 2023; Godoy et al., 2023). Deficits in executive functions, including emotion regulation, may partly

explain the common comorbidity between ADHD and anxiety disorders like GAD, a mental health disorder characterized by excessive worry (APA, 2022).

### *Generalized Anxiety Disorder*

In the literature, research studies commonly refer to Generalized Anxiety Disorder, when it is a topic of study, as anxiety within the study. For the purposes of alignment with the current literature, this study will use the same method, referring to Generalized Anxiety Disorder as either GAD or anxiety.

GAD is an anxiety disorder commonly classified as excessive anxiety and worry for at least 6 months, occurring more days than not, about a variety of events or activities, in which the person finds it difficult to control the worry. The diagnostic criteria include difficulty concentrating, irritability, restlessness/feeling keyed up or on edge, muscle tension, finding it difficult to control the worry, and being easily fatigued. For children, only one criterion must be met, and for adults, at least three criteria must be met (APA, 2022).

GAD is the least successfully treated anxiety disorder and has the worst prognosis outcomes across all age groups (Newman et al., 2013; Probst et al., 2022). Though anxiety can appear at any time and does not always persist across the lifespan, there is a 40% to 60% chance that it will persist throughout the lifespan if symptoms are present and interfere with daily functioning (Hovenkamp-Hermelink et al., 2021; Mishra & Varma, 2023). Anxiety disorders in children are estimated to be between 4% and 20% (Bhatia & Goyal, 2018). An estimated 25% of adolescents experience anxiety in a clinically significant way, and 6% of adolescents find that anxiety to persist into adulthood (Wang et al., 2017). Anxiety in a college student population depends on the population sampled but is found to range generally between 30% and 45% (Kim et al., 2021; Lee et al., 2021; Martínez-Líbano et al., 2023). In adults in general, anxiety is present in roughly 34% of the population at any given time (Bandelow & Michaelis, 2015), but over the course of a lifetime, about 21% of people will experience clinically significant GAD (Patriquin & Mathew, 2017).

Anxiety is associated with difficulties in social, occupational, and academic functioning (Kuhney et al., 2021; Mazzone et al., 2007; Moitra et al., 2011; T. Thompson et al., 2019). In a study of college

students during the first year of the COVID-19 pandemic, researchers found that participants with high levels of general anxiety experienced lower levels of vitality (e.g., less energy, more exhaustion) and more learning problems compared to their low anxiety peers (Sahin & Tuna, 2022). Furthermore, adults in general seem to be impacted in a similar manner, but fatigue symptoms tend to present more intensely than younger age groups. In adults over 60 years old, fatigue symptoms decreased, as general worry about the state of world and community affairs increased (Correa & Brown, 2019). Across studies, individuals with GAD demonstrate statistically significant increases in levels of stress and sleep difficulties, alongside reductions in psycho-social functioning and life satisfaction, alongside impaired relationships, roles, and social interactions (Kavelaars et al., 2023).

Like ADHD, GAD has a varied etiology which includes genetic and environmental influences, such as history of trauma (Aktar et al., 2017; Ayazi et al., 2014; Fernandes & Osório, 2015; Gottschalk & Domschke, 2017; Koskinen & Hovatta, 2023; Patriquin & Mathew, 2017; Waszczuk et al., 2013). In addition, GAD is associated with deficits in executive functions, including emotion regulation (Gulpers et al., 2018; Jarrett, 2016).

### *ADHD and GAD*

There is no single direction of relationship between ADHD and GAD: GAD can interfere with attention, and ADHD can create problems that make a person anxious. The relationship between the two can vary based on individual clinical presentation and intensity of symptoms. In addition, both ADHD and GAD are impacted by deficits in executive functions (Ansari et al., 2008; Gulpers et al., 2018; Jarrett, 2016). Greater deficits in executive function are associated with more severe clinical presentations of ADHD or GAD alone and with greater likelihood of comorbidity of the two (Jarrett, 2016). Moreover, comorbidity is associated with worse diagnosis-related impairment than either ADHD or GAD alone (Manassis, 2007; Menghini et al., 2017). A study by Jarrett (2016) also found that having both diagnoses was associated with notable impairments in multiple domains of executive functioning, including emotion regulation.

### *Executive Functioning*

Executive function is also called "executive control" and "cognitive control" within the literature (Bell & Meza, 2020). For the purposes of being consistent with the literature, this study will use the term executive function. Executive function refers to a set of skills that includes high-level cognitive abilities including problem solving, working memory, inhibitory control, reasoning, planning, cognitive flexibility, and emotion regulation (Cristofori et al., 2019; Sira & Mateer, 2014). ADHD is associated with long-term deficits in executive functioning over the lifespan, including deficits in specific domains including working memory, planning, inhibitory control, and self-regulation (Martínez et al., 2016; Orm et al., 2022; Schachar et al., 2000; Thorell, 2007). Additionally, GAD (anxiety) has been linked to difficulties in executive functions, including decision making, inhibitory control, working memory, cognitive flexibility, and response inhibition (Ajilchi & Nejati, 2017; Dieckhaus et al., 2021; Rosa-Alcázar et al., 2021).

**Emotion Regulation.** Emotion regulation is a type of executive function that pertains to the conscious or unconscious processing of emotions, including monitoring, evaluating, managing, or modulating emotions' intensity, duration, and form (Kok, 2020). Emotion regulation consists of multiple facets, including recognition, awareness, clarity, acceptance, and inhibition/suppression (Anderson et al., 2021; Boden & Thompson, 2015; Buchanan, 2021; R. A. Thompson, 1994). Emotion recognition refers to the attribution of emotional states to yourself or others based on observed nonverbal cues (Bänziger, 2014). Relatedly, emotional awareness is the ability to attend to and notice one's own emotional experiences and their effects (Serrat, 2017), and emotional clarity refers to the ability to differentiate among one's emotions, such as sadness versus embarrassment (Butler et al., 2018). Emotion acceptance reflects an openness and non-judgmental stance toward one's emotions, especially negative emotions (Williams & Lynn, 2010). Emotion inhibition/suppression is defined as the ability to manage emotions, especially negative emotions, so that they do not interfere with goal-directed behavior (Popolo et al., 2014). Emotion regulation also includes one's awareness of and confidence in using strategies to manage emotions (Buchanan, 2021). Given that emotion regulation is a specific executive function that is

correlated with both ADHD and GAD symptomatology, it is possible that levels of emotion regulation vary based on intensity of ADHD and GAD symptoms (Beheshti et al., 2020; Corbisiero et al., 2012; Makovac et al., 2015).

**Emotion Regulation and ADHD.** Emotion regulation deficits are described as a common experience for people with ADHD, though they are not included in the official diagnostic criteria (APA, 2022; Astenvald et al., 2022). In children and adolescents with ADHD, it was found that, in addition to the diagnostic criteria, participants also experienced emotion regulation deficits (Graziano & Garcia, 2016; Sánchez et al., 2019). In studies of adults, Bodalski et al. (2018), Christiansen et al. (2019), Hirsch et al. (2018), and Jarrett (2016) all concluded that emotion regulation deficits (also referred to as emotion dysregulation) are core features of ADHD.

Consistent with the theory that executive function is an important explanatory factor in the comorbidity of ADHD with other psychological disorders such as anxiety and depression, researchers have found that emotion regulation deficits observed in ADHD may be partly due to a shared neural construct in the prefrontal cortex called the striato-amygdalo-medial prefrontal cortical network, as well as the ventromedial prefrontal cortex (vmPFC; Motzkin et al., 2015; Shaw et al., 2014; Suzuki & Tanaka, 2021). Consistent with deficits in these brain regions, ADHD and emotion regulation are both associated with reduced inhibition and greater impulse control difficulties, greater difficulty regulating both positive and negative affect, and greater interference with goal-directed behavior (Graziano & Garcia, 2016; Sánchez et al., 2019; Tarle et al., 2021).

Based on the findings described above, the aspects of emotion regulation that may be most related to ADHD include difficulty engaging in goal-directed behavior, impulse control difficulties, and limited access to emotion regulation strategies. These facets of emotion regulation are all closely related to the executive function deficits that are characteristic of ADHD, such as working memory, inhibitory control, and cognitive flexibility (Martínez et al., 2016; Orm et al., 2022; Schachar et al., 2000; Thorell, 2007).

**Emotion Regulation and Anxiety.** The relationship between anxiety and emotion regulation may be partly explained by the vmPFC, again, as well as the stress response system referred to as the

Hypothalamus-Pituitary-Adrenal (HPA) Axis (Motzkin et al., 2015; Suzuki & Tanaka, 2021). The vmPFC helps to regulate the stress response system by assessing situations and guiding appropriate emotional and behavioral reactions (Gainotti, 2021; Hiser & Koenigs, 2018; Majumdar et al., 2018). Through the lens of anxiety as a disorder, dysfunction in vmPFC-mediated executive functions can contribute to difficulties assessing and responding to stressors, leading to problems regulating emotions, including anxiety, causing inappropriate intensity and persistence of emotional, cognitive, and behavioral responses, such as fear and avoidance (Cisler et al., 2009; Grecucci et al., 2020).

Based on these findings, the aspects of emotion regulation that may be most related to anxiety include deficits in emotional awareness and clarity, nonacceptance of negative emotions, difficulty engaging in goal-directed behavior in the face of negative emotions, and limited awareness of or confidence in using alternative emotion regulation strategies (Ruan et al., 2023). These facets of emotion regulation are closely related to the executive functioning deficits present in anxiety, which include decision making, inhibitory control, working memory, and cognitive flexibility (Ajilchi & Nejati, 2017; Dieckhaus et al., 2021; Rosa-Alcázar et al., 2021).

## Current Study

### *Aims*

The current study aims to investigate the relationships among ADHD symptoms, GAD symptoms, executive functions, and facets of emotion regulation (a specific domain of executive function) in a sample of participants recruited from a higher education institution and through social media. I aim to replicate findings in previous studies (e.g., Jarrett, 2016) showing that ADHD symptoms, GAD symptoms, executive function deficits, and emotion regulation deficits are positively correlated. Prior research has not examined what subsets of emotion regulation are most associated with ADHD symptoms, so I aimed also to extend those findings by examining the specific facets of emotion regulation most associated with ADHD symptoms.

### *Hypotheses*

For the current study, two hypotheses were formed.

- Hypothesis 1: ADHD symptoms will be positively correlated with anxiety symptoms, deficits in executive functions, and difficulties in emotion regulation.
- Hypothesis 2: ADHD symptoms will be more strongly correlated with the difficulty engaging in goal-directed behavior, impulse control difficulties, and limited access to emotion regulation strategies facets of emotion regulation than with the nonacceptance of emotional responses, lack of emotional awareness, lack of emotional clarity facets.

# CHAPTER 2

# METHOD

## Study Design

The current study was based on a cross-sectional, correlational design in which a sample of adults recruited from a university and through social media platforms completed an anonymous online, self-report survey of their current ADHD symptoms, GAD symptoms, executive function difficulties, and emotion regulation difficulties, as well as health history and demographics. Participants were not aware of the specific study purposes, other than that the survey included questions about mental health, worry, focus, and coping. To detect moderate correlation effects ($r$ = .30) based on two-tailed correlations and 95% power, the study required recruiting a minimum number of 134 participants (G*Power; Faul et al., 2009).

## Participants

Participants were current undergraduate and graduate students at a large, public university in the Southeastern United States, as well as adults recruited from social media. Inclusion criteria encompassed individuals ages 18 or above who accessed the Qualtrics link and indicated on the Informed Consent page that they agreed to participate in the study. There were no other inclusion or exclusion criteria for participation. In total, 388 participants enrolled in the study, but responses from 166 were excluded from analyses due to incomplete data, survey discontinuation, or other indication of poor data quality. Responses from 222 participants were retained for study analyses.

The mean age of included participants was 25.17 ($SD$ = 8.31). Participants ranged from 18 to 68 years of age with the median age being 22. See Table 1 for further information regarding participant demographics.

**Table 1**

*Participant Demographics (N = 222)*

| Gender Identity | *N* (%) | Sexual Orientation[1] | *N* (%) | Race/Ethnicity[2] | *N* (%) |
|---|---|---|---|---|---|
| Cisgender women | 158 (71.2%) | Heterosexual | 122 (55.0%) | White | 153 (68.9%) |
| Cisgender men | 32 (14.4%) | Bisexual or pansexual | 57 (25.7%) | Black or African American | 31 (14.0%) |
| Nonbinary individuals | 24 (10.8%) | Lesbian or gay | 17 (7.7%) | Hispanic or Latino | 10 (4.5%) |
| Transgender men | 2 (0.9%) | Asexual | 8 (3.6%) | Asian, Native Hawaiian, or Pacific Islander | 4 (1.8%) |
| Transgender women | 1 (0.5%) | Self-described as "queer" | 5 (2.3%) | Biracial or Multiracial | 3 (1.4%) |
| Self-described | 2 (0.9%) | Self-described in another way | 7 (3.2%) | Middle Eastern or North African | 1 (0.5%) |
| Declined to disclose | 4 (1.8%) | Declined to disclose | 6 (2.7%) | Multiple selections | 18 (8.1%) |
| | | | | Declined to disclose | 2 (0.9%) |

[1] One participant self-described as "straight" so was included under *Heterosexual*.

[2] Seven participants self-described, and all did so in a way that fit one of the other options (e.g., "Northern European") so were included in those categories for the purpose of this table. Ten participants selected *Hispanic or Latino* alone, and three selected *Biracial or Multiracial* alone. The remaining 18 participants selected multiple options, with a majority including *Hispanic or Latino*—8 selected *Hispanic or Latino* in combination with *White* (one also selected *Biracial or Multiracial*) and 3 with *Black or African American*; 4 selected *Asian* and *White*; 2 selected *Black or African American* and *White* (one also selected *Biracial or Multiracial*); and one selected *American Indian or Alaska Native* and *White*.

### *Recruitment*

Participants were recruited in a few different ways. Some participants were recruited through a departmental Sona account (www.sona-systems.com/). On Sona, undergraduate college students can find a list of ongoing department research in which they can participate in exchange for course credit. In addition to recruiting through Sona, information about the study was shared via other, more targeted avenues to increase participation among a wider age range and among people likely to experience ADHD symptoms. To recruit more diverse participants, I distributed a virtual flier to student organizations focused on disability issues, upper-division undergraduate psychology classes, and other departments within the university, and I posted physical fliers across campus. In addition to working with departments and organizations within the university, I also recruited via social media platforms, including by posting to Reddit threads (with moderator approval) and sharing on Discord, Facebook, Instagram, Snapchat, Threads, and LinkedIn. See Appendix A for copies of recruitment materials and other recruitment information.

Descriptive statistics were run to investigate from where the included sample was recruited. Ninety-four (42.3%) participants were recruited from social media, mostly Instagram ($N$ = 37) and Reddit (various subreddits; see Appendix A) ($N$ = 31), 61 (27.5%) were recruited from Sona, 39 (17.6%) were recruited from upper division undergraduate courses, 13 (5.9%) were recruited via email (e.g., department or student organization newsletters), 3 (1.4%) were recruited from a physical flier on campus, and 12 (5.4%) were recruited via other means (e.g., learned about study from a friend or student organization). Of note, 70.1% of the excluded cases did not reach the end of the survey, so the majority of data on recruitment sources for those cases is missing.

## Materials and Measures

Participants were asked to complete self-report questionnaires of current ADHD symptoms, GAD symptoms, executive function deficits, and emotion regulation deficits, as well as a brief health history form and demographics form. See Appendix B for a copy of all study questionnaires.

### *Barkley Adult ADHD Rating Scale-IV (BAARS-IV)*

The BAARS-IV is a self-report questionnaire of current (over the past 6 months) ADHD symptoms in adults (Barkley, 2011a). Items are based on DSM-IV criteria, which are the same as DSM-5 criteria. It has 18 items spanning over subscales of inattention (9 items), hyperactivity (5 items), and impulsivity (4 items). The BAARS-IV includes an additional 9 items measuring sluggish cognitive tempo, but these items do not contribute to the other ADHD scales/subscales and will not be included in the current study. The assessment uses Likert type questions with anchors at *Never or rarely* (1), *Sometimes* (2), *Often* (3), and *Very often* (4).

The BAARS-IV generates a total score, as well as four subscale scores for dimensions of ADHD: inattention alone, hyperactivity alone, impulsivity alone, and hyperactivity and impulsivity together. The higher the scores, the more symptoms of ADHD the person has. For primary study analyses, BAARS-IV scores were analyzed as continuous data to avoid unnecessary data dichotomization and loss of values along the scale (Arkkelin, 2014).

In previous research, the BAARS-IV was found to be effective for evaluation of ADHD symptoms but is not a replacement for psychiatric or psychological methods of evaluation and diagnosis. The measure is generalizable to a variety of populations and is based on over 16 years of research and tested over a 1,200 normative sample of participants that varied on all demographic information. Cronbach's alpha was .92 for current ADHD symptoms and .95 for childhood symptoms with good interobserver agreement (.67 to .70) and a high test-retest reliability over a period of 2-3 weeks (.75 for current ADHD, .79 for childhood ADHD). The construct, criterion-related, convergent and discriminant, and multi-trait, multi-method validity of scales was established over a variety of analyses; the BAARS-IV was shown to be predictive of ADHD diagnosis over all presentations (Barkley, 2011a). See Table 2 for the internal consistencies of the BAARS-IV total and subscale scores for the current study.

**Table 2**

*Internal Consistencies for Study Variables*

| Scale/Subscale | Number of Items | Cronbach's Alpha |
|---|---|---|
| BAARS-IV Total | 18 | .91 |
| BAARS-IV Inattention | 9 | .90 |
| BAARS-IV Impulsivity | 5 | .71 |
| BAARS-IV Hyperactivity | 4 | .88 |
| BAARS-IV Impulsivity-Hyperactivity | 9 | .84 |
| GAD-7 Total | 7 | .89 |
| BDEBS Total | 89 | .98 |
| BDEFS Self-Management to Time | 21 | .96 |
| BDEFS Self-Organization and Problem Solving | 24 | .95 |
| BDEFS Self-Restraint | 19 | .92 |
| BDEFS Self-Motivation | 12 | .93 |
| BDEFS Self-Regulation of Emotion | 13 | .94 |
| DERS Nonacceptance of Emotional Responses | 6 | .94 |
| DERS Difficulty Engaging in Goal-Directed Behavior | 5 | .91 |
| DERS Impulse Control Difficulties | 6 | .91 |
| DERS Lack of Emotional Awareness | 6 | .88 |
| DERS Limited Access to Emotion Regulation Strategies | 8 | .91 |
| DERS Lack of Emotional Clarity | 5 | .86 |

***Generalized Anxiety Disorder-7 (GAD-7)***

The GAD-7 is a 7-item scale used for screening for GAD in adults and is modeled after DSM-IV criteria but is still considered a useful instrument because changes in the DSM-5 criteria were very minor (Locke & Shultz, 2015; Spitzer, 2006). It asks about symptoms and problems faced over the past two weeks that relate to common issues with anxiety with anchors at *Not at all* (0), *Several Days* (1), *More than Half the Days* (2), and *Nearly every day* (3).

GAD-7 scores are added together to create a single total score. Like with the BAARS-IV, scores will be analyzed primarily as continuous data for the purpose of correlation analyses, but for purposes of describing the sample, data will be dichotomized based on a clinical cutoff score (in addition to continuous means and standard deviations). There are two ways of scoring the questionnaire, the short form, described as GAD-2, sums the first two questions of the questionnaire, and the GAD-7 scoring method is a sum of all seven questions. With the scoring method GAD-2, the scores range from 0-2 defined as "no provisional diagnosis" [of anxiety], and 3-6 is considered "probable anxiety disorder".

Under the full GAD-7 scoring, the scores range from 0-7 is “no provisional diagnosis” [of anxiety], and a score of 8 or more is considered “probable anxiety disorder”. For the purpose of all data analysis and descriptives, the full GAD-7 scoring method was used. Scores vary on the GAD-7, from minimal to severe anxiety: 0-4 is Minimal Anxiety, 5-9 is Mild Anxiety, 10-14 is Moderate Anxiety, and a score greater than 15 is Severe Anxiety (Spitzer et al., 2006). A score of 8 or higher on the GAD-7 questionnaire represents a point in which probable causes for Generalized Anxiety Disorder can be identified with a sensitivity of 92% and a specificity of 72% (Spitzer et al., 2006), so this cutoff was used in the current study when dichotomizing data for sample descriptives. Previous research using the GAD-7 found good reliability (alphas between 0.895 and .92) and strong evidence of validity in both primary care and college student samples (Dhira et al., 2021; Spitzer et al., 2006). See Table 2 for the internal consistency of the GAD-7 total score for the current study.

***Barkley Deficits in Executive Functioning Scale (BDEFS)***

The BDEFS is a scale used to evaluate adults from 18 to 81 on executive functioning deficits in daily tasks (Barkley, 2011b). It is composed of both self-report and other-report forms. For the purposes of this study, only the self-report form was used. Special features in the self-report form include the adult ADHD risk index. An attention check was embedded in the questionnaire between questions 51 and 52.

There are a total of 89 items on the BDEFS, with the assessment using likert-type questions with anchors at *Never or Rarely (1)*, *Sometimes (2)*, *Often (3)*, and *Very Often (4)*. It contains five subscales: Self-Management to Time (21 items), Self-Organization/Problem Solving (24 items), Self-Restraint (19 items), Self-Motivation (12 items), and Self-Regulation of Emotion (13 items; Vélez-Pastrana et al., 2016). Scores are computed for all individual subscales as well as a total score. Higher scores indicate more severe deficits in executive functions. Scores from the BDEFS were processed as continuous data for correlation analyses.

The BDEFS has been validated across a wide age range, from 18 to 81. Cronbach’s alpha ranged from .91 to .96 across five scales with good interobserver agreement from .66 to .79, and a good test-retest reliability over an interval of 2-3 weeks that ranged from .62 to .90 across multiple scales and a

total score reliability of .84. Construct, criterion-related, convergent and discriminant, and multi-trait, multi-method validity was established over multiple analyses and correlations with other EF supported findings (Barkley, 2011b; Kamradt et al., 2021; Vélez-Pastrana et al., 2016). See Table 2 for internal consistencies of the BDEFS subscale scores for the current study.

***Difficulties in Emotion Regulation Scale (DERS)***

The DERS measures difficulties in emotion regulation skills (Gratz & Roemer, 2003). It is a 36-item self-report scale and includes six subscales: nonacceptance of emotional responses, difficulty engaging in goal-related behavior, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity. It is taken with Likert-type questions with anchors at *Almost Never* (1), *Sometimes* (2), *About half the time* (3), *Most of the time* (4), and *Almost Always* (5). The DERS generates a total score, in addition to 6 subscales, and the higher the score, the greater difficulties in emotion regulation (Gratz & Roemer, 2003). Like with the BDEFS, DERS scores were analyzed as continuous variables for the purpose of correlation and will not be dichotomized unless necessary for data descriptives. An attention check was embedded in the questionnaire between questions 22 and 23.

The DERS has been used and shown to be valid in undergraduate student samples and other samples of adults (Gratz & Roemer, 2004). The DERS shows good internal consistency (Hallion et al., 2018). Construct validity for the DERS ranged from good to excellent (Fowler et al., 2014). Criterion-related validity, convergent and discriminant, and multi-trait, multi-method validity are all established and documented as valid (Gratz & Roemer, 2004; Hallion et al., 2018). See Table 2 for internal consistencies for the DERS subscale scores for the current study.

***Health History Inventory***

This is an 11-item self-report inventory based on an inventory developed for a previous study I conducted on ADHD and creativity (Hall, 2022). Participants were asked about previous diagnoses of ADHD, GAD, learning disorders related to executive function, other learning disorders, or other anxiety or mood disorders. Participants were also asked if they were prescribed medication for any of the mental

health conditions they indicated. An additional item asking about caffeine intake was also included. Data collected from the health history inventory were used primarily for exploratory purposes and were not reported in current study analyses.

### *Demographics Form*

The demographics form is a 7-item self-report questionnaire of common demographics information sourced from previous studies conducted in the faculty member's lab. It includes common items such as age, gender identification, racial and ethnic identification. In addition, it also includes questions about participant's primary location descriptors (rural, suburban, and urban), as well as questions about levels of parental education.

### *Survey Experiences Form*

At the end of the survey, three additional questions were presented: (1) A survey link source question ("How did you learn about this study?"), (2) a study purpose question ("What do you think is the purpose of this study?"), and (3) a self-rating of seriousness/effort while completing the survey. The seriousness item was adapted from Aust et al. (2013).

## Procedure

### *Recruitment Timeline*

The study start date for data collection on Qualtrics began on November 15th, 2023, when I received approval from the Institutional Review Board. Initial data collection was focused on social media, upper division undergraduate courses, physical fliers, and departmental emails. Data collection via the Sona platform through Georgia Southern University had already closed for the fall, so data collection via that route began on January 10th, 2024. Though data collection will continue until May 1st, 2024 for other publication purposes, data for this current study were exported from Qualtrics on February 28th, 2024, at 10:35 AM.

### *Study Flow*

When prospective participants clicked on the study link, they were directed to Qualtrics where they read the Informed Consent page. It consisted of study purposes, estimated time to complete the

survey (45 minutes), inclusion criteria, and relevant IRB information. If participants selected “I do consent to participate in this study”, they were moved forward to the ‘end of study’ page. (See Appendix C for a copy of the informed consent). If they agreed to participate, they were presented with a CAPTCHA verification, which they had to complete before they could move on. Once the CAPTCHA was completed, participants immediately began the study.

The survey consisted of the following blocks: (1) Informed Consent, (2) CAPTCHA verification, (3) BAARS-IV, (4) GAD-7, (5) BDEFS, (6) DERS, (7) Health History Form, (8) Demographics Form (which also included the Survey Experiences Form), and (9) Debrief. To avoid priming effects on various measures, the BAARS-IV, GAD-7, BDEFS, and DERS blocks were presented in randomized and counterbalanced order, followed by the Health History Form, Demographics Form, and Survey Experiences form in that order.

Across the 222 included participants, participants took a mean of 24.44 minutes (*SD* = 42.48 minutes) to complete the survey. This estimate was based on the sum of time spent on each page, except for the Debrief, which is the final page shown to participants. The estimate provided by Qualtrics (*M* = 2.68 hours, *SD* = 16.20 hours) was heavily skewed by participants who reached the Debrief page but did not immediately submit their survey responses.

***Data Quality Decisions***

Multiple strategies were employed that collectively served to mitigate the impact of careless responding on study findings (Aust et al., 2013; Curran, 2016; Meade & Craig, 2012).

First, the study initially weeded out bots with the Qualtrics CAPTCHA to prove that participants were human. Completion of the CAPTCHA was required to proceed to the rest of the survey, so suspected bots would not have been able to provide responses past the informed consent page. 9 putative participants did not complete the CAPTCHA or were flagged by Qualtrics as likely bots and provided no further responses, leaving 379 likely human participants. Second, two attention check items were embedded within other questionnaires, one in the BDEFS and another in the DERS. If participants failed to complete either of the attention checks, they were automatically excluded from data analyses. 28

participants failed one attention check, 17 failed both, and 99 discontinued the survey before reaching the attention check items. Third, a data collection opt-in/-out question was included, asking participants to identify if they would like to continue and let their data be collected because "[they] paid close attention throughout the survey," or to decline data collection because "[they] did not pay close attention and mostly clicked through the survey." Anyone who selected the latter two options on this self-rated seriousness/effort question was removed from further data analysis. 10 participants indicated that they had not taken the survey seriously, and 105 had discontinued to survey before reaching the seriousness item.

In total, 388 participants enrolled in the study, and responses from 166 were excluded due to poor data quality. For the remaining 222 cases, patterns of missing data were evaluated using Missing Values Analysis, and results showed that any data missing from the included sample was missing completely at random. Thus, the Expectation Maximization Method was not utilized for missing data. Cases with missing values were simply excluded listwise, depending on which analysis was conducted.

**Planned Analytic Strategies**

The following analyses were conducted for the purpose of testing the hypotheses of this study:

- Hypothesis 1: To test the hypothesis that ADHD symptoms, GAD symptoms, executive function deficits, and emotion regulation deficits would be positively correlated, Pearson correlation analyses were conducted among BAARS-IV total and subscale scores, GAD-7 total scores, BDEFS subscale scores, and DERS subscale scores.
- Hypothesis 2: To test the hypothesis that ADHD would be more strongly correlated with the difficulty engaging in goal-directed behavior, difficulty with impulse control, and limited access to emotion regulation strategies facets of emotion regulation compared to the emotion nonacceptance, awareness, and clarity facets, Pearson correlations between ADHD total scores and DERS subscale scores were compared using Fisher's r-to-z transformation (Lee & Preacher, 2013).

# CHAPTER 3

# RESULTS

## Hypothesis 1

The first hypothesis posited that ADHD symptoms would be positively correlated with anxiety symptoms, deficits in executive function, and difficulties in emotion regulation. Pearson correlation analyses were conducted to examine the relationships between ADHD symptoms (BAARS-IV total and subscale scores) and anxiety symptoms (GAD-7 total score), deficits in executive function (BDEFS total subscale scores), and difficulties in emotion regulation (DERS total and subscale scores). Results fully supported the first hypothesis (see Table 3).

**Table 3**

*Pearson Correlations between BAARS-IV Scores and GAD-7, BDEFS, and DERS Scores*

| Variable | *n* | *M* | *SD* | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|
| **1** BAARS-IV Total | 215 | 39.32 | 10.68 | — | | | |
| **2** BAARS-IV Inattention | 219 | 19.79 | 6.39 | .87** | — | | |
| **3** BAARS-IV Hyperactivity | 220 | 11.43 | 3.34 | .73** | .42** | — | |
| **4** BAARS-IV Impulsivity | 220 | 7.94 | 3.59 | .74** | .41** | .48** | — |
| **5** GAD-7 Total | 220 | 17.10 | 5.74 | .40** | .33* | .44** | .19** |
| **6** BDEFS Total | 199 | 192.05 | 52.56 | .74** | .81** | .40** | .40** |
| **7** BDEFS Self-Management to Time | 215 | 51.20 | 16.26 | .69** | .82** | .26** | .35** |
| **8** BDEFS Self-Organization | 211 | 53.00 | 16.23 | .63** | .69** | .38** | .31** |
| **9** BDEFS Self-Restraint | 216 | 36.19 | 10.75 | .68** | .61** | .48** | .50** |
| **10** BDEFS Self-Motivation | 218 | 22.49 | 8.77 | .58** | .69** | .19** | .33** |
| **11** BDEFS Self-Regulation of Emotion | 220 | 28.70 | 10.06 | .48** | .47** | .38** | .26** |
| **12** DERS Total | 212 | 96.47 | 29.55 | .43** | .48** | .33** | .13 |
| **13** DERS Nonacceptance of Emotions | 220 | 16.52 | 7.23 | .36** | .37** | .32** | .11 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **14** DERS Goal-Directed Behavior Difficulties | 220 | 16.57 | 5.32 | .45** | .50** | .27** | .21** |
| **15** DERS Impulse Control Difficulties | 220 | 13.25 | 5.86 | .37** | .41** | .23** | .16* |
| **16** DERS Lack of Emotional Awareness | 220 | 15.77 | 5.79 | .24** | .30** | .17** | .02 |
| **17** DERS Limited Access to Emotion Regulation Strategies | 219 | 21.59 | 8.23 | .35** | .39** | .30** | .10 |
| **18** DERS Lack of Emotional Clarity | 222 | 12.86 | 4.60 | .28** | .38** | .18** | -.004 |

*Note*. * $p < .05$, ** $p < .01$; the outline correlations were the ones compared to each other using Fisher's r-to-z transformation

**Hypothesis 2**

There were significant positive correlations between the BAARS-IV total score and all DERS subscales: nonacceptance of emotional responses, difficulty engaging in goal-directed behavior, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity. To compare the strength of the correlations between ADHD and the different DERS subscales, Fisher's r-to-z transformation was applied.

There were some pairings that were statistically significantly different. Specifically, as expected, BAARS-IV total scores were more strongly correlated with DERS *Difficulties in Engaging in Goal-Directed Behavior* than with DERS *Lack of Emotional Clarity* and *Lack of Emotional Awareness* (see Table 4). There was also an unexpected trend pointing to a somewhat stronger relationship between BAARS-IV total scores and DERS *Difficulties in Engaging in Goal-Directed Behavior* than DERS *Limited Access to Emotion Regulation Strategies*. Finally, there was an expected trend pointing to a somewhat stronger correlation between BAARS-IV total scores and DERS *Impulse Control Difficulties* DERS *Lack of Emotional Awareness*.

**Table 4**

*Select Fisher's r-to-z Transformations*

| Variables Correlated | Input | *r* | *n* | Z | *p* |
|---|---|---|---|---|---|
| BAARS-IV Total Score with<br>DERS Difficulties Engaging in Goal Directed Behavior | $r_{jk}$ | .45 | 213 | 2.65 | < .01** |
| BAARS-IV Total Score with<br>DERS Lack of Emotional Awareness | $r_{jh}$ | .24 | | | |
| DERS Difficulties Engaging in Goal Directed Behavior with<br>DERS Lack of Emotional Awareness | $r_{kh}$ | .22 | | | |
| BAARS-IV Total Score with<br>DERS Difficulties Engaging in Goal Directed Behavior | $r_{jk}$ | .45 | 213 | 1.81 | 0.07 |
| BAARS-IV Total Score with<br>DERS Limited Access to Emotion Regulation Strategies | $r_{jh}$ | .35 | | | |
| DERS Difficulties Engaging in Goal Directed Behavior with<br>DERS Limited Access to Emotion Regulation Strategies | $r_{kh}$ | .66 | | | |
| BAARS-IV Total Score with<br>DERS Difficulties Engaging in Goal Directed Behavior | $r_{jk}$ | .45 | 213 | 2.50 | 0.01** |
| BAARS-IV Total Score with<br>DERS Lack of Emotional Clarity | $r_{jh}$ | .28 | | | |
| DERS Difficulties Engaging in Goal Directed Behavior with<br>DERS Lack of Emotional Clarity | $r_{kh}$ | .42 | | | |
| BAARS-IV Total Score with<br>DERS Impulse Control Difficulties | $r_{jk}$ | .37 | 213 | 1.84 | 0.06 |
| BAARS-IV Total Score with<br>DERS Lack of Emotional Awareness | $r_{jh}$ | .24 | | | |
| DERS Impulse Control Difficulties with<br>DERS Lack of Emotional Awareness | $r_{kh}$ | .39 | | | |

*Note.* ** Transformation significant at the 0.05 level

**Supplemental Analyses**

I explored the correlations between anxiety (GAD-7 total score) and emotion regulation difficulties (DERS total and subscale scores) and executive function difficulties (BDEFS total and subscale scores; see Appendix D). GAD-7 total scores were significantly positively correlated across all total and subscale scores for both the DERS and BDEFS.

# CHAPTER 4

# DISCUSSION

## Hypothesis 1

This study aimed to investigate the relationships between ADHD symptoms (BAARS-IV), anxiety symptoms (GAD-7), deficits in executive function (BDEFS), and difficulties in emotion regulation (DERS). Hypothesis 1 predicted positive correlations among ADHD symptoms' relationships to anxiety symptoms, deficits in executive function, and difficulties in emotion regulation; the findings provided strong support for this hypothesis.

Anxiety was found to be positively associated with all aspects of ADHD symptomatology (inattention, hyperactivity, impulsivity), suggesting a broader connection beyond isolated symptoms. This finding is supported by the common literature in recent years (Dan & Raz, 2012; Houghton et al., 2013; Jarrett et al., 2016: Pliszka, 2019; Prevatt et al., 2012). Similarly, deficits in executive function were pervasive across all ADHD subtypes, encompassing self-management, problem-solving, and emotional regulation, which is also supported by the literature (Godoy et al., 2023; Roselló et al., 2020: Silverstein et al., 2018).

Though all BAARS-IV subscales correlated with overall difficulties in emotion regulation, the impulsivity subscale displayed weaker associations with specific aspects like non-acceptance of emotions and limited regulation strategies. Conversely, inattention and hyperactivity were more correlated to difficulties in emotional awareness and clarity. Though there is not much research on this specific topic, a study by Albesisi and Overton (2023) found that there were links between ADHD symptomatology and all DERS subscales, except for lack of emotional awareness not being related to ADHD hyperactivity symptoms.

These findings hold important clinical implications. The correlations of these conditions underscore the need for comprehensive assessments that consider this interconnectedness during diagnosis and treatment planning for individuals with ADHD (Pliszka, 2011). Interventions may need to extend beyond addressing core ADHD symptoms and incorporate strategies for managing anxiety and

improving emotion regulation skills (Bodalski et al., 2018; Quenneville et al., 2022). Additionally, the individualized nature of these relationships highlights the importance of tailored approaches that go beyond single-score assessments to effectively address the specific challenges faced by each individual.

**Hypothesis 2**

Though Hypothesis 1 predicted positive correlations between ADHD symptoms and all DERS subscales, a further analysis aimed to compare the strength of these correlations. For Hypothesis 2, Fisher's r-to-z transformations were applied to facilitate this comparison. The findings partially support the hypothesis that ADHD symptoms, as measured by the BAARS-IV Total Score, would be more strongly correlated with difficulties engaging in goal-directed behavior, impulse control difficulties, and limited access to emotion regulation strategies facets of emotion regulation, as measured by the DERS, than with nonacceptance of emotional responses, lack of emotional awareness, and lack of emotional clarity facets.

First, difficulties in goal-directed behavior were more strongly associated with ADHD symptoms than were lack of emotional clarity and lack of emotional awareness. There was no difference in ADHD relationship for difficulties in goal-directed behavior and emotional non-acceptance. This finding supports the notion that difficulties in goal-directed behavior are a more central aspect of emotion regulation in ADHD. This conclusion aligns with the observed pattern in the data, as individuals with ADHD are known to struggle with goal-directed behavior (Boot et al., 2017; Wilens & Spencer, 2010). The finding that difficulties in goal-directed behavior are more strongly associated with ADHD than other aspects of emotional regulation suggest important implications for mental health care clinicians. First, a focus on addressing underlying executive functioning deficits. Difficulties in goal-directed behavior often stem from underlying executive function deficits, such as poor working memory, planning, and time management (Gross & Grossman, 2010; Rabinovici et al., 2015). Second, Clinicians may need to incorporate interventions specifically targeting these areas to improve overall emotion regulation. Though not as strongly linked to ADHD as goal-directed behavior, emotional non-acceptance still plays a role. Clinicians should explore possible techniques like mindfulness and acceptance-based therapies to help

individuals with ADHD develop healthier coping mechanisms for managing difficult emotions (Munawar et al., 2021; Seery et al., 2023). Overall, by incorporating these considerations, mental health professionals can provide more comprehensive and effective care for individuals with ADHD, ultimately improving their well-being and functioning in various aspects of life.

Next, impulse control difficulties were correlated with ADHD symptoms, but its relationship to ADHD symptoms was comparable to the relationships of lack of emotional clarity and emotional non-acceptance to ADHD. There was, however, a trend toward impulse control difficulties being more strongly correlated with ADHD symptoms than was lack of emotional awareness. The interplay between impulse control and emotional regulation highlights the need for a nuanced approach in treating individuals with ADHD. Though the study suggests difficulties in goal-directed behavior are a more central aspect of emotional regulation in ADHD, impulse control is still an important part of the picture. Clinicians can leverage this knowledge by exploring combined interventions. Depending on individual needs, they can combine strategies for improving goal-directed behavior with techniques like CBT to manage impulsivity (Lopez et al., 2018; Pan et al., 2020). Additionally, addressing emotional regulation issues might indirectly support better impulse control and, consequently, improved goal achievement (Jakubczyk et al., 2018; Lazuras et al., 2018; Wypych et al., 2018; Young et al., 2019). Taking a holistic approach, addressing both core and associated challenges, can empower clinicians to provide more comprehensive and effective care for individuals with ADHD.

Finally, the study revealed two key findings: firstly, the connection between limited access to emotion regulation strategies and ADHD was comparable to the associations between ADHD and other aspects of emotional regulation, like emotional clarity, awareness, and non-acceptance. Secondly, there was a surprising trend suggesting that limited access to emotion regulation strategies might even be less strongly linked to ADHD than difficulties in goal-directed behavior. These findings hold important implications for mental health professionals. The observed variability emphasizes the need for individualized treatment approaches. Though difficulties in goal-directed behavior emerge as the most significant factor associated with ADHD, the findings emphasize the variability across individuals.

Though addressing difficulties in goal-directed behavior remains a crucial focus, clinicians should be aware that other aspects of emotional regulation, including access to coping strategies, may vary in their relevance across different individuals with ADHD. Clinicians should avoid a one-size-fits-all approach and prioritize individualized assessments to identify the specific challenges each client faces in terms of emotional regulation. This understanding allows for the development of interventions that are tailored to each client's specific needs and challenges, ultimately leading to more effective and personalized care. Additionally, clinicians may want to consider targeted interventions for clients, including goal-setting skills training and mindfulness-based interventions (Bachmann et al., 2016; Nordby et al., 2021; Poissant et al., 2019).

In conclusion, these findings highlight the critical role of individualized treatment planning for individuals with ADHD. By recognizing the heterogeneity in the presentation of emotional regulation challenges, clinicians can prioritize comprehensive assessments to identify the specific needs and challenges of each client. This understanding can then inform the development of tailored interventions, such as those focusing on goal-directed behavior and potentially incorporating strategies to address other aspects of emotional regulation when relevant. Ultimately, this patient-centered approach has the potential to optimize treatment outcomes and lead to improved emotional well-being and overall functioning for individuals with ADHD.

Though other comparisons were non-significant, there were trends towards significant positive differences between the correlations. This implies that DERS subscales might be more strongly associated with ADHD symptoms compared to others, which is supported by recent literature in this area by Albesisi and Overton (2023). However, several factors limit the conclusions that can be drawn from this analysis: sample size and data variability (W. H. Thompson & Fransson, 2016). The study's sample size ($N$ = 222) might be insufficient to detect statistically significant differences, even if they exist. Larger sample sizes could provide greater statistical power to detect these potential disparities. Furthermore, the presence of outliers or skewed distributions in the data may complicate the interpretation of correlation coefficients.

Even with a larger sample size, these factors could make it challenging to identify true differences in the strength of correlations (W. H. Thompson & Fransson, 2016).

Therefore, though the current analysis only finds partial support for the second hypothesis, it does not refute it. The observed trends suggest the potential for differential relationships between specific DERS subscales and ADHD symptoms (Albesisi & Overton, 2023; Bunford et al., 2015; Soler-Gutiérrez et al., 2023). However, further research with larger and more representative samples, along with robust data analysis techniques that account for potential data variability, is needed to definitively address this question.

Future research on these relationships would benefit from employing larger and more diverse samples to increase statistical power and generalizability, in addition to utilizing longitudinal designs to explore the causal relationships between ADHD symptoms and various aspects of emotion dysregulation. Furthermore, future directions should consider incorporating multimodal assessments beyond self-reports, such as objective measures of cognitive function and emotion regulation, to provide a more comprehensive understanding of the underlying mechanisms. By addressing these limitations and incorporating these suggested advancements, future research can shed further light on the complex interplay between ADHD and emotion dysregulation, ultimately contributing to the development of more effective interventions for individuals experiencing these challenges.

**Supplemental Analyses**

The supplemental analyses explored the correlation between anxiety, difficulties with emotion regulation, and difficulties with executive function. Anxiety was significantly positively correlated with difficulties in emotion regulation and difficulties with executive function, as well as with all of the facets of both. These findings support other research showing that relative deficits of executive functions are associated with greater levels overall of emotion dysregulation and anxiety symptoms (Ajilchi & Nejati, 2017; Koay & Meter, 2023). While anxiety can be inhibitory for certain cognitive functions, it can also exert undue strain on executive functions if

anxiety levels are clinically significant, potentially leading to reduced working memory and further impairments in executive functions. Conversely, a person with higher executive functioning may be able to better manage across all anxiety levels, thus having a better relationship with anxiety and emotion regulation.

**Implications**

The current research provides evidence for positive correlations between ADHD symptoms, GAD symptoms, executive function deficits, and emotion regulation deficits. This finding aligns with our first hypothesis, suggesting that these factors are interconnected and may contribute to each other. The findings emphasize that these are not separate concepts, and more connected than the current literature sets them out to be. The implications of these findings could impact how therapeutic interventions may be tailored to ADHD individuals. To elaborate further, the proposed results would underscore how vital a holistic and multidisciplinary approach to ADHD management would be to better client care in mental health settings. It could mean for ADHD management a focus towards addressing common experiences ADHD clients have, like emotion dysregulation, to better ADHD client outcomes by adapting therapies commonly used for the conditions, such as Cognitive Behavioral Therapy, to become more holistic and inclusive. In a broader context, these findings could advance both theoretical understanding and practical strategies for improving outcomes for individuals with ADHD, thus this research provides insights for patients, educators, clinicians, and researchers in the field. However, it is important to note that Hypothesis 2 regarding differential correlations within the emotion regulation domain was not statistically supported. Therefore, though this research contributes to a more nuanced understanding of the interconnectedness of ADHD symptoms, anxiety, and associated difficulties, further investigation is needed to refine our understanding of specific facets of emotion regulation and their unique relationships with ADHD.

## Limitations and Future Directions

Limitations of this study include a variety of study-specific concerns, but also broader, more overarching limitations.

### *Sampling and Recruitment*

A limitation of this study may include sampling bias, which is present because the sample is expected to be unrepresentative of the population, with a bias toward White/ European Americans that identify as cisgender females. This is due to convenience sampling from a university in the southeastern United States. Additionally, the physical and virtual fliers consisting of basic study information (i.e., topics of mental health, worry, coping) could have led to self-selection bias towards white, heterosexual, cisgender women as that population is more likely to be willing to speak about mental health experiences. In addition to this, recruitment bias may be present due to the restrictions on how recruitment could be achieved for this study through university means, though some accommodations were made to recruit from other methods (see Recruitment).

### *Data Collection and Analysis*

Limitations may also include Attention Checks and Data Quality procedures, and though the current study implements several strategies to identify and mitigate careless responding, it's still possible that participants might not engage with the survey seriously, affecting the quality of collected data. To elaborate further on this limitation, the study will also exclude participants who fail attention checks as well as those who opt out of data collection at the end of the study, which also may lead to a bias in the final sample.

**Population Considerations.** One limitation of this study concerns the nature of our participant population. Individuals with ADHD often experience difficulties with sustained attention and focus. Though attention checks were employed to ensure engagement, it's possible that some participants with ADHD, particularly those with higher symptom severity, may have inadvertently missed some due to these challenges. To make the situation more profound, Qualtrics did not allow for answers in matrix questions to be removed once selected, thus possibly excluding more impulsive participants via attention

checks. This raises the question of whether allowing for one missed attention check might have improved data quality and captured a more accurate representation of their experience. Further research is needed to investigate the optimal approach to attention checks in research involving individuals with ADHD.

Additionally, differences in cognitive processing speed and resource allocation between individuals with and without ADHD could have influenced their engagement with the study materials (Wiig & Nielsen, 2012). Though the tasks were designed to be accessible to a diverse range of participants, it's possible that some with ADHD encountered greater difficulty due to these neurological differences. Future studies could benefit from incorporating measures of cognitive processing alongside the primary outcome variables to better understand and account for these potential discrepancies.

**Fisher's r-to-z Transformation.** Though employing Fisher's r-to-z transformations provides a method for comparing correlations, this approach has limitations in the context of the present study. Firstly, the interpretation of statistical significance becomes heavily reliant on sample size. A larger sample may have yielded statistically significant differences between correlations, even if the actual differences in effect size are small. Secondly, Fisher's r-to-z transformation primarily addresses whether differences in correlations are statistically significant, but it doesn't directly quantify the practical significance of these differences. It's essential to consider the absolute differences between the original correlations and interpret the findings within the specific research question about ADHD and emotion regulation to gauge potential real-world implications. Finally, Fisher's r-to-z transformations assume normality in the distribution of correlation coefficients, the violation of which could impact the accuracy of the calculated z-scores and p-values.

### *Methodological Considerations*

Methodological limitations of this study include the heavy reliance on self-report measures that this study requires, which are subject to good participant biases, response styles, and social desirability effects. The accuracy of self-report while handling sensitive topics like mental health symptoms might compromise the external and internal validity of the study. In addition to this, the study is a cross-

sectional, correlational design, which not only inherently limits the ability to infer causality, but also limits the ability to observe any changes or developments over time to make more accurate inferences.

### *External Factors and Biases*

As for external limiting factors and biases, we could not control for external life factors in individual participants such as medication changes, stressful life events, anecdotal experiences, and other unknown or unaddressed influences.

## Conclusion

In conclusion, this research focuses on filling a gap in the literature that needs to address the relationship between ADHD, and common issues with comorbid anxiety and emotion regulation. First, these findings pave the way for research towards generating targeted interventions in clinical mental health settings, guiding more holistic therapies that address ADHD related emotion regulation challenges. Second, the findings of this study may open new routes in cognitive psychology research by investigating more in-depth about the executive functions that might also play a role in the cognitive processes that are involved in ADHD and anxiety. Lastly, the findings of this study may be investigated by physiological psychologists who might look more in-depth about the functions of the vmPFC in ADHD populations that have comorbid anxiety on a variety of emotion regulation tasks. Overall, this study's potential implications transcend the fields of psychology, offering insights for clinicians, researchers, educators, and patients, promising to inform interventions, scientific inquiries, and physiological explorations.

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# APPENDIX A

# RECRUITMENT MATERIALS

## Sona Description

| | |
|---|---|
| Study Name | Investigating your Experiences with Mental Health |
| Study Type | **Online Study**<br>This study is an online study on another website. To participate, sign up, and then you will be given access to the website to participate in the study. |
| Credits | 1 Credits |
| Duration | 45 minutes |
| Abstract | In this online survey, you will be asked questions about your experiences with mental health (such as worry, concentration, and coping), as well as questions about demographics. |
| Eligibility Requirements | 18 years of age and older |

## Physical Flier

**Virtual Flyer**


**Sample Social Media Post**

Social media posts may or may not have included the virtual flier, depending on constraints of the social media platform. The exact wording of posts also varied, depending on platform constraints, such as needing to shorten post based on common post formats and character/word limits on different social media platforms. Below is a typical post:

> Hey everyone! I'm working on my thesis about mental health experiences, and I need your help!
>
> This anonymous survey takes about 30-45 minutes to complete and asks questions about things like worry, focus, and coping.
>
> Your participation is completely voluntary, and you can stop anytime.
>
> If you're 18+, click the link below to participate!
>
> tinyurl.com/MScStudy2024

Hashtags were also included and varied based on forum focus and platform character/word limits. Below is a list of hashtags included across different posts:

| | | |
|---|---|---|
| #BeHeard | #HelpScience | #SpreadTheWord |
| #BreakTheStigma | #JoinTheMovement | #Students |
| #College | #LetsTalkMH | #Survey |
| #Community | #MakeADifference | #TakeAction |
| #Concentration | #Masters | #Thesis |
| #ContributeToScience | #MentalHealth | #Undergrad |
| #Coping | #MentalHealthAwareness | #UnitedStates |
| #Dissertation | #MentalHealthMatters | #University |
| #Emotions | #NoShameInMentalHealth | #Worry |
| #GeorgiaSouthern | #Research | #YourStoryMatters |

**IRB Approved Recruitment Avenues**

Places of University Recruitment:

Academic Success Center

College of Graduate Studies

Psychology Department

Students with Disabilities Advocacy Group (SDAG)

Office of International Student Admissions and Programs

National Youth Advocacy and Resilience Research Center

Criminal Justice and Criminology Department

Honors College

GSU Psychology Clinic

Statesboro Campus Clinic

Honors Student Org

RCLD

Student Government Association (SGA)

Places of Reddit Recruitment (Approved Subreddits):

r/APPsychology

r/TwoXADHD

r/adhd_college

r/CounselingPsychology

r/OCD

r/AdultADHDSupportGroup

r/Disability_Survey

r/mentalhealth

r/ADHD

r/lgbtstudies

r/ADHDthriving

# APPENDIX B

## STUDY QUESTIONNAIRES

***Barkley Adult ADHD Rating Scale-IV*** (BAARS-IV; Barkley, 2011a)

This questionnaire is copyrighted. Please contact the publishing company for this measure, should you want to acquire a copy.

***Generalized Anxiety Disorder-7*** (GAD-7; Spritzer, 2006)

Over the *last 2 weeks*, how often have you been bothered by the following problems?

1. Feeling nervous, anxious or on edge
2. Not being able to stop or control worrying
3. Worrying too much about different things
4. Trouble relaxing
5. Being so restless that it is hard to sit still
6. Becoming easily annoyed or irritated
7. Feeling afraid as if something awful might happen

   [*Response options for items 1-7*]

   - ○ [*1*] Not at all
   - ○ [*2*] Several days
   - ○ [*3*] More than half the days
   - ○ [*4*] Nearly every day

8. [*Branching logic. This question appeared if they responded with 2 or higher on one or more of items 1-7*]. Have you experienced these problems for at least six months?

   - ○ No
   - ○ Yes

9. [*Branching logic. This question appeared if they responded with 2 or higher on one or more of items 1-7*]. How difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

   - ○ [*1*] Not difficult at all
   - ○ [*2*] Somewhat difficult
   - ○ [*3*] Very difficult
   - ○ [*4*] Extremely difficult

***Barkley Deficits in Executive Functioning Scale*** (BDEFS; Barkley, 2011b)

This questionnaire is copyrighted. Please contact the publishing company for this measure, should you want to acquire a copy.

**[NOTE: An attention check item ("Paying attention is important. Skip this question and go on to the next.") was embedded between items 51 and 52.]**

***Difficulties in Emotion Regulation Scale*** (DERS; Gratz & Roemer, 2003)

Please select the response for each item that is most true for you.

[*Nonacceptance of emotional responses*]

11. When I'm upset, I become angry with myself for feeling that way.
12. When I'm upset, I become embarrassed for feeling that way.
21. When I'm upset, I feel ashamed with myself for feeling that way.
23. When I'm upset, I feel like I am weak.
25. When I'm upset, I feel guilty for feeling that way.
29. When I'm upset, I become irritated with myself for feeling that way.

[*Difficulty engaging in goal-directed behavior*]

13. When I'm upset, I have difficulty getting work done.
18. When I'm upset, I have difficulty focusing on other things.
20. When I'm upset, I can still get things done. [*Reversed*]
26. When I'm upset, I have difficulty concentrating.
33. When I'm upset, I have difficulty thinking about anything else.

[*Impulse control difficulties*]

3. I experience my emotions as overwhelming and out of control.
14. When I'm upset, I become out of control.
19. When I'm upset, I feel out of control.
24. When I'm upset, I feel like I can remain in control of my behaviors. [*Reversed*]
27. When I'm upset, I have difficulty controlling my behaviors.
32. When I'm upset, I lose control over my behaviors.

[*Lack of emotional awareness*]

2. I pay attention to how I feel. [*Reversed*]
6. I am attentive to my feelings. [*Reversed*]
8. I care about what I am feeling. [*Reversed*]

10. When I’m upset, I acknowledge my emotions. [*Reversed*]
17. When I'm upset, I believe that my feelings are valid and important. [*Reversed*]
34. When I'm upset, I take time to figure out what I'm really feeling. [*Reversed*]

[*Limited access to emotion regulation strategies*]

15. When I'm upset, I believe that I will remain that way for a long time.
16. When I'm upset, I believe that I'll end up feeling very depressed.
22. When I'm upset, I know that I can find a way to eventually feel better. [*Reversed*]
28. When I'm upset, I believe there is nothing I can do to make myself feel better.
30. When I'm upset, I start to feel very bad about myself.
31. When I'm upset, I believe that wallowing in it is all I can do.
35. When I'm upset, it takes me a long time to feel better.
36. When I'm upset, my emotions feel overwhelming.

[*Lack of emotional clarity*]

1. I am clear about my feelings. [*Reversed*]
4. I have no idea how I am feeling.
5. I have difficulty making sense out of my feelings.
7. I know exactly how I am feeling. [*Reversed*]
9. I am confused about how I feel.

[*Response options for all items*]

- [*1*] Almost never (0-10%)
- [*2*] Sometimes (11-35%)
- [*3*] About half the time (36-65%)
- [*4*] Most of the time (66-90%)
- [*5*] Almost always (91-100%)

**[NOTE: An attention check item (Your attention is appreciated. Leave this item blank.) was embedded between items 22 and 23.]**

**Health History Form**

Has a doctor or other health professional ever diagnosed you with the following conditions?

1. Anxiety disorder (e.g., social phobia, generalized anxiety disorder, panic disorder, obsessive-compulsive disorder)
2. Attention Deficit Hyperactivity Disorder (ADHD)
3. Learning disorder related to executive function
4. Other learning disorder
5. Mood disorder (e.g., major depressive disorder, bipolar depression, mania)

Do you take medications for the following conditions?

6. Anxiety disorder (e.g., social phobia, generalized anxiety disorder, panic disorder, obsessive-compulsive disorder)
7. Attention Deficit Hyperactivity Disorder (ADHD)
8. Learning disorder related to executive function
9. Other learning disorder
10. Mood disorder (e.g., major depressive disorder, bipolar depression, mania)

[*Response options for* items *1-10*]

- ○ No
- ○ Yes

11. On average, how many caffeinated beverages do you consume per day? Caffeinated beverages include coffee, tea, soda, energy drinks, etc.

- ○ None
- ○ One
- ○ Two

- ○ Three
- ○ Four
- ○ Five
- ○ More than five

**Demographics Form**

1. How old are you? _____
2. How would you describe yourself? [*Listed alphabetically*]
    - ○ Cisgender man
    - ○ Cisgender woman
    - ○ Non-binary, genderqueer, or gender fluid individual
    - ○ Transgender man
    - ○ Transgender woman
    - ○ A better description not listed above: _____
    - ○ Prefer not to say
3. How would you describe yourself? Check all that apply. [*Listed alphabetically*]
    - ☐ American Indian or Alaska Native
    - ☐ Asian
    - ☐ Biracial or multiracial
    - ☐ Black or African American
    - ☐ Hispanic or Latino
    - ☐ Middle Eastern or North African
    - ☐ Native Hawaiian or Pacific Islander
    - ☐ White
    - ☐ A better description not listed above: _____
    - ☐ Prefer not to say
4. How would you describe yourself? [*Listed alphabetically*]
    - ○ Asexual
    - ○ Bisexual
    - ○ Gay
    - ○ Heterosexual/straight

- ○ Lesbian
- ○ Pansexual
- ○ A better description not listed above: _____
- ○ Prefer not to say

5. How would you describe the town or city where you grew up? (If you moved and grew up in very different areas, think of the kinds of areas you lived in the longest.)
   - ○ Rural – country area
   - ○ Small Town – not near a big city
   - ○ Suburban – near a big city
   - ○ Urban – big city
6. What is your mother's highest level of education?
   - ○ Did not attend high school
   - ○ Attended high school
   - ○ Completed high school (or earned certificate of high school equivalency, GED)
   - ○ Attended college
   - ○ Completed two-year college degree
   - ○ Completed four-year college degree
   - ○ Attended graduate or professional school
   - ○ Completed graduate or professional degree
   - ○ Not sure
   - ○ Not applicable
7. What is your father's highest level of education?
   - ○ Did not attend high school
   - ○ Attended high school
   - ○ Completed high school (or earned certificate of high school equivalency, GED)
   - ○ Attended college

- ○ Completed two-year college degree
- ○ Completed four-year college degree
- ○ Attended graduate or professional school
- ○ Completed graduate or professional degree
- ○ Not sure
- ○ Not applicable

**Survey Experiences Form**

You are almost finished! Thank you for participating in this study. We have a few more questions about your experience with the survey.

1. Where did you learn about this survey?
    - ○ Sona
    - ○ Poster/flier on campus
    - ○ Email (includes newsletters and fliers emailed to you)
    - ○ Class
    - ○ Social Media
    - ○ Other: _____
2. [*Branching logic. This question appears if they responded "Social Media" as to where they learned about the survey.*] What social media platform did you learn about this survey from?
    - ○ Discord
    - ○ Facebook
    - ○ Instagram
    - ○ LinkedIn
    - ○ Reddit
    - ○ Snapchat
    - ○ Threads
    - ○ Other: _____
3. What do you think the purpose of this study was? _____
4. We want to know whether participants paid attention during the survey so that we know whether we should include their data in our analyses. No matter your answer, we appreciate you taking the time to be involved in our study, and you will still receive full Sona credit.

Which of the following most describes you?

- ○ I paid close attention throughout the survey. Keep my data.
- ○ I did not pay close attention and mostly clicked through the survey. Throw out my data.

# APPENDIX C

## INFORMED CONSENT AND DEBRIEF

**Informed Consent**

You are invited to participate in a survey study conducted by A. Shea Hall, a Master of Science Student at Georgia Southern University and Dr. Dorthie Cross, a faculty member in the Department of Psychology at Georgia Southern University. You are being asked to participate in this study because you have had this survey link distributed to you. The purpose of the study is to explore people's experiences with mental health and emotions. You will be asked questions about things like worry, concentration, organization, and coping.

The survey should take about 30-45 minutes to complete. If you are completing this survey for class credit, completing the survey is worth ONE (1) research credit on Sona.

If you wish to seek mental health assistance related to your participation in this study, you may contact the Georgia Southern University Counseling Center during normal business hours (M-F 8am to 5pm) to find out about resources available to you:

**Counseling Center:**

Statesboro Campus: 912-478-5541

Armstrong Campus: 912-344-2529

More information: https://students.georgiasouthern.edu/counseling/crisis/

These and additional resources will be provided again at the end of the study.

The information you provide may not benefit you directly but will help researchers better understand peoples' experiences with mental health. There are no costs to you for participating in the study.

Participation in this study is completely voluntary. Even if you choose to participate, you are free to discontinue the survey at any time. You are also free not to answer any particular question within the survey. There is no penalty for choosing not to participate or for discontinuing participation.

If you are considering participating in this study for course research credit, remember that participating in this study is not the only option you have to earn course research credits. You may choose to participate in other studies instead, or you may choose to complete equivalent alternative assignments as laid out by your instructor. If you choose not to participate or decide to discontinue, you will not lose research credit. To earn research credit for this study, you must agree to participate in this study and must click through to the last page of the survey to submit your responses (even if incomplete). Sona will automatically apply research credit when you submit the survey.

No personally identifying information will be collected for this study; however, absolute anonymity can never be guaranteed over the Internet. Data from this study will be maintained indefinitely by Dr. Dorthie Cross. Study data may be used in research publications or presentations. Data from this study may be placed in a publicly available repository for study validation and further research. You will not be identified in any publication, presentation, or public dataset using information obtained from this study. Subsequent uses of records and data will be subject to standard data use policies which protect the anonymity of individuals and institutions. Individuals from the Georgia Southern University Institutional Review Board may inspect all study records to ensure research procedures are properly followed.

This study has been reviewed and approved by the Georgia Southern University Institutional Review Board under tracking number H24097. For questions concerning your rights as a research participant in this or other studies, contact Georgia Southern University Institutional Review Board at 912-478-5465. For questions about this study, contact Dr. Dorthie Cross.

**Study Title:**

Investigating your Experiences with Mental Health

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**You must be at least 18 years old to consent to participate in this study.**

- ○ I agree to participate in this study.
- ○ I do NOT agree to participate in this study.

**Debrief**

Thank you for participating in this study and helping researchers better understand how things like anxiety and attention are related. **Your SONA credit will be automatically applied once you submit your survey by clicking the arrow in the bottom right corner of your screen.**

We recognize that thinking about and answering questions about mental health can be upsetting. If these questions made you think about areas of your life that you would like to talk more about, we encourage you to call or visit the Georgia Southern University Counseling Center during normal business hours (M-F 8am to 5pm) to find out about resources available to you.

Counseling Center:

Statesboro Campus: 912-478-5541

Armstrong Campus: 912-344-2529

More information: https://students.georgiasouthern.edu/counseling/crisis/

For immediate help after hours or if you are unable to get to the Counseling Center, call the Georgia Southern University Campus Police. They can connect you with an on-call counselor. You may also call the local police department at 911 at any time if you believe you or someone else is at risk.

Emergencies and After-Hours Care:

Statesboro Campus Police: 912-478-5234

Armstrong Campus Police: 912-344-3333

Other Resources:

National Suicide Prevention Lifeline

24/7 Crisis Line: 1-800-273-8255

https://suicidepreventionlifeline.org/

APPENDIX D

EXTENDED PEARSON CORRELATIONS TABLE

| Variable | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **5** GAD-7 Total | — | | | | | | | | | | | | |
| **6** BDEFS Total | .49** | — | | | | | | | | | | | |
| **7** BDEFS Management | .29** | .88** | — | | | | | | | | | | |
| **8** BDEFS Organization | .41** | .88** | .70** | — | | | | | | | | | |
| **9** BDEFS Restraint | .42** | .83** | .58** | .64** | — | | | | | | | | |
| **10** BDEFS Motivation | .29** | .86** | .79** | .69** | .61** | — | | | | | | | |
| **11** BDEFS Regulation | .57** | .72** | .46** | .51** | .69** | .48** | — | | | | | | |
| **12** DERS Total | .61** | .92** | .87** | .77** | .77** | .81** | .75** | — | | | | | |
| **13** DERS Nonacceptance | .54** | .70** | .48** | .57** | .59** | .48** | .57** | .83** | — | | | | |
| **14** DERS Goal-Directed | .41** | .49** | .34** | .37** | .46** | .31** | .61** | .71** | .50** | — | | | |
| **15** DERS Impulse | .54** | .67** | .50** | .57** | .49** | .53** | .74** | .85** | .68** | .60** | — | | |
| **16** DERS Awareness | .29** | .60** | .37** | .45** | .56** | .42** | .33** | .64** | .39** | .22** | .39** | — | |
| **17** DERS Strategies | .58** | .39** | .32** | .36** | .31** | .24** | .75** | .91** | .74** | .66** | .77** | .42** | — |
| **18** DERS Clarity | .37** | .62** | .40** | .49** | .53** | .45** | .49** | .76** | .50** | .42** | .57** | .67** | .58** |

NOTE: * $p < .05$, ** $p < .01$; the outline correlations were the ones compared to each other using Fisher's r-to-z transformation; BDEFS Management = BDEFS Self-Management to Time, BDEFS Organization = BDEFS Self-Organization and Problem Solving, BDEFS Restraint = BDEFS Self-Restraint, BDEFS Motivation = BDEFS Self-Motivation, BDEFS Regulation = BDEFS Self-Regulation of Emotion; DERS Nonacceptance = DERS Nonacceptance of Emotions, DERS Goal-Directed = DERS Goal-Directed Behavior Difficulties, DERS Impulse = DERS Impulse Control Difficulties, DER Awareness = DERS Lack of Emotional Awareness, DERS Strategies = DERS Limited Access to Emotion Regulation Strategies, DERS Clarity = DERS Lack of Emotional Clarity