COLLEGE STUDENTS' PERCEPTIONS OF MALINGERING ATTENTION DEFICIT HYPERACTIVITY DISORDER

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ABSTRACT

This study assessed college students' knowledge and perceptions of attention deficit hyperactivity disorder (ADHD) to help identify patterns of behavior in those who malinger ADHD in a college environment. Specifically, I sought to determine what behaviors college students attribute to ADHD and how those behaviors are demonstrated when malingering the disorder. Participants in this study were neurotypical college students and those with a valid ADHD diagnosis. Half of the neurotypical participants were instructed to malinger ADHD on all study assessments. Participants who were instructed to malinger ADHD subjectively reported significantly more symptoms than their neurotypical peers, but not their valid ADHD counterparts. They also responded with a significantly different error pattern on experimental assessments. The findings from this study can inform future research regarding specific assessments that will capture discrepancies between individuals who malinger ADHD and legitimate cases.

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CHAPTER I

INTRODUCTION

Background

Attention deficit hyperactivity disorder (ADHD) is one of the most commonly diagnosed mental disorders in children and adults (Merikangas et al., 2010). The number of individuals who are diagnosed with ADHD has been steadily growing each year, with studies suggesting that around 11% of children and 4% of adults have been diagnosed with ADHD by a licensed professional (Novotney, 2014). ADHD is a psychiatric disorder present from birth (El-Faddagh et al., 2004) and while it does not have a cure, there are known treatments for the symptoms. Professionals working in disability resource offices spend their time, energy, and money to provide accommodations, adaptive technology, and support to people with disabilities such as ADHD. These resources are limited, though, so it is increasingly important that clinicians are able to reliably and consistently diagnose true ADHD individuals, allowing those supports and funding to be allocated to individuals who genuinely require them instead of people who do not truly qualify for them.

Most recent versions of the Diagnostic and Statistical Manual (DSM) have subdivided ADHD into three subtypes: inattentive type, hyperactive/impulsive type, and combined type (American Psychiatric Association, 2000; American Psychiatric Association, 2013). There are nine specific inattentive symptoms and nine specific hyperactive/impulsive symptoms. The inattentive symptoms include behaviors such as failing to pay close attention to details, making

careless mistakes, often losing things needed for activities or tasks, and regularly being easily distracted by extraneous stimuli. The hyperactive/impulsive symptoms, on the other hand, include things like fidgeting or squirming regularly, struggling to wait their turn, talking excessively, an inability to participate in calm activities quietly, and regularly interrupting or intruding on other's conversations or games.

As ADHD stands today, there are several symptoms that must be experienced, and criteria that must be met, to warrant a diagnosis (American Psychiatric Association, 2013). A licensed psychologist or psychiatrist is generally responsible for conducting assessments to diagnose ADHD, though a family doctor, nurse practitioner, neurologist, a master's level counselor, or social worker may also diagnose ADHD (Editors, 2017). Any ADHD symptom must be present and observable for at least six months prior to the assessment to qualify as a valid symptom (American Psychiatric Association, 2013). Individuals aged 16 or under must meet six out of the possible nine symptoms to be diagnosed with a specific subtype, while anyone aged 17 and older must only meet five of the symptoms to receive a diagnosis of that subtype. If individuals meet five to six of the symptoms for only one subtype, they will receive a diagnosis of ADHD with that subtype only. Those meeting the five to six criteria for both the inattentive and the hyperactive/impulsive subtype will then be moved to the combined subtype for their diagnosis.

Once the symptoms have been observed and documented, assessors must confirm that the symptoms being reported were present prior to the age of 12. Although the average age of diagnosis is 7 years old (Visser et al., 2014), ADHD is thought to be present from birth (El-Faddagh et. al., 2004). Therefore, symptoms that appear at random after the age of 12 are not currently considered to be valid symptoms to warrant ADHD diagnosis. To ascertain if valid

symptoms were present in childhood, assessors will generally seek self-report information from the individual but will also seek informant-reports from parents or guardians, and any relevant teachers or caregivers who are in regular contact with the person being assessed.

For individuals meeting the symptom requirements for a diagnosis, who are also able to confirm the existence of symptoms before the age of 12, the assessor must then be able to confirm that the symptoms are consistent across multiple situations (American Psychiatric Association, 2013). If a person only displays fidgeting in a specific setting (i.e. the individual only fidgets during class time at school but can sit still without fidgeting at home or the movies), then this will not be classified as a symptom that warrants diagnosis. Symptoms do not have to be present in every single aspect of the person's life, but they must be observable and consistent in multiple scenarios.

The final criterion that must be met for a diagnosis of ADHD, which was introduced in the DSM-IV, is that the symptoms must cause clinically significant impairment (American Psychiatric Association, 2013). This impairment may affect the individual's occupational, academic, or even social function. This means that an individual can be prone to fidgeting or interrupting others, but if it does not have a significant negative impact of the successful functioning of the person, it will not warrant diagnosis. Some examples of occupational impairment include an inability to remain at their workstation throughout the day, or frequently losing necessary documents or material they need to complete tasks. Academically, people with ADHD will find it difficult to concentrate in classroom settings due to the many distractions, and they will tend to be disorganized with their schoolwork and struggle to remember to turn in completed assignments (Gureasko-Moore, Dupaul, & White, 2006). Since its introduction to the DSM, ADHD has continued to steadily rise in prevalence. Since 1998, the prevalence of ADHD

diagnoses has increased from 3-5% to around 12% (Walkup et al., 2014). Pastor and colleagues (2015) have demonstrated that generally, boys are more likely to be diagnosed with ADHD than girls, and non-Hispanic white individuals are more likely than Hispanic or non-Hispanic black individuals to be diagnosed. The prevalence of ADHD diagnoses also varies across age ranges. Between the ages of ages of 5 and 11 the prevalence is 8.6% while the prevalence is 14.3% among teens aged 13 to 17 (Reuban & Elgaddal, 2024).

Beyond age 17, the prevalence of ADHD drops to somewhere between 3.1% and 4.5% in the general population (Ayano et al., 2022; Kessler et al., 2006) but among similarly aged individuals who are attending college, the prevalence is almost double, with an estimated 16% of the college population reporting a diagnosis of ADHD (Mak et al., 2022). This discrepancy, between the general adult population's prevalence of ADHD and that of college students, is particularly striking as there are not similar prevalence discrepancies for other neurodevelopmental disorders, such as autism spectrum disorders, dyslexia, and other learning disorders. The ADHD discrepancy is likely due to many reasons. For one, attention to ADHD as a diagnosis has increased over the last 15 years, so adults today may not be as aware of how their behaviors align with ADHD. In addition, the school context likely leads to more attention to children's behavior than would be common in adult's work and home contexts. I suggest however that another explanation may be that prevalence of ADHD in college students may be elevated due to some students dishonestly reporting symptoms of ADHD (Harrison, 2006).

ADHD in the College Environment

Trying to convince a diagnostician that one is experiencing ADHD when that is not actually true could be labeled as faking, sub-optimal effort, and/or malingering. Each of these terms have commonalities in their definition, but there are also key differences that are important

to identify. While all three terms refer to situations where an individual demonstrates behaviors that are not reflective of their true capabilities, the differences between the terms lies in the details. Faking refers to the falsification of symptoms to simulate an illness or mental disorder (Nott, 2013). Sub-optimal effort refers to situations where a participant intentionally underperforms on an examination or psychological test (Gudjonsson & Young, 2009). Malingering is a bit different, as it refers more specifically to the individual's reason for deceiving an assessor. Malingering is defined as the intentional production of false or grossly exaggerated physical or psychological problems (American Psychological Association, 2013). Individuals who malinger fake a disorder and/or put forth sub-optimal effort to obtain some benefit for themselves (Gudjonsson & Young, 2009). This benefit could be anything from food and shelter to prescription medication or avoidance of responsibility (i.e. criminal charges or military duty) (Gorman, 1982). Detection of malingering is challenging at best but may be especially difficult for disorders like ADHD where studies have largely been unsuccessful in differentiating between people who truly experience ADHD and individuals who are malingering or exaggerating symptoms (Novotney, 2014).

There are many reasons why an individual may wish to malinger a disability such as ADHD. ADHD is covered under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act, meaning that people with a diagnosis of ADHD are entitled to several legal, medical, and financial benefits (Wolf, 2001). These benefits often carry over into the college environment. For example, at the University of Tennessee at Chattanooga, typical accommodations for ADHD include the following: extended time on tests, extended assignment deadlines, and regular academic coaching with an employee of the university's Disability Resource Center. Another potential reason that one might malinger ADHD symptoms is to

obtain access to prescription medications that can be sold to other college students who might take that medication illegally to boost their test scores and performance in school (DeSantis et al., 2008; Rabiner et al., 2008; Rabiner et al., 2009). Fabricating or exaggerating symptoms to receive the benefits and accommodations associated with an ADHD diagnosis is referred to as ADHD malingering.

Detecting malingering of symptoms of any disorder or condition assumes that malingerers will pretend to have trouble on almost all assessments, even those assessments that are deceptively easy for those with a true disability/impairment (LeBourgeois III, 2007). Such deceptively easy tasks are ones where individuals with a true cognitive or physical impairment will do quite well despite the assumption from the average person that they would perform poorly (Larrabee, 2012). As an example, researchers who study traumatic brain injury (TBI) have developed assessments that are able to reliably detect malingering of brain injury symptoms by measuring how many "memory" impairments a person with TBI will exhibit (Tombaugh, 1997). Malingerers will fake brain injury symptoms by making many errors, but people with a true TBI will make very few mistakes.

Several researchers have conducted studies trying to detect malingering of ADHD but they have largely been unsuccessful and/or their findings have not been replicated. Most studies have examined the use of self-report measures of ADHD symptoms to detect malingering of the disorder. While measures such as the ADHD Rating Scale, Conners Adult ADHD Rating Scale, and Barkley's Adult ADHD Rating Scale have consistently demonstrated their ability to detect ADHD, they are not, however, consistently able to differentiate between true ADHD and someone attempting to malinger (Sollman et al., 2010; Williamson et al., 2014). Williamson and colleagues (2014) looked at ADHD malingering among college students. Their study separated

participants into four groups, a neurotypical group trying their best, a neurotypical group instructed to feign (malinger) ADHD, an ADHD only group, and an ADHD group who endorsed other diagnoses as well. They found that the BAARS-IV was able to be successfully faked. Participants instructed to feign ADHD endorsed significantly more symptoms than the neurotypical individuals trying their best and their responses did not significantly differ from those with a true ADHD diagnosis. In other words, participants were able to successfully malinger ADHD and the BAARS-IV did not detect such malingering. In similar studies examining the WAIS-III (Williamson et al., 2014), the ADHD Rating Scale (Sollman et al., 2010), and the Conners Continuous Performance Test (Suhr et al., 2011), the authors were similarly unable to reliably detect ADHD malingerers.

Because of these concerns, some researchers have turned away from using self-report measures and have studied performance-based tasks instead. Tasks like the Integrated Visual and Auditory Continuous Performance Test (Quinn, 2003) and the Conners Continuous Performance Test (Suhr et al., 2011) both have shown mixed results in their ability to detect malingering. Suhr and colleagues (2011) tested if the CPT could detect participants based on what they called "noncredible responding." They looked at three groups, one being the noncredible group (malingering), one being a non-diagnosis control, and one being the ADHD diagnosis group. They found that the non-credible performance group did not perform differently than the ADHD diagnosis group on the CPT; the CPT was unable to detect malingering in this study. However, a similar study done in 2009 by Booksh and colleagues compared CPT performance for a true ADHD group, a neurotypical group, and a simulated (malingering) ADHD group. They found that the CPT was able to detect faking as the simulated ADHD group's scores were significantly worse than both the neurotypical group's and the true ADHD group's.

The lack of consistency and replicability in the literature may suggest that current assessments for detecting ADHD malingering are not fully capturing what the average college student thinks ADHD symptoms look like. Attention deficits are not the only measurable symptom that could be used to detect malingering of ADHD. Other symptoms of ADHD may also be able to detect faking of ADHD. Assessments such as the Verbal Fluency task are designed with an embedded measure of effort for executive function and have been shown to be able to detect true ADHD in some studies (Andreou & Trott, 2013).

One assessment that has not been tested much in this capacity is the Sustained Attention to Response Task (SART; Robertson et al., 1997). The SART is a computer-based assessment that measures participants' sustained attention and ability to inhibit a habitual response. To do this, the SART involves presenting a series of digits on a screen, in rapid succession, where the participant must respond as quickly and as accurately as possible to each digit, except the digit '3'.

The SART has been utilized in recent years in studies looking at ADHD participants and how their performance might differ on this assessment. Machida and colleagues (2022) found that individuals with ADHD made qualitatively different errors than someone without ADHD. Specifically, individuals with ADHD were successfully identified based on their pattern of errors. Individuals with ADHD were more likely to make both errors of commission (misses), where they pressed a button when they should be inhibiting a response, and errors of omission (false alarms), where they failed to press a button when a response is expected.

While the SART is a relatively new measure in this field, the findings of Machida and colleagues (2022) are consistent with ADHD performance on other forms of sustained attention tasks, such as the Conners Continuous Performance Task (Conners, 1995; CPT), which asks

participants to occasionally withhold responding to the letter “X”. Given the success of assessments like the CPT, it may be possible for the SART to discriminate someone who has ADHD from a neurotypical peer. As the SART is a performance-based assessment that has shown some evidence of being able to identify ADHD participants through specific response patterns, the SART was identified as an assessment with potential identify the difference between someone with a valid ADHD diagnosis and someone who is malingering.

Hypothesis

This study examined college students’ ability to successfully malinger ADHD on a variety of objective and subjective assessments. Participants were those with a valid ADHD diagnosis and neurotypical controls, half of whom were instructed to malinger ADHD on all study assessments. First, I hypothesized that malingering participants would perform differently on the SART than both neurotypical controls and participants with a true ADHD diagnosis. Specifically, I expected that malingering ADHD participants would respond more impulsively on the SART; failing to inhibit a routine response to the target ‘3’ (miss) more frequently than neurotypical controls and also more frequently than participants with a true ADHD diagnosis. Furthermore, I expected that malingering ADHD participants would withhold their response to non-target numbers (making a false alarm error) more frequently than both other groups as well.

Second, I hypothesized that individuals who attempt to malinger ADHD would perform worse than both the participants with a true ADHD diagnosis and the neurotypical control group on two neuropsychological assessments, one that is typically used for detecting malingering of executive function symptoms (Verbal Fluency) and another that is typically used for detecting malingering of memory symptoms (Word Choice Test). Specifically, while I did not expect

performance differences between groups on the memory-based Word Choice Test, I did expect that those malingering ADHD would score lower on the Verbal Fluency assessment than both neurotypical controls and those with a true ADHD diagnosis.

Finally, I also hypothesized that participants attempting to malinger ADHD would endorse more ADHD symptoms and attention failures than the neurotypical control groups on two subjective measures, the Attention Related Cognitive Errors Scale (ARCES) and the Barkley Adult ADHD Rating Scale (BAARS-IV). However, I did not expect their subjective responses on the questionnaires to differ from the true ADHD group.

CHAPTER II

METHOD

Participants

A total of 78 college students participated in this study. Both undergraduate and graduate students were recruited through the Department of Psychology's SONA system at the University of Tennessee at Chattanooga (UTC). Of the 78 participants, 25 participants self-identified as having an ADHD diagnosis and were labeled as the true ADHD, non-malingering group. The 53 remaining neurotypical participants (without ADHD) were randomly assigned into two groups: an experimental group told to malinger, and a control group given standard instructions about task performance. The 27 participants in the non-ADHD control group and the 25 participants in the true ADHD control group were asked to try their best on all assessments they completed. The 26 in the experimental group were asked to try to "fake" ADHD on the assessments. Completion of all assessments took approximately one hour. To incentivize participants to do their best at the task assigned to them, participants were granted three participation credits through the SONA system.

Measures

Neuropsychological Measures

This study included two neuropsychological assessments, one that can be used to detect malingering of executive function symptoms (Verbal Fluency) and another that is typically used

for detecting malingering of memory symptoms (Word Choice Test). The Word Choice Test is a subtest of the Wechsler Adult Intelligence Scale – Fourth Edition (WAIS-IV; Wechsler, 2008). The Word Choice Test begins with the participant being shown 50 words, one at a time, with the researcher reading each word out loud to the participants. For each word, participants are asked to identify if the word is natural or man-made (i.e., snow, table, horse). After seeing all 50 words, participants are then shown a single laminated page with 50 pairs of words listed (i.e., snow shadow, house ball, horse time). Participants must choose which word they were shown previously from each pair. The word that the participant chooses is documented by the researcher. The participants' final score is calculated by how many words they were able to correctly identify.

The second neuropsychological assessment that was used is the Verbal Fluency task from the Delis Kaplan Executive Function System (D-KEFS; Delis, Kaplan, & Kramer, 2001). The Verbal Fluency task consists of three trials where participants are asked to list as many words as they can think of that begin with a specific letter. Participants are instructed that they may say any word beginning with the target letter, but they should not say any proper nouns, numbers, or words that have the same root word with a different suffix. Participants have 60 seconds to respond to each letter, and their responses are recorded on paper in 15 second intervals by the researcher. For this assessment, participants' final scores result in two pieces of data, one being the number of correct responses to each letter, and the other being the number of error responses to each letter (words repeated or that broke one of the rules given to the participant).

Subjective Measures

This study also included two subjective questionnaires, one that is used in the general population to measure frequency of attention errors in daily life (ARCES) and another that is typically used for detecting attention and hyperactivity symptoms in individuals who are suspected to have ADHD (BAARS-IV). The ARCES (Carriere, Cheyne, & Smilek, 2008) is a brief 12-item self-report questionnaire that is designed to determine how often a participant experiences attention-related errors in their everyday lives (Appendix B). The items cover a range of attention-related tasks, such as forgetting to complete a task or losing objects like keys or a wallet. For each statement, participants are asked to rate how often they experience that particular attention-related error on a five-point Likert scale ranging from "1 - Never" to "5 - Very Often."

The BAARS-IV (Barkley, 2011) is widely used for the identification and diagnosis of ADHD by professionals in the field (Appendix C). The assessment contains 30 self-report items that are separated into five sections. Each section contains questions that pertain to a specific aspect of ADHD. Section One has nine questions regarding the participant's level of inattention, Section Two has five questions addressing levels of hyperactivity, Section Three has four questions regarding the participant's level of impulsivity, Section Four has nine questions that measure the participant's level of sluggish cognitive tempo (SCT), and Section Five has three questions that address the participant's frequency and duration of symptoms throughout their lives. Sections One through Four are answered on a four-point Likert scale from "1 - Never or Rarely" to "4 - Very Often." Section Five includes one Yes/No question, one short answer, and one select all that apply question.

Scoring the BAARS-IV results in a total of five scores for each participant. These scores are: Total ADHD Score, Inattention Symptom Count, Hyperactivity-Impulsivity Symptom Count, Total ADHD Symptom Count, and the SCT Symptom Count. The Total ADHD Score is obtained by adding the scores of Sections One through Three together. The remaining scores relating to symptom count are calculated by counting how many times a participant responded with a 3 or 4 in the relevant section. The Total ADHD Symptom Count is found by adding the Section One through Three symptom count.

One exploratory subjective measurement was included in this study. The Knowledge of Attention Deficit Disorder in College Students Questionnaire (KADD-CS; Sciutto, Terjesen, & Bender Frank, 2000) was used to assess the general knowledge and misconceptions college aged students have about ADHD. I designed this questionnaire based on the Knowledge of Attention Deficit Disorder Scale (KADDS; Sciutto, Terjesen & Bender Frank, 2000), which examines the knowledge and misperceptions that teachers have about ADHD. The KADDS assesses three areas of knowledge. These areas include general information such as the prevalence rates, the symptomology and diagnostic process, and the treatment methods of ADHD. The assessment contains 39 questions, which are all answered by selecting True, False, or Don't Know.

To utilize this measurement effectively, I obtained permission from Sciutto to revise the KADDS to better fit the target population of this study. As the original KADDS was aimed at assessing teacher's knowledge, all questions were worded to specifically address school age children (i.e., "ADHD children are frequently distracted by extraneous stimuli"). For the revised version I used in this study, the questions were re-worded to be aimed more at college-aged individuals (i.e., "ADHD individuals are frequently distracted by extraneous stimuli"). Apart from the revision of items to avoid mention of "children" all other aspects of the assessment

remained unchanged. The KADDS-CS results in three scores: the number of correct responses, the number of "Don't Know" responses, and the total number of incorrect responses (the sum of incorrect True/False responses and "Don't Know" responses).

Sustained Attention to Response Task

The last experimental measure used in this study was the SART (Robertson et al., 1997). The SART is a task created to assess an individual's ability to maintain continuous attention on a single task without lapses. The SART is administered on a computer and the total test time is five minutes. When completing the SART, participants are shown a series of digits, 1 through 9, for 250 milliseconds, with a mask image of a circle with an X inside following each digit for 900 milliseconds. Throughout the task, participants are instructed to respond, by pressing the spacebar on the keyboard, to every digit that appears. However, they are instructed to withhold their response when the digit displayed is '3'. When the target digit '3' appears, participants are not to press the space bar or any other key. All digits are presented in white on a black background and in varying sizes. The SART begins with 18 practice trials. Following the practice portion, 225 digits are displayed where 25 are target trials. Throughout the task participants are instructed to give equal importance to both speed and accuracy when responding.

Scoring the SART results in several performance indicators, namely, hits, misses, false alarms, response time, error response time, and overall accuracy percentage. Hits reflect how many times the participant correctly inhibited their response when a target ('3') is displayed. Misses count how many times a participant failed to inhibit to a target by pressing the spacebar when a target was displayed. False alarms refer to the frequency of a participant inhibiting a response to a non-target digit. Participant response times are also informative indicators. Overall

response times to non-target trials are averaged for each participant and error response times are averaged for target trials where an error/miss was committed.

Procedure

Participants for this study signed up anonymously though the online SONA portal. On the day of the study, participants would arrive at the Assessing Cognition Laboratory, where they were greeted by the researcher and began the study (Appendix A). Once the participant was ready to begin, they were first informed on the nature of the study and asked to answer if they are currently seeking a diagnosis of ADHD or have already been diagnosed with ADHD. Any participants who responded "Yes" were placed in Group One. If the participants answered "No", they were randomly assigned to Group Two or Group Three. Once assigned to a group, participants were asked to click a tab on the computer that correlated to their assigned group. Each tab linked to a Qualtrics form with the appropriate instructions for their group. Participants were told to carefully read and respond to the informed consent and the instructions. Participants in the true ADHD group and the neurotypical control group were given the following instructions:

> "As you complete this study, imagine that this is an extra credit assignment for a class where you are behind. You wouldn't want to rush and make mistakes if you have the opportunity to improve your grade. Please try your best to complete each task to the very best of your ability" (Appendix D).

Participants placed in the malingering group were given different instructions, as seen below:

> "Imagine you are failing a class. You heard from your friend that if you had ADHD, you could get extra testing time and medication to help you enhance your performance in class. To receive these benefits, you must be able to complete assessments as if you had ADHD. Using the information provided above, please complete all following tests as though you are trying to convince the test giver that you truly have ADHD" (Appendix D).

Once informed consent was obtained and the researcher confirmed that the instructions were read and understood, participants completed the assessments in the following order: Word Choice Test, ARCES, Verbal Fluency, SART, BAARS-IV, and KADD-CS. Of these assessments, all were completed on the computer except for the Word Choice Test and Verbal Fluency, which were administered by the researcher. Upon finishing these assessments, participants completed a brief questionnaire (Appendix E) where they were asked to describe how they completed the assessments and what instructions they were given. They also answered a couple of questions regarding why they think someone might try to fake ADHD. Before leaving, participants were debriefed and asked if they had any questions regarding the study they had participated in.

CHAPTER III

RESULTS

Data from a total of 78 participants was analyzed. My analyses focused on whether participants who tried to malinger ADHD would perform significantly differently than true ADHD or neurotypical control participants on the SART and neuropsychological measures and endorse more ADHD symptoms on subjective measures. Each assessment's performance indicators were analyzed using an analysis of variance (ANOVA) between the three groups, with the addition of Tukey's HSD post-hoc tests as needed to determine which groups significantly differed.

SART Performance Indicators

Consistent with the first hypothesis, where I predicted that malingering ADHD participants would respond more impulsively on the SART by committing more misses than neurotypical controls and those with a true ADHD diagnosis, a significant main effect of SART misses was found, $F(2, 75) = 5.09$, $p = .008$, $\eta^2 = .12$ (Figure 1). Further post-hoc analyses showed that the malingering group made significantly more misses ($M = 14.73$, $SD = 5.77$) than the neurotypical control group ($M = 9.26$, $SD = 6.11$), $p = .008$, and the difference between the true ADHD group and the neurotypical control group ($M = 13.12$, $SD = 7.34$) approached significance ($p = .084$). No significant difference in SART misses was found between the true ADHD participants and malingering participants, $p = .64$

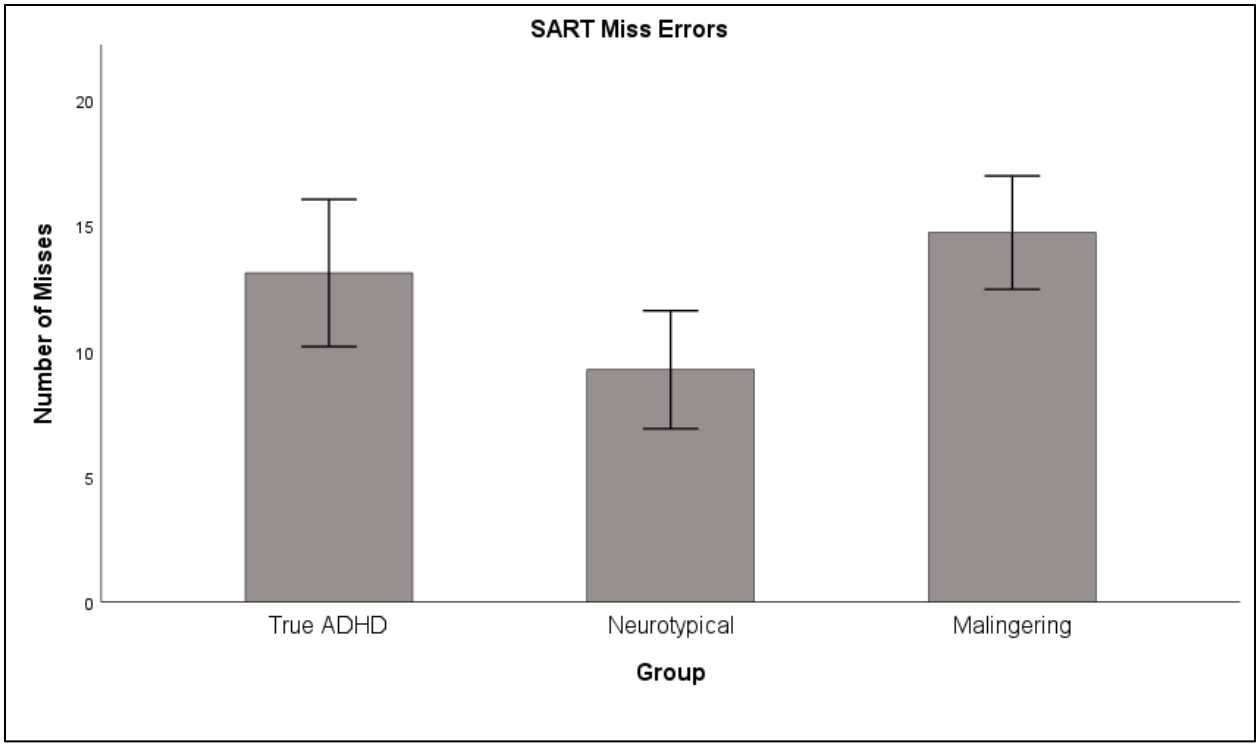

Figure 1 Mean Number of SART Misses across Experimental Groups

Note. The error bars represent the standard error of the mean.

I had also expected that malingering ADHD participants would commit more SART false alarms than both other participant groups, and indeed a significant main effect was also found for the false alarm performance indicator, $F(2, 75) = 3.85$, $p = .026$, $\eta^2 = .09$ (Figure 2). Malingering ADHD participants withheld their response to a non-target more often ($M = 9.73$, $SD = 9.53$) than the true ADHD group ($M = 4.20$, $SD = 7.22$) and the neurotypical controls ($M = 4.63$, $SD = 6.94$). The difference between malingerers and the true ADHD participants was significant, $p = .04$, and the difference between malingerers and neurotypical controls approached significance, $p = .058$. Finally, there was no significant difference in false alarms between the true ADHD group and the neurotypical control group, $p = .98$.

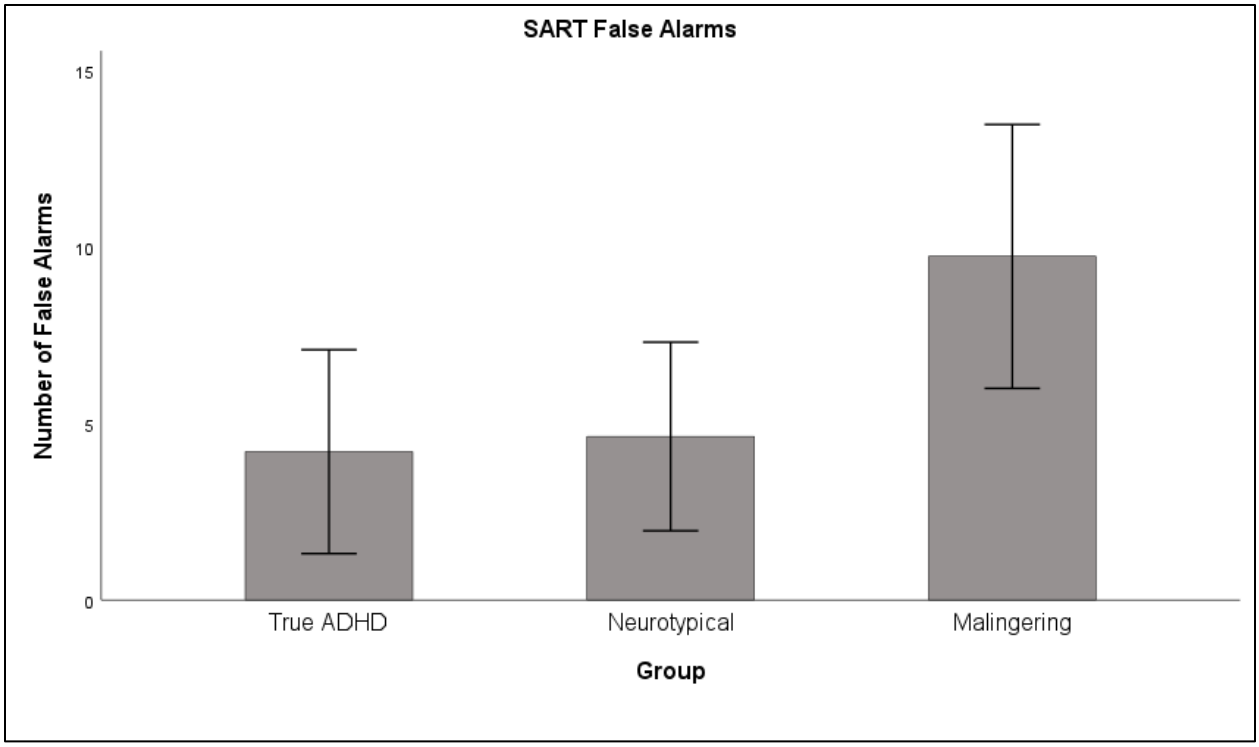

Figure 2 Mean Number of SART False Alarms across Experimental Groups

Note. The error bars represent the standard error of the mean.

Neuropsychological Indicators

With respect to the neuropsychological measures, I expected that malingering individuals would fake attention-related symptoms on the Verbal Fluency assessment by producing fewer words overall in comparison to the neurotypical control group. However, contrary to that hypothesis, there was no significant main effect of group, $F(2, 75) = 0.75$, $p = .48$, $\eta^2 = .019$. All participants, regardless of their group, were able to provide approximately the same number of words across the three Verbal Fluency trials (True ADHD, $M = 36.12$, $SD = 9.93$; Neurotypical, $M = 35.93$, $SD = 9.89$; Malingering, $M = 33.38$, $SD = 6.85$).

Similarly, analysis of the data collected from the Word Choice Test showed no significant main effect of group, $F(2, 75) = 0.72$, $p = .49$, $\eta^2 = .019$. This indicates that regardless of their group assignment, all participants produced almost perfect scores on the Word Choice Test (True ADHD, $M = 49.20$, $SD = 0.82$; Neurotypical, $M = 47.33$, $SD = 9.08$; Malingering, $M = 47.50$, $SD = 5.19$).

Subjective Measures

Turning now to how participants subjectively reported on their behavior in daily life, I hypothesized that malingering participants would endorse more ADHD symptoms and attention failures than the neurotypical control group but not more than the true ADHD group. After calculating the sum of each participant's responses to the ARCES Likert scale, a three-way ANOVA did show a significant main effect of participant group, $F(2, 75) = 10.87$, $p < .001$, $\eta^2 = .23$ (Figure 3). Specifically, post-hoc analyses showed that malingering ADHD participants ($M = 45.35$, $SD = 8.70$) and those with a true ADHD diagnosis ($M = 46.56$, $SD = 6.97$) reported similar frequencies of attention-related errors, $p = .86$. However, both malingerers and those with a true ADHD diagnosis reported significantly greater frequency of attention-related errors than neurotypical controls ($M = 36.70$, $SD = 9.21$), $p < .001$.

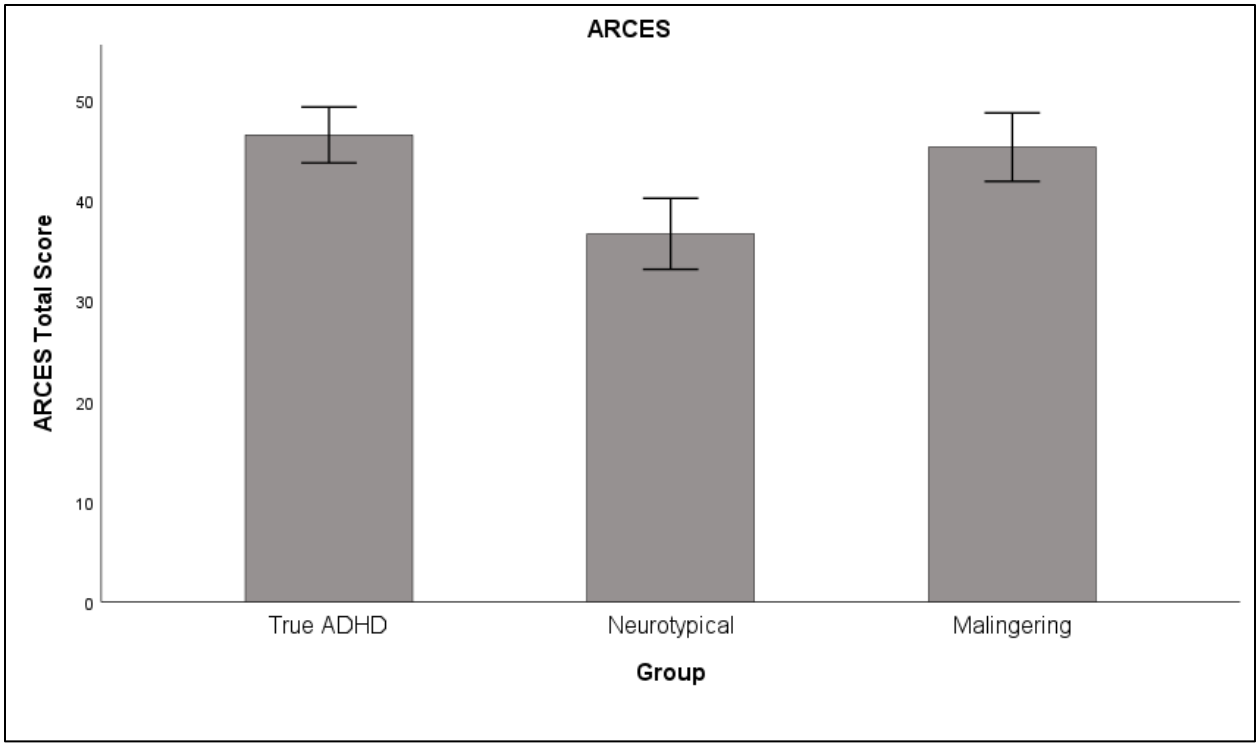

Figure 3 Mean ARCES Total Score across Experimental Groups

Note. The error bars represent the standard error of the mean.

Following the same pattern as the ARCES and supporting my hypothesis that both true ADHD participants and malingering participants would report significantly more ADHD symptoms than the neurotypical control group, a significant main effect of group was also found for participants' BAARS-IV scores, $F(2, 75) = 19.32$, $p = <.001$, $\eta^2 = .34$ (Figure 4). Again, post-hoc analysis showed significant differences in reporting of symptoms between the true ADHD group ($M = 47.80$, $SD = 9.66$) and the neurotypical controls ($M = 32.37$, $SD = 9.60$), $p < .001$, as well as between the malingering group ($M = 49.19$, $SD = 13.18$) and the neurotypical controls, $p < .001$. Symptom reporting from the true ADHD group and the malingering group on the BAARS-IV did not show a significant difference, $p = .89$.

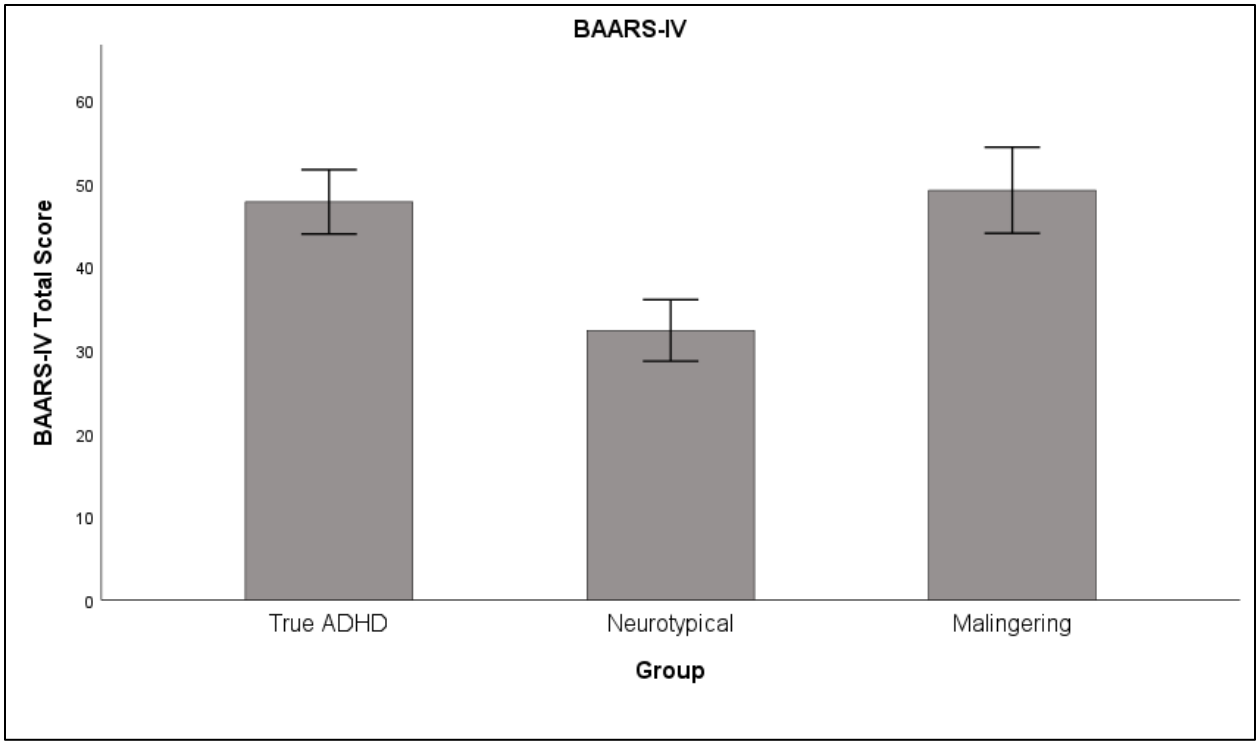

Figure 4 Mean BAARS-IV ADHD Score across Experimental Groups

Note. The error bars represent the standard error of the mean.

CHAPTER IV

DISCUSSION

The purpose of this study was to look at the performance of college students attempting to malinger ADHD on a variety of experimental, neuropsychological, and subjective assessments. Past research has shown some success in using attention-based assessments to detect ADHD (Booksh et al., 2009). However, due to the relatively new nature of this research question, the literature is somewhat sparse and inconsistent on whether these same assessments can distinguish between someone with true ADHD and someone attempting to malinger the diagnosis. Based on the current literature, this study employed several measures to test my hypotheses: that 1) both true ADHD participants and malingerers would commit more miss errors on the SART but only ADHD malingerers would commit more false alarm errors; 2) that participants trying to malinger ADHD would perform worse than neurotypical controls on both the Word Choice Test and Verbal Fluency while true ADHD participants would only score lower on Verbal Fluency, and finally 3) that participants attempting to malinger ADHD and true ADHD participants would endorse more ADHD symptoms on both the ARCES and BAARS-IV than the neurotypical control group.

Detecting ADHD Malingering with the SART

After reviewing the data from the SART, my hypothesis was supported. There was a detectable difference in miss errors and false alarm errors between the groups. The neurotypical

controls committed an average of nine miss errors (out of a possible 25), while true ADHD participants committed closer to 13 and malingering participants committed over 14. Even more interesting were the false alarm errors, where both the true ADHD group and the neurotypical group averaged around four false alarm errors, whereas the malingering group averaged more than double, around nine.

When asked about how they completed this assessment at the end of the study, a majority of the participants who were instructed to malinger indicated that they tried to answer inconsistently by pressing the space bar too often and subsequently pressing to the target number, or conversely by looking away from the computer to seem as if they are "spacing out" or losing their attention, meaning they would not press the space bar to numbers that needed a response. While the data shows that true ADHD individuals do seem to struggle to inhibit their responses, meaning they also commit more miss errors, they do not show the same tendency to lose focus or become distracted when completing the SART. This allowed for detecting the significant difference in those scores between true ADHD individuals and malingering participants.

Neuropsychological Assessments

When looking at the results of the Word Choice Test and Verbal Fluency, I did not find any significant differences between the true ADHD, malingering, and neurotypical control groups. When looking at the Word Choice Test, out of the fifty word pairs presented to participants, true ADHD individuals did appear to be able to correctly identify a few more words on average (49.20 words) than the neurotypical control (47.33 words) and malingering group

(47.50 words). However, this was not a large enough difference to say that the Word Choice Test may be able to detect true ADHD.

Similarly, true ADHD participants were able to list slightly more words on average, across the three Verbal Fluency trials, (36.12 words) than their neurotypical peers (35.93 words) and the malingering participants (33.38 words), but not significantly more. Therefore, I was unable to support my hypothesis that individuals with ADHD would score lower on Verbal Fluency than the neurotypical controls and that malingering participants would score lower on both Verbal Fluency and Word eTest.

It is interesting to note that, although the results are not significant, the data suggests that ADHD individuals may lean towards performing better on both assessments than I expected. Both assessments showed slightly higher averages for the true ADHD group. This could indicate that there is an element of these assessments that is deceptively easy for true ADHD individuals. When asked how they completed the Word Choice Test, several true ADHD participants indicated that they "followed their instincts" when selecting the correct answer or that they did not have a strategy at all. Neurotypical control participants, on the other hand, endorsed more memorization and association strategies when trying to remember the words. This may point to fundamental differences in the ADHD versus neurotypical approach to neuropsychological tasks that may be able to better be utilized to differentiate between these groups.

Subjective Assessments

In regard to the two subjective measures used, the ARCES and the BAARS-IV, the data shows that both true ADHD participants and malingering participants scored significantly higher than the neurotypical peers when asked to report their ADHD symptoms and subjective

experiences of attention errors. This is by no means a surprising result, as self-report measures have been consistently documented in previous literature to be easier to successfully malinger (Bryant et al., 2017; Suhr et al., 2008). These subjective assessments are also highly dependent on someone's sense of struggle and how they perceive their behavior and thoughts. As there is no way to detect if someone is lying about their symptoms, neglecting to report symptoms that are present, or exaggerating symptoms that do not substantially impact their daily life, it is not a reliable or accurate way to diagnose ADHD or differentiate between individuals with true ADHD and those who malinger the symptoms for their gain.

Future Directions

After reviewing the data collected from this study, I feel there are some promising results that can be carried into future studies aimed at continuing this line of research. However, there are a few limitations that may need to be addressed when moving forward. First, I did not control for true ADHD participants who were currently taking ADHD medication to control their symptoms. This could have impacted the results of the performance-based assessments for any true ADHD participant. In future studies, I would suggest including medication controls, such as asking ADHD participants to refrain from taking any ADHD control medication for 24 hours prior to their assessment appointment. Because individuals seeking a diagnosis of ADHD would generally not have access to such medication at the time of their initial assessment, it would be most beneficial to compare potential malingering participants to unmedicated ADHD scores to get the best picture of where discrepancies may be identifiable.

There is also the possibility that, due to the frequently comorbid nature of ADHD, some participants may have had other mental health disorders that could impact their performance.

Future research should look at differentiating ADHD performance patterns from other common disabilities such as depression and anxiety. This would allow for a more comprehensive ADHD performance profile to compare to neurotypicals who are attempting to malinger ADHD.

It also should be noted that the inherent flaw in conducting research where participants are asked to try their best is that we cannot ensure that a best effort is actually made. This study provided the incentive of extra credit for participating, but it may be that there are better incentives that could be used to ensure that the best effort is put forth by all participants to ensure accurate scores.

Lastly, there is always the limitation that there could be an overlap between the participant groups. I was interested in conducting this study because of how common, and easily attainable, an ADHD diagnoses is. It is entirely possible that some participants in the true ADHD group may not legitimately experience ADHD. On the other hand, there could have been participants in the neurotypical control group who experience ADHD but do not realize it or feel comfortable revealing it. A potential future direction to address this may be to run a few assessments that are shown to detect true ADHD before selecting the participants who will be placed in each group. This would allow for more controlled group selection when administering the experimental assessments to try to detect differences between true ADHD and someone malingering ADHD.

Also, due to the anonymity of this study, we were not able to utilize demographic information of our participants to ensure that the demographics of our participants did not cause limitations. ADHD is a disorder with demographic factors, being more diagnosed in males and diagnostic rates varying depending on socioeconomic status, so without that demographic

information, we are not able to make to may assumptions or generalizations to a larger population at this time.

Conclusion

While ADHD prevalence is on the rise, there is still little in the psychological and medical literature addressing the best way to diagnose ADHD beyond a self-report approach. These subjective measures have been shown to be very easy for someone seeking a diagnosis to fake, thereby making it difficult to determine how many cases of true ADHD there are. If they receive a diagnosis of ADHD, malingering individuals stand to gain access to many potential benefits, such as school disability scholarships, performance enhancing drugs, such as amphetamines or other ADHD medication, and medical and legal disability rights under laws like the ADA.

This study seeks to add to the current literature by comparing a variety of assessments, some previously used in other studies, and some identified as new assessments that may have potential success in detecting differences in performance between true ADHD individuals and participants tasked with malingering ADHD. This study found that, like previous research has suggested, neuropsychological and subjective assessments were not able to detect a difference in true ADHD and malingering performance. However, certain performance indicators from the SART show promise for this purpose. I propose that this study shows that by analyzing both miss errors and false alarm errors committed while completing the SART, it may be possible to detect if someone is faking ADHD.

There is still much to be learned and researched when it comes to finding reliable measures that can detect someone faking ADHD, but these results bring me a level of hope for

the future as a professional in the field who strives to provide appropriate support and accommodations to students who deserve the same chance at success as their neurotypical peers. I can only hope that my research adds to the current literature in a way that will positively impact mine and other's ability to support the students who truly need it in the years to come. I also fervently hope that my findings can, in some small way, make it easier for others with ADHD to find accessibility services and accommodations in places where they may have been previously competing for support with people who did not rightfully require it.

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APPENDIX A

TESTING ORDER

Testing Order	Time
1. Informed Consent	5 min
2. Reading of ADHD Simulation or Do Your Best Information	10 min
3. Pearson Word Choice Test	5 min
5. Attention-Related Cognitive Errors Scale (ARCES)	5 min
6. Delis-Kaplan Executive Function System (DKEFS) Verbal Fluency	5 min
7. Sustained Attention to Response Task (SART)	5 min
9. Barkley Adult ADHD Rating Scale - IV	5 min
10. Knowledge of Attention Deficit Disorder Scale – College Student	5 min
11. Questions about ADHD Simulation or Do Your Best Information	5 min
13. Debriefing	5 min
	Total Time: 55 min

APPENDIX B

SIMULATION READINGS

GROUP 1: ADHD Do Your Best Group

For this study, you will be completing a collection of assessments. It may be tempting to rush through the assessments and not take the study seriously. We ask that you overcome that temptation and instead really try to do your best throughout these tasks. Throughout the study, please imagine that you are in a class. A class where it matters to you to succeed.

- **Pay attention** to each item from each assessment. Focus on the task at hand and try to ignore distractions – both the external distractions in the environment and the internal distractions that might occur.
- Try to **calm your body** while seated for the assessments. Take deep breaths, keep your eyes on your work.
- **Think carefully** about each item from each assessment. Be thoughtful about how you respond and the effort you put into completing your work well.

When you do your best on this assessment you:

- Read instructions carefully and notice details
- Focus attention on the task at hand
- Listen and follow through on instructions
- Are calm and deliberate with your actions
- Think through your responses before answering

As you complete this study, imagine that this is an extra credit assignment for a class where you are behind. You wouldn't want to rush and make mistakes if you have the opportunity to improve your grade. Please try your best to complete each task to the very best of your ability.

GROUP 2: Neurotypical Do Your Best Group

For this study, you will be completing a collection of assessments. It may be tempting to rush through the assessments and not take the study seriously. We ask that you overcome that temptation and instead really try to do your best throughout these tasks. Throughout the study, please imagine that you are in a class. A class where it matters to you to succeed.

- **Pay attention** to each item from each assessment. Focus on the task at hand and try to ignore distractions – both the external distractions in the environment and the internal distractions that might occur.
- Try to **calm your body** while seated for the assessments. Take deep breaths, keep your eyes on your work.
- **Think carefully** about each item from each assessment. Be thoughtful about how you respond and the effort you put into completing your work well.

When you do your best on this assessment you:

- Read instructions carefully and notice details
- Focus attention on the task at hand
- Listen and follow through on instructions
- Are calm and deliberate with your actions
- Think through your responses before answering

As you complete this study, imagine that this is an extra credit assignment for a class where you are behind. You wouldn't want to rush and make mistakes if you have the opportunity to improve your grade. Please try your best to complete each task to the very best of your ability.

GROUP 3: Neurotypical Malingering Group

For this study, you should know that attention-deficit/hyperactivity disorder (ADHD) is a brain disorder marked by an ongoing pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development.

- **Inattention** means a person wanders off task, lacks persistence, has difficulty sustaining focus, and is disorganized; and these problems are not due to defiance or lack of comprehension.
- **Hyperactivity** means a person seems to move about constantly, including in situations in which it is not appropriate; or excessively fidgets, taps, or talks. In adults, it may be extreme restlessness or wearing others out with constant activity.
- **Impulsivity** means a person makes hasty actions that occur in the moment without first thinking about them and that may have high potential for harm; or a desire for immediate rewards or inability to delay gratification. An impulsive person may be socially intrusive and excessively interrupt others or make important decisions without considering the long-term consequences.

People with symptoms of inattention, hyperactivity and/or impulsivity may often:

- Overlook or miss details, and make careless mistakes
- Have problems sustaining attention
- Not seem to listen when spoken to directly
- Not follow through on instructions
- Be forgetful in daily activities, such as chores, errands, returning calls, and keeping appointments
- Be constantly in motion or "on the go," or act as if "driven by a motor"
- Blurt out an answer before a question has been completed, finish other people's sentences, or speak without waiting for a turn in conversation

Imagine you are failing a class. You heard from your friend that if you had ADHD, you could get extra testing time and medication to help you enhance your performance in class. To receive these benefits, you must be able to complete assessments as if you had ADHD. Using the information provided above, please complete all following tests as though you are trying to convince the test giver that you truly have ADHD.

APPENDIX C

POST-ASSESSMENT QUESTIONNAIRE

Post-Assessment Questionnaire

1. In your own words, explain how you were asked to complete the assessments within this study.

2. What strategies did you use to best follow those instructions? If you are unsure which test in which, please ask the researcher for clarification.

Pearson Word Choice: _____

ARCES: _____

Verbal Fluency: _____

SART: _____

BAARS-IV: _____

KADD-CS: _____

The purpose of this study is to look at how someone who does not have AD/HD may go about trying to get diagnosed with AD/HD by faking symptoms that are often associated with the disorder. Someone who is performing below their true abilities with the specific goal to gain something, in this case a diagnosis, is engaging in a behavior known as malingering. The goal of our assessments is to look at how much college students know about AD/HD and how easily someone without AD/HD may be able to convincingly fake AD/HD on attention-based tasks and self-report questionnaires based on that knowledge.

3. What behaviors do you think a person who is trying to malinger ADHD would demonstrate?

4. Why do you think someone might try to fake AD/HD in college?

Thank you

VITA

Nicolas Maynard was born December 28, 1993 in Lebanon, TN to Eric and Kerri Maynard. He attended the University of Tennessee at Chattanooga beginning in 2012 and graduated with his Bachelor of Science in Psychology in 2016. He continued his education in the Assessing Cognition Lab within the Research Psychology graduate program, while also working as the Access Coordinator for Testing and Communication Access in the Disability Resource Center at the University of Tennessee at Chattanooga. He will graduate August 2024 with his Master of Science in Psychology.