2014

EFFECTS OF COACHING IN THE DETECTION OF MALINGERED ATTENTION DEFICIT/HYPERACTIVITY DISORDER IN A COLLEGE SAMPLE

Maryanne Edmundson
University of Kentucky, m.s.edmundson@gmail.com

STUDENT AGREEMENT:

I represent that my thesis or dissertation and abstract are my original work. Proper attribution has been given to all outside sources. I understand that I am solely responsible for obtaining any needed copyright permissions. I have obtained needed written permission statement(s) from the owner(s) of each third-party copyrighted matter to be included in my work, allowing electronic distribution (if such use is not permitted by the fair use doctrine) which will be submitted to UKnowledge as Additional File.

I hereby grant to The University of Kentucky and its agents the irrevocable, non-exclusive, and royalty-free license to archive and make accessible my work in whole or in part in all forms of media, now or hereafter known. I agree that the document mentioned above may be made available immediately for worldwide access unless an embargo applies.

I retain all other ownership rights to the copyright of my work. I also retain the right to use in future works (such as articles or books) all or part of my work. I understand that I am free to register the copyright to my work.

REVIEW, APPROVAL AND ACCEPTANCE

The document mentioned above has been reviewed and accepted by the student's advisor, on behalf of the advisory committee, and by the Director of Graduate Studies (DGS), on behalf of the program; we verify that this is the final, approved version of the student's thesis including all changes required by the advisory committee. The undersigned agree to abide by the statements above.

Maryanne Edmundson, Student

Dr. David T. R. Berry, Major Professor

Dr. David T. R. Berry, Director of Graduate Studies

EFFECTS OF COACHING IN THE DETECTION OF MALINGERED ATTENTION DEFICIT/HYPERACTIVITY DISORDER IN A COLLEGE SAMPLE

DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
College of Arts and Sciences
at the University of Kentucky

By

Maryanne Edmundson

Lexington, Kentucky

Director: Dr. David T. R. Berry, Professor of Psychology

Lexington, Kentucky

2014

ABSTRACT OF DISSERTATION

EFFECTS OF COACHING IN THE DETECTION OF MALINGERED ATTENTION DEFICIT/HYPERACTIVITY DISORDER IN A COLLEGE SAMPLE

College students may feign symptoms of ADHD to gain access to stimulant medications and academic accommodations. Research has shown that it can be difficult to discriminate malingered from genuine symptomatology, especially when evaluations are based only on self-report. The present study investigated whether the average student given no additional information could feign ADHD as successfully as those who were coached on symptoms. Similar to Jasinski, Harp, Berry, Shandera-Ochsner, Mason, & Ranseen (2011) and other research on feigned ADHD, an extensive battery of neuropsychological, symptom validity, and self-report tests was administered. Undergraduates with no history of ADHD or other psychiatric disorders were randomly assigned to one of two simulator groups: a *coached* group which was given information about ADHD symptoms or a *non-coached* group which was given no such information. Both simulator groups were asked to feign ADHD. Their performance was compared to a genuine ADHD group and a nonclinical group asked to respond honestly. Self-report, neuropsychological, and effort test performance is discussed in the context of the effect of coaching and regarding its implications for ADHD evaluations.

KEYWORDS: Attention Deficit/Hyperactivity Disorder, Malingering, Assessment, Coaching, ADHD Baseline Knowledge.

Maryanne Edmundson .

July 17, 2014 .

EFFECTS OF COACHING IN THE DETECTION OF MALINGERED ATTENTION DEFICIT/HYPERACTIVITY DISORDER IN A COLLEGE SAMPLE

By

Maryanne Edmundson

David T. R. Berry, Ph.D.
Director of Dissertation

David T. R. Berry, Ph.D.
Director of Graduate Studies

July 17, 2014

ACKNOWLEDGMENTS

This dissertation, while an independent research project, benefited greatly from the direction and encouragement of several key individuals. I would first like to thank my Dissertation Chair, Dr. David Berry, for his instruction and support throughout all stages of this project. I would also like to thank my Dissertation Committee members and outside reader, Doctors Richard Milich, Mark Fillmore, Fred Danner, and Alan DeSantis, for their helpful feedback throughout the project. Additionally, I would like to thank members of my research laboratory, Jordan Harp, Hannah Combs, Kimberly Williams, Stephanie Rojas, Ande Williams, Ahmed Saleh, and April Scott for their assistance with data collection.

Finally, this project would not have been possible without the love and support I have received from family and friends. My fiancé, Craig, encouraged me whenever I doubted in myself, supported me through difficult times, served as a partner with whom I could discuss ideas, and reminded me to laugh whenever things got too serious – without you, my love, the road to completing this project would have been long and grueling. I also thank my parents, Marsha and Patrick, and grandmother, Rebekah, who taught me the value of working hard, persevering, and remaining intellectually curious, all while maintaining a sense of humor about myself and the world – skills which have been required in ample amounts throughout my higher education. My sister, Arwen, I thank for being a level-headed advice-giver and purveyor of fun. My best friend, Eileen, I thank for being a second sister and constant source of comfort, opening me to new perspectives on life, and being a role-model of compassion and wisdom. Ladies of my class, Jennifer, Jessica, Melissa, Rachel, and Regan: we supported each other along through laughter and tears, and it was a privilege to earn my degree by your sides. My hooping sisters, Sonya and Paige, I thank for always being there for serious talks or to let loose together, and always helping me learn a more spiritual way of being.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter One: Introduction

Attention deficit/hyperactivity disorder (ADHD) is a psychiatric condition that interferes with functioning. However, the treatments and accommodations provided to individuals with ADHD, such as stimulant medications and extra testing time, are desirable to many college students because of the perception that they can improve anyone's academic performance (Advokat, 2010). This gives individuals a potentially strong incentive to feign ADHD in clinical evaluations. Thus, it is essential that clinicians be able to distinguish between individuals with true ADHD and individuals who are feigning the condition. Moreover, information about ADHD symptoms is easily attainable, particularly on the internet. The ease with which this information can be accessed may make it possible for individuals to feign ADHD without difficulty, or possibly without prior study, particularly on self-report measures. Thus, the present study seeks to investigate individuals' knowledge of ADHD and whether coaching is required for individuals to successfully feign ADHD, as well as to replicate previous research on the use of neuropsychological and symptom validity testing to identify individuals feigning ADHD.

Disorder Characteristics

ADHD is described in the American Psychiatric Association's (APA) *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) as a psychological disorder characterized by persistent inattention, hyperactivity, and/or impulsivity that significantly interferes with functioning (APA, 2013). Individuals with ADHD may be diagnosed with one of three subtypes: inattentive, hyperactive/impulsive, or combined.[1] The *predominantly inattentive type* is characterized by six or more symptoms of inattention, such as distractibility and forgetfulness, while the *predominantly hyperactive/impulsive type* is characterized by six or more symptoms of hyperactivity and impulsivity, such as excessive talking and fidgeting (Note. Only 5 or more inattentive or hyperactive/impulsive symptoms are required for diagnosis in individuals aged 17 or older). The *combined type* is diagnosed when six or more symptoms from both the inattentive and hyperactive/impulsive categories are present. To meet the diagnostic criteria for ADHD, symptoms must be present for at least six months, in at least two settings (e.g., home and school), have an onset before age twelve,[2] and cause significant impairment in social, academic, and/or occupational functioning.

---

[1] Note that these subtypes and their associated diagnostic criteria have not changed from the DSM-IV-TR (APA, 2000) to the DSM-5 (APA, 2013).

[2] The age of onset for ADHD was raised from 7 (DSM-IV-TR; APA, 2000) to 12 (DSM-5; APA, 2013). As this is a recent change, measures of ADHD that ask about the age of onset, including those used in the present study, continue to refer to the DSM-IV-TR age criterion.

Research over the past two decades has shown that ADHD is not confined to childhood but may persist into adulthood (Quinn, 2003). Current estimates of adult ADHD suggest base rates of approximately 2.5–4% for the general adult population (Simon, Czobor, Bálint, Mészáros, & Bitter, 2009; Wilens, Faraone, & Biederman, 2004) and 0.5–8% for college students (Weyandt & DuPaul, 2006). Just as in the case of children, adults diagnosed with ADHD experience pervasive functional problems. For example, they are more likely than their peers to have relationship problems and/or few friendships, to have been treated for sexually-transmitted disease, to have lower socio-economic status, to use tobacco or illicit drugs, and to underachieve in academic and occupational settings (Advokat, 2010; Barkley et al., 2002; Barkley, Fischer, Smallish, & Fletcher, 2006). As college students, adults with ADHD have more difficulty adjusting to campus life, poorer study skills, and lower grade point averages than their classmates (Norwalk, Norvilitis, & McLean, 2009).

Typical ADHD Evaluation Procedures. Accurate diagnosis of child ADHD requires a comprehensive evaluation of pathological symptoms, related functional impairment, pervasiveness of symptoms and impairment, and age at onset, as well as a process of ruling out other conditions (APA, 2013; Davidson, 2008; Jasinski & Ranseen, 2011). The optimal practice is to use multiple assessment strategies and gather information from multiple raters (Davidson, 2008). For the evaluation of children and adolescents, it has been recommended that ADHD assessment include a detailed clinical interview, completion of established rating scales (self-, parent-, and/or teacher-report), behavioral observation at school and/or home, neuropsychological evaluation of attention, impulsivity, intellectual functioning, and any other function that would aid the evaluator in differential diagnosis, and medical examination (e.g., Pliszka et al., 1997; Quinn, 2003; Sollman, Ranseen, & Berry, 2010; Wender, 1995).

Diagnosis in Adults. While the DSM-5 allows for initial diagnoses of ADHD to be made in adults (APA, 2013), accurately diagnosing ADHD in this age range is hampered by several diagnostic and assessment issues. First, it is difficult to verify that an adult's symptoms were present since childhood (Faraone et al., 2007; Harrison, 2006). Second, adults may not be able to accurately recall their childhood impairment, have a hard time judging whether impairments were more extreme than that of their peers, and/or tend to underestimate their own ADHD-related impairments on self-report measures (Harrison, 2006; Manor et al., 2012). Third, adults may lack documentation of early impairments (e.g., report cards or school evaluations) and rarely attend evaluations accompanied by significant others who have knowledge of their childhoods (e.g., parents, siblings; Quinn, 2003). Fourth, many adults are diagnosed with ADHD on the sole basis of matching self-reported symptoms with DSM criteria (Harrison, 2006). Given the potential for

inaccuracies in adults' self-reports of ADHD symptoms (see the "Detecting Malingering" subsection below), use of single self-report measures to diagnose the condition may be unreliable. Finally, some researchers assert that the DSM criteria for ADHD may not be developmentally sensitive to the impairment experienced by adults. For example, some clinical manifestations of ADHD said to occur in adults, like procrastination, are not represented in the DSM criteria, the level of impairment may appear different in adults compared to children, the wording of criteria and examples in the DSM-IV may relate more to children than adults, and the diagnostic thresholds may be too restrictive for adults (Davidson, 2008). While some of these issues have been addressed in the DSM-5 (e.g., adult-related symptom examples have been added and separate diagnostic thresholds now exist for children vs. adolescents/adults; APA, 2013), at the time of this writing established ADHD measures do not yet reflect these changes.

Malingering

Increasingly, malingering is being recognized as a potentially significant problem in clinical evaluations of ADHD (Harrison, 2006). In fact, it has been suggested that malingering may be partially responsible for the difficulty inherent in diagnosing adult ADHD (Quinn, 2003). The DSM-5 defines malingering as "the intentional production of false or grossly exaggerated physical or psychological symptoms, motivated by external incentives" (APA, 2013, p. 726). Base rates of malingering are difficult to obtain since malingerers rarely confess. However, the prevalence of malingering is thought to rise in situations where there is potential for secondary gain, such as in the context of litigation or compensation-seeking (Zasler & Martelli, 2003). The prevalence of malingered ADHD in collegiate settings has been estimated to be 10–20% of cases referred for ADHD evaluation where external incentives are present (Harrison, 2006; Musso & Gouvier, 2012). Increases in the base rates of adult ADHD and awareness of malingering have led to greater recognition of potential exaggeration or fabrication of ADHD symptoms (Harrison, 2006).

Incentives for Malingering. College students have many incentives, or potential benefits they may receive, if they successfully feign ADHD. These include academic accommodations, medications with cognitive-enhancing effects, and stimulant medications for recreational use (Advokat, 2010; McCabe, Knight, Teter, & Wechsler, 2005). Young adults may have difficulty transitioning from high school to college due to increases in workload, responsibility, and competition (Kane, 2008), which may in turn cause feelings of pressure and heightened fear of failure. Thus, average students experiencing increased academic strain may view students with ADHD as having a seemingly easier time completing assignments and tests because of special accommodations, such as extra time on exams and assignments, separate testing, access to

instructor notes, lighter workloads, financial aid, and electronic aids (Harrison, 2006). Accordingly, they may attempt to feign ADHD in a clinical evaluation in order to receive these accommodations (Musso & Gouvier, 2012).

Individuals diagnosed with ADHD are frequently prescribed stimulant medications (Advokat, Guidry, & Martino, 2011), due to these drugs' ability to improve sustained attention (Advokat, 2010). A large proportion of university students with and without an ADHD diagnosis (over 75% in one survey; Advokat et al., 2011) believe that ADHD medications improve academic performance by increasing alertness, improving concentration and intellectual performance, and increasing efficiency. In several large surveys, 5–43% of college students without ADHD have reported using stimulant medications without a prescription, with higher rates of illicit use seen in colleges with more competitive admission standards (see Advokat et al., 2011). One survey of non-prescription stimulant use among college students also found that large proportions of respondents with ADHD had either been asked to give (84%) or sell (54%) their medication to a student who did not have ADHD (Advokat et al., 2011). The lure of a steady source of stimulants that could be obtained more cheaply than street value may also motivate some college students to feign ADHD in order to obtain a prescription (Quinn, 2003; Sullivan, May, & Galbally, 2007).

Individuals may also feign ADHD to acquire stimulant medications for recreational use (Conti, 2004). According to McCabe, Teter, and Boyd (2006), illicit use of prescription drugs is a growing problem among undergraduate students. Quintero (2009) found 90% of the college population studied reported poly-drug use involving pharmaceuticals. In two separate surveys, recreational stimulant use was reported by 16% of college students (Babcock & Byrne, 2000) and 8% of college students without an ADHD diagnosis (Advokat et al., 2011). Estimates of recreational stimulant abuse have risen in recent years (Booksh, Pella, Singh, & Gouvier, 2010; Musso & Gouvier, 2012). A more troubling aspect of these drugs is that they may be inhaled or injected, serving as a prescription alternative to cocaine, or used in combination with other drugs, such as alcohol and other psychoactive substances, to intensify the stimulants' effects or prolong feelings of euphoria (Harrison, 2006). These practices have risk of serious health complications, such as seizures, movement disorders, ischemia, and/or organ failure (Ciccarone, 2011; Klein-Schwartz, 2002; Parran & Jasinski, 1991). Thus, it has grown increasingly important to have objective ways to detect malingering in ADHD evaluations to prevent the acquisition and misuse of prescription stimulant medications.

Detecting Malingering. Researchers have begun to recognize the importance of understanding and detecting malingering. Thus far, research on malingering has focused primarily on the feigning of severe psychopathology (e.g., psychosis), specific cognitive impairments (e.g., amnesia), or conditions potentially causing cognitive impairment (e.g., mild traumatic brain injury; Rogers, 2008). The study of malingered ADHD is still in the developmental phase, with the majority of studies on this topic having been published in the last 15 years.

Tools for the detection of malingering vary depending on the issue being assessed. Detection of feigned psychopathology typically involves structured interviews or embedded validity scales within questionnaires that assess indiscriminant symptom endorsement, endorsement of rare, obvious, improbable, or contradictory symptoms, unusual symptom combinations, and/or extreme symptom severity (Rogers, 2008). However, structured interviews for the detection of malingering tend to focus on Axis I disorders other than ADHD (e.g., psychosis, mood disorders; Rogers, 2008). While research supports the use of embedded validity scales to identify "fake bad" response styles, very few ADHD rating scales are equipped with validity scales to detect feigning (Bracken & Boatwright, 2005; Suhr, Buelow, & Riddle, 2011). Given its extensive supporting research, some researchers have evaluated the usefulness of the Minnesota Multiphasic Personality Inventory (MMPI) in ADHD evaluations, either by creating ADHD-relevant scales (Gordon, 2003) or by evaluating the effectiveness of the validity scales at detecting individuals asked to feign ADHD (Harp, Jasinski, Shandera-Ochsner, Mason, & Berry, 2011; Young & Gross, 2011).

The symptom validity test (SVT) is a widely accepted strategy used to detect malingering and suspect effort. SVTs are stand-alone measures that typically employ a two-item, forced-choice paradigm where the target stimulus is initially presented, after a short delay the target stimulus and a novel stimulus are presented side-by-side, and the examinee must select the target stimulus from the two choices (Willison & Tombaugh, 2006). More recently, researchers have developed embedded SVTs, which are malingering indices derived from established neuropsychological measures and test batteries (e.g., the Reliable Digit Span within the Wechsler Adult Intelligence Scale [WAIS]; Jasinski, Berry, Shandera, & Clark, 2011). SVTs have been the driving force in malingering test development and research because they have demonstrated moderate sensitivity to malingering and high specificity to test performances of full effort (Willison & Tombaugh, 2006).

Research studies examining malingering within ADHD evaluations have utilized known-groups, differential prevalence, or simulation designs. In known-groups designs, researchers

identify a group of dissimulators using a specified criterion or set of criteria, such as failure on a specific SVT, and compare their performance to individuals with the condition under study who are responding honestly (Rogers, 2008). While this design has the most real-world generalizability, its usefulness is contingent on the ability of the researchers to accurately classify individuals as malingering, which as noted earlier is difficult since malingerers rarely confess. In differential prevalence designs, the researcher compares two different groups of individuals that are assumed to have different base rates of malingering (Rogers, 2008), most often due to the presence vs. absence of potential external gain or perceived incentives. Typically, the differential prevalence design compares compensation-seeking with non-compensation-seeking groups. However, in this design no attempt is made to determine the actual base rate of dissimulation present within each group, leading researchers to view it as "a poor substitute to the known-groups comparison" (Rogers, 2008, p. 17). In the simulation design, participants are asked to complete a test battery while attempting to feign symptoms of a given disorder (i.e., a *simulation* group). Their performance is then compared to that of honestly responding normal participants and/or honestly responding individuals who have the clinical condition under study (Rogers, 2008). This design is appealing in that it allows for systematic comparison among criterion groups and controlled experimental manipulation, though there is concern regarding its real-world generalizability (Rogers, 2008). Thus, researchers have attempted to increase the external validity of simulation studies by providing clear malingering instruction with information on relevant symptoms, presenting a scenario describing a hypothetical real-world situation in which they would receive external benefits if they were to successfully malinger deficits, allowing preparation time, warning participants to feign believably, providing tangible incentives such as monetary rewards for successful feigning, and, post-experiment, checking that malingerers understood and cooperated with their instructions to feign (Rogers, 2008).

Known-Groups Design. Several studies investigating effort level in ADHD evaluations have utilized the known-groups design. In one such archival study, Marshall and colleagues (2010) examined SVTs' effectiveness in identifying symptom exaggeration. Participants who completed a referred ADHD evaluation were placed retrospectively into one of four groups: ADHD credible, non-ADHD credible, ADHD suspect, and non-ADHD suspect. Participants were classified as exhibiting suspect effort if they (1) failed two SVTs, (2) failed one SVT and gave an unusually impaired performance on a cognitive test, or (3) failed a single SVT or appeared unusually impaired on a cognitive test and had invalid completion on behavior rating scales. Results indicated sensitivities to suspect effort of 47–64% for the b Test E-score, the Test of Variable Attention (TOVA) reaction time variability, the Conners' Continuous Performance Test-

II (C-CPT) omission errors, the TOVA omission errors, and the Word Memory Test (WMT) consistency and immediate recall scores, in ascending order (Marshall et al., 2010). Additionally, their groups with suspect effort tended to endorse the same level of ADHD symptoms as the credible ADHD group, with the exception of higher ratings of inattention from the suspect effort groups.

Three studies utilizing known-groups designs have classified sub-optimal effort or non-credible performance based solely on failure of the WMT (Suhr, Hammers, Dobbins-Buckland, Zimak, & Hughes, 2008; Suhr, Sullivan, & Rodriguez, 2011; Sullivan et al., 2007). In both ADHD and learning disorder evaluations, Sullivan et al. (2007) found 47.6% of individuals exhibited suboptimal effort based on this criterion. Analyses of individuals evaluated for ADHD-only indicated the suboptimal effort group produced significantly worse scores on the Immediate Recognition, Short-Delay Recall, and Long-Delay Recall trials of the California Verbal Learning Test (CVLT-II), and higher scores on the Conners' Adult ADHD Rating Scale (CAARS; Sullivan et al., 2007).

Suhr et al. (2008) compared a non-credible performance group (based on failure of at least one WMT subtest) with an ADHD group and a psychological symptoms control group on neuropsychological test performance. The non-credible group performed significantly worse than both clinical control groups on all trials of the Auditory Verbal Learning Test (AVLT), the WAIS-III Working Memory Index, and the Trail Making Test Part B. Both the non-credible group and ADHD controls performed significantly worse than the psychological symptoms controls on the Stroop Color-Word interference T-score (Suhr et al., 2008). Suhr, Sullivan, et al. (2011) later extended these findings, using a subset of their original sample, to examine the C-CPT. The non-credible group performed significantly worse than psychological symptoms controls on many C-CPT scores, including omissions, commissions, reaction time, discriminability, reaction time variability, and reaction time change over interstimulus intervals, but was only differentiated from the ADHD control group by the latter two variables (Suhr, Sullivan, et al., 2011).

Differential Prevalence Design. Pella, Hill, Shelton, Elliot, & Gouvier (2012) used the differential prevalence design to evaluate diagnoses and accommodations to examinees and the performance of 11 embedded SVTs within the WAIS-III and Wechsler Memory Scale-III (WMS). Using archival data from self-referred evaluations for "academic problems," Pella et al. (2012) classified individuals as either seeking external incentives (i.e., having explicitly expressed an intent to obtain academic accommodations or stimulant medications as the result of evaluation) or not seeking external incentives (i.e., no explicit statement of intent to obtain such

incentives). Both groups were also compared to a nonclinical control group. Using cut scores with high specificity rates for malingering from studies of a variety of clinical groups (e.g., traumatic brain injury, pain, psychiatric, mixed neurologic), the authors found that the External Incentives and No External Incentives groups differed on only three embedded SVTs: Auditory Recognition-Delayed Raw, the Mittenberg Index, and Reliable Digit Span. While a higher percentage of the External Incentives group failed at least one embedded SVT (46.3%), a rather large percentage of the No External Incentives group (36.8%) also failed at least one embedded SVT, which casts doubt on the usefulness of their "external incentive statement" criterion for group classification. In fact, all individuals who seek evaluations due to academic problems, by nature of the evaluation context, potentially have external incentives, whether or not they explicitly state intent to obtain them or have genuine or malingered symptoms within evaluations. However, when Pella et al. (2012) examined their sample in terms of classification of malingered neurocognitive dysfunction using the Slick Criteria (a known-groups comparison), they found that individuals meeting malingering criteria were more likely to have been erroneously diagnosed with a neurocognitive disorder (including ADHD, learning disorder, and cognitive disorder NOS).

Simulation Design. The simulation design has been utilized in several studies examining malingered ADHD with various types of measures, including self-report instruments, tests of neuropsychological functioning, and SVTs. Many studies (Fisher & Watkins, 2008; Harp et al. 2011; Jachimowicz & Geiselman, 2004; Young & Gross, 2011) have found that individuals can feign ADHD on self-report rating scales with relative ease. A study by Jachimowicz and Geiselman (2004) showed that 65–95% of malingerers with no significant history of ADHD were able to successfully score positively for ADHD on the Wender Utah Rating Scale, ADHD Rating Scale, CAARS, and Brown Adult ADHD Scale. Of the individuals with no significant history of ADHD instructed to simulate in a study by Fisher and Watkins (2008), 93% of those who completed the College ADHD Response Evaluation (CARE) and 77% of those who completed the ADHD Behavior Checklist successfully feigned ADHD after studying ADHD diagnostic criteria for only five minutes. However, neither of these studies compared the simulators' level of symptom endorsement with that of individuals known to have ADHD. Young and Gross (2011) compared a nonclinical group asked to feign ADHD with individuals diagnosed with ADHD and a nonclinical control. Results indicated that the ADHD and malingering groups did not differ significantly in their symptom endorsement on the ADHD Current and Childhood Symptoms Scales, though both groups endorsed a greater number and higher severity of symptoms than non-clinical controls. Similarly, Harp et al. (2011) found that ADHD simulators and honest ADHD

participants obtained similar scores on most CAARS scales, though simulators endorsed more symptoms on the Hyperactivity-Restlessness and Self-Concept scales.

Frazier, Frazier, Busch, Kerwood, and Demaree (2008) investigated the ability of SVTs, including the Victoria Symptom Validity Test (VSVT) and the Validity Indicator Profile (VIP), to distinguish normal undergraduate participants from those instructed to simulate ADHD and reading disorder. Results indicated these two measures were able to differentiate simulated ADHD and reading disorder from normal controls with sensitivity rates generally above 80% (Frazier et al., 2008). However, this study is limited by its lack of comparison to clinical groups.

Several studies have compared the performance of controls, simulated malingerers, and participants with ADHD on self-report and neuropsychological measures (Booksh et al., 2010; Harrison, Edwards, & Parker, 2007; Quinn, 2003). Quinn (2003) compared these groups on the Integrated Visual and Auditory Continuous Performance Test (IVA-CPT) and the ADHD Behavior Checklist. Quinn found no significant differences between participants with ADHD and simulators on the ADHD Behavior Checklist, providing further evidence that simulators are able to successfully feign ADHD on self-report rating scales. However, 81% of the scales on the IVA-CPT could not be successfully feigned, and the IVA-CPT exhibited 94% sensitivity to malingering with specificity of 91% (Quinn, 2003). Booksh et al. (2010) examined performance on self-report rating scales and objective measures of attention. Their simulation group performed significantly worse than the ADHD group on the Trail Making Test Part A, C-CPT mean T-scores, and the sum of C-CPT elevations (Booksh et al., 2010). Simulators also reported significantly higher levels of current ADHD symptoms than the ADHD group on the Attention Deficit Scales for Adults self-report measure. In a study by Harrison et al. (2007), undergraduate participants completed the CAARS and the Reading Fluency and Processing Speed subtests from the Woodcock Johnson Psychoeducational Battery-III (WJPB-III). Using the CAARS' recommended cut score, most participants in the simulation group met criteria for a diagnosis of ADHD, though they trended toward higher scores than the ADHD group. Additionally, simulators performed significantly worse on WJPB-III subtests using a liberal cut score (Harrison et al., 2007). Based on these results, the authors suggest that very high scores on CAARS items along with unusually low scores on standardized tests, such as the WJPB-III, may help identify individuals feigning ADHD (Harrison et al., 2007).

Three studies have used more comprehensive test batteries to compare the performance of simulated malingerers with various control groups (Jasinski, Harp, et al., 2011; Sollman et al., 2010; Williamson, 2013). Sollman et al. (2010) compared ADHD simulators with ADHD controls and normal controls on self-report scales, neuropsychological measures, and feigning

and symptom validity tests. Self-report scales included the ADHD Rating Scale (ARS) and the CAARS. Neuropsychological measures included the C-CPT, Stroop Color-Word Test, WMS-III Word Lists subtest (WMS-WL), and Nelson-Denny Word Reading Test (NDWR). Tests of effort and feigning included the Miller Forensic Assessment of Symptoms Test (M-FAST), a psychiatric feigning measure, and several symptom validity tests, including the Digit Memory Test (DMT), Letter Memory Test (LMT), Test of Memory Malingering (TOMM), and Nonverbal-Medical Symptom Validity Test (NV-MSVT). In this study, self-report scales were highly sensitive to genuine ADHD, but did not accurately differentiate malingered ADHD from genuine ADHD. For neuropsychological measures, simulators performed significantly worse than ADHD controls on the Stroop Word and Color mean scores and on contrast 2 of the WMS-WL (Sollman et al., 2010). The C-CPT was insensitive to ADHD in Sollman and colleagues' sample – their performance did not differ from that of controls; however, the simulation group generated typical ADHD profiles. Analysis of the SVTs indicated the TOMM, DMT, LMT, and NV-MSVT produced moderate sensitivity to feigning and good specificity for ADHD, with effect sizes ranging from -0.96 on Scale A of the NV-MSVT to -1.6 for Trial 1 percentage correct on the TOMM (Sollman et al., 2010).

In an extension of Sollman et al.'s (2010) findings, Jasinski, Harp, et al. (2011) compared the test performance of ADHD malingerers with an honest nonclinical control group, an ADHD honest group, an ADHD group asked to exaggerate their symptoms, and a mood disorder group. Participants completed the CAARS, the Reading Fluency subtest of the Woodcock-Johnson Test of Achievement-III (WJ-III), the Computerized Test of Information Processing (CTIP), the Coding, Symbol Search, and Digit Span subtests of the WAIS-IV, and SVTs including the DMT, LMT, TOMM, NV-MSVT, and b Test (Jasinski, Harp, et al., 2011).[3] Similar to previous research, CAARS scores were not significantly different for the feigning and honest ADHD groups. For the neuropsychological measures, the WJ-III (d = -1.27 – -1.25) and many of the CTIP variables (d = 0.82–1.01) were able to discriminate feigned from honest ADHD (Harp, 2010). Additionally, the WAIS-IV Processing Speed Index and Symbol Search subtest distinguished malingerers from honest responders (d = -1.47 and -1.52, respectively). Analyses of the SVTs indicated the TOMM, DMT, LMT, and NV-MSVT differentiated the malingering group from the honest ADHD group by nearly one standard deviation. Effect sizes ranged from -1.01 to -1.24 with malingerers exhibiting significantly worse performance on all the SVTs.

[3] WJ-III, CTIP, and WAIS-IV data are found in Harp (2010).

Williamson (2013) further extended the work of Sollman et al. (2010) and Jasinski, Harp, et al. (2011) by compared the test performance of ADHD malingerers with an honest nonclinical control group, an honest group with only ADHD, and an honest group with comorbid diagnoses of ADHD and either a learning or anxiety disorder. Participants completed virtually the same battery as in Jasinski, Harp, et al. (2011), with the addition of the Wechsler Test of Adult Reading (WTAR) and the CAARS replaced by the Barkley Adult ADHD Rating Scale-IV (BAARS). Similar to previous research, BAARS scores were comparable for the feigning and honest ADHD groups, with the exception of malingerers obtaining significantly higher Hyperactivity Index scores. For the neuropsychological measures, the CTIP Simple and Choice subtest median reaction times (d = 1.14–1.82) discriminated feigning from honest ADHD for both ADHD groups (Williamson, 2013). However, the WAIS-IV Processing Speed Index (d = -1.02) and WJ-III (d = -1.33) only distinguished malingerers from honest responders with ADHD only and not those with comorbid diagnoses. As with Jasinski, Harp, et al., SVT analyses showed the TOMM, DMT, LMT, and NV-MSVT differentiated malingerers from the both honest ADHD groups by nearly one standard deviation. Effect sizes ranged from -0.83 to -1.41 with malingerers exhibiting significantly worse performance on all the SVTs.

Based on these investigations of malingered ADHD, several recommendations can be made for ADHD evaluations. Since self-report measures are unable to adequately differentiate malingered ADHD from true ADHD, they should not be the sole instruments used in ADHD assessments (Fisher & Watkins, 2008; Harrison, 2006; Quinn, 2003). Several studies (e.g., Harp, 2010; Harrison et al., 2007; Jasinski, Harp, et al., 2011; Sollman et al., 2010; Williamson, 2013) provide evidence for the combined utility of symptom validity tests, neuropsychological measures, and self-report measures in the evaluation of adult ADHD.

Knowledge of ADHD

Information about ADHD can be gathered from many sources. Parents of children with ADHD and adolescents with ADHD have reported seeking information about the disorder from such sources as health professionals, teachers, books, medical journals, newspapers, magazines, health brochures, television, and friends and relatives (Bussing, Gary, Mills, & Garvan, 2007; Bussing et al., 2012). Also, direct-to-consumer advertising for psychotropic medications, which has increased dramatically over time, has raised public awareness of psychiatric conditions (Timko & Chowansky, 2008). In fact, a survey of physicians revealed that 23% of their patients had asked about a specific psychological disorder or psychotropic medication because they had heard about it through advertising (Timko & Herbert, 2007). Additionally, individuals can find an abundance of information about ADHD more easily on the internet than using other methods. A

simple internet search for “ADHD” returns a plethora of websites (e.g., nih.gov, cdc.gov, wedmd.com, Wikipedia.org) with detailed information about ADHD, including symptoms, diagnostic criteria, subtypes, diagnostic evaluation procedures, and/or treatments. A survey by Bussing et al. (2012) found that parents and adolescents had utilized the internet to gather material about ADHD and that this was their preferred source for this information. Moreover, direct-to-consumer advertising has increasingly utilized online social media platforms, such as Facebook and Twitter (Liang & Mackey, 2011). Given the sheer volume of available sources of information about ADHD, one would expect that the general public has at least some idea of its symptoms.

Only a handful of studies has investigated the United States general public’s knowledge of ADHD (Bussing et al., 2007; McLeod, Fettes, Jensen, Pescosolido, & Martin, 2007; Pescosolido et al., 2008). In a survey of community volunteers by McLeod et al. (2007), 64% had heard of ADHD, 33% were able to describe basic symptoms of ADHD (e.g., impulsivity, hyperactivity), and 16% knew someone with ADHD. A survey of individuals drawn from a community school district by Bussing et al. (2007) found even higher rates of knowledge of ADHD. In their sample, 87% had heard of ADHD, 31% reported knowing “a lot about it,” 35% reported knowing “some about it,” and 76% knew someone with ADHD. Unfortunately, Bussing et al. (2007) did not assess individuals knowledge of specific ADHD symptoms. Pescosolido et al. (2008) asked community volunteers to listen to a vignette about a child with ADHD, depression, subclinical psychological issues, or asthma and then asked open-ended questions about what was wrong with the child depicted. For the ADHD vignette, about 42% correctly identified the disorder depicted and about 46% correctly identified that the child had a mental illness. These studies suggest that individuals in the general public have at least some knowledge of ADHD.

Moreover, the survey by McLeod et al. (2007) indicated individuals with more education were more likely to have heard of ADHD and younger individuals were more likely to know specifics about the symptoms of ADHD. Since college students are both young and pursuing higher education, it is likely that they will tend to have heard of ADHD and have some knowledge of its symptoms without having to do any external research. In fact, prior to their coaching manipulation, Fisher and Watkins (2008) assessed undergraduates’ knowledge of ADHD. In their sample, 78% reported having some knowledge of the symptoms of ADHD, 10% said they had a “thorough understanding of the characteristics of ADHD,” and less than 1% had never heard of ADHD. If Fisher and Watkins’ sample is representative of most college

populations,[4] their results suggest a high proportion of college students will have specific knowledge of ADHD that may be used to successfully malinger the disorder.

Coaching. While the above studies suggest college students may have a baseline knowledge of ADHD, studies have not tended to assess whether they would be able to successfully malinger ADHD without coaching. Indeed, ADHD simulation studies frequently give their malingering groups easily accessed information about the disorder prior to their simulation manipulation (e.g., Fisher & Watkins, 2008; Harp et al., 2011; Jasinski, Harp, et al., 2011; Jachimowicz & Geiselman, 2004; Sollman et al., 2010; Young & Gross, 2011). These studies have shown that individuals can successfully malinger ADHD, particularly on self-report measures, even after studying ADHD symptoms for only short periods of time (e.g., 5 minutes; Fisher & Watkins, 2008).

In real-world evaluations, coaching is a potential issue. It is likely that a genuine malingerer in a real life situation would seek out information on the disorder being feigned prior to undergoing testing. In fact, 19% of college students diagnosed with ADHD have been asked by a peer how to fake ADHD symptoms (Advokat et al., 2011). Additionally, a study by Tan, Slick, Strauss, and Hultsch (2002) suggested undergraduates who are given time to prepare to simulate brain dysfunction tend to seek out information to help them fulfill their role: 75% of individuals asked to feign spent at least some time preparing and 44% spent at least an hour preparing.

Moreover, research suggests individuals motivated to feign a disorder or exaggerate existing symptoms have access to information that would help them do so believably (Suhr & Gunstad, 2007), including undergoing multiple evaluations within medicolegal evaluations, obtaining information from attorneys, and searching the internet. In the context of ADHD evaluations, the latter may be the most common source of real-world coaching, as individuals undergoing ADHD evaluation do not usually do so as part of legal proceedings. Moreover, college students may be most likely to consult internet sources when preparing to malinger in an evaluation. Tan et al. (2002) found that a higher percentage of undergraduates asked to simulate brain dysfunction used the internet to help them prepare (36%) than any other source, including talking to friends (28%) or family (24%), reading books or articles (16%), talking to a psychologist or doctor (8%), getting ideas from TV (4%), or consulting a lawyer (0%). Conducting internet searches for information about psychological and neuropsychological

[4] Though Booksh et al. (2011) also assessed college students' knowledge of ADHD, they did not report the level of their participants' knowledge (e.g., having only heard of ADHD vs. having knowledge of specific symptoms). Rather, Booksh et al. reported that their control and ADHD malingering groups reported "similar knowledge of ADHD" (p. 332).

evaluations, Ruiz, Drake, Glass, Marcotte, and van Gorp (2002) revealed that 2–5% of sites posed direct threat to test security because they detailed tests used in medicolegal evaluations, examples of test stimuli, tests' detection strategies, and advice on how to respond to test items to receive disability benefits. A further 20–25% of sites posed an indirect threat to test security in that they listed the names of malingering instruments, specific signs of malingering, and general methods to avoid detection of malingering (Ruiz et al., 2002). Bauer & McCaffrey (2006) examined the test security threat posed by the internet for the TOMM, VSVT, and WMT, three popular SVTs. They found 26% of the sites identified posed a moderate-to-high threat to test security because they provided information that could be used to avoid detection, such as the tests' format and purpose, typical reactions of malingerers vs. non-malingerers to verbal feedback about their responses, and cutoff scores that determine suboptimal performance (Bauer & McCaffrey, 2006).

Many studies have examined the effects of coaching within studies of malingered head injury (see Suhr & Gunstad, 2007), but results have been mixed. In studies examining self-report scales, coaching focused on symptoms (i.e., providing information about head injury symptoms) or warnings about malingering detection tools. These studies found coached and non-coached simulators tended to report the same number of symptoms and were detected by validity indices equally well. In studies examining SVTs, coaching took the form of symptom coaching, providing information about test-taking strategies, symptom coaching plus a warning about malingering detection tools, or symptom coaching plus information about test-taking strategies. When only one form of coaching was used SVTs more often detected both coached and non-coached simulators equally well, though a few studies found coached participants were able to avoid detection better than non-coached simulators or performed worse than non-coached simulators. However, when multiple coaching strategies were used, malingerers were much more likely than non-coached malingerers to be successful in their ability to simulate head injury without being detected by SVTs (Suhr & Gunstad, 2007). It should be noted that most of the SVT studies reviewed by Suhr and Gunstad (2007) administered either a single SVT measure or a group of SVTs rather than administering SVTs within a more extensive battery. It is possible that the rates of detection by SVTs for coached vs. non-coached simulators may be different when using a more comprehensive test battery.

To this author's knowledge, only two studies have examined the ability of non-coached simulators to feign ADHD symptoms. The first by Tucha, Sontag, Walitza, and Lange (2009) compared symptom endorsement on the Brown Attention Deficit Disorder Scale for Adults (BADDS), a self-report scale, for a non-coached simulation group, a coached simulation group, an ADHD group, and a nonclinical control group. Coaching consisted of providing the DSM-IV

diagnostic criteria for ADHD and asking questions about the criteria to ensure participants understood them. Both coached and non-coached simulators were instructed to feign in a realistic, but not obviously exaggerated, way. Results showed no significant differences between the two simulation groups. Additionally, neither simulation group differed from the ADHD group on the BADDS Total Score or most of the subscale scores (Tucha et al., 2009). The one exception was that both simulation groups scored higher than the ADHD group on the subscale that measured problems with sustained attention and concentration.

A recent study by Rios and Morey (2013) compared self-reported symptom endorsement on the CAARS and adolescent version of the Personality Assessment Inventory (PAI-A) by 17−18 year-olds in either a non-coached simulation group, a coached simulation group, or an ADHD group. The PAI-A assesses psychopathology, but not ADHD; it was examined in this study because it includes several validity scales and might be administered in ADHD evaluations to rule out other psychological conditions. About 45% of their simulators successfully feigned ADHD on the CAARS, with no significant difference between coached and non-coached simulators regarding success of feigning (Rios & Morey, 2013). The PAI-A Positive Impression Management, Negative Impression Management, and Rogers Discriminant Function validity indicators effectively detected both coached and non-coached simulators. Moreover, simulators were more likely than individuals in the ADHD group to endorse psychopathology across all PAI-A scales. These two studies' results suggest individuals can successfully feign ADHD on self-report measures without prior coaching if those measures do not have validity scales to assess exaggeration. This is in line with prior research, which shows self-report measures are particularly susceptible to feigning. At present, it is unknown if SVTs and neuropsychological measures can differentiate between coached and non-coached malingered ADHD groups.

Study Design and Hypotheses

The current study employed a simulation design, utilized a protocol similar to that used in Jasinski, Harp, et al. (2011), and included three main groups: an honest-responding ADHD group (ADHD), a nonclinical coached malingering group (CM), and a nonclinical non-coached malingering group (NM). Additionally, a fourth group consisting of 9 nonclinical honestly responding individuals (NH) was included as a manipulation check. These groups were examined to satisfy two aims. First, this study sought to determine if coaching (i.e., providing information about ADHD symptoms) is necessary for college students to successfully "fool" diagnostic measures for ADHD. Second, the Adult Knowledge of Attention Deficit Disorder Scale (AKADDS; Watkins & Reilley, 2009) was administered as a pre-test measure to determine participants' baseline knowledge of ADHD.

Based on prior research on ADHD and malingering, several hypotheses were posited for the present study. First, it was thought that the CM and NM groups would perform significantly worse on neurocognitive tests and symptom validity tests than the ADHD group. Second, the CM and NM groups were expected to endorse more ADHD symptoms on the self-report measure than the ADHD group. Third, it was anticipated that the SVTs, including the Word Memory Test (WMT), Digit Memory Test (DMT), Letter Memory Test (LMT), and Test of Memory Malingering (TOMM), would be the most sensitive to malingered ADHD. Fourth, it was hypothesized that the CM and NM groups would perform similarly on the self-report measure and, perhaps, on all measures. However, since the NM group, unlike the CM group, were not provided a list of ADHD symptoms, it was possible that the NM group would show less consistent symptom production than the NM group. Fifth, although the Barkley Functional Impairment Scale (BFIS) and other measures of functional impairment have not been included as test measures in studies of malingered ADHD, it was expected that impairment would be endorsed on the BFIS by the ADHD and CM groups, as the ADHD group would likely have genuine impairment and the CM group would study information about ADHD which discusses functional impairment as a characteristic of ADHD. It was unclear how the NM group would respond to the BFIS: it was possible they would only endorse academic dysfunction more than other functional areas, as laypeople often know ADHD impairs academic endeavors.

Chapter Two: Method

Participants

The present sample included 76 undergraduate participants: 21 participants with ADHD diagnoses and 55 nonclinical participants. The nonclinical subsample included individuals with no history of diagnosed or suspected ADHD or other psychiatric disorders. Twenty-three of the nonclinical participants were randomly assigned to a coached malingering group (CM), 23 to a non-coached malingering group (NM), and 9 to an honest condition (NH). The NH group functioned as a manipulation check for the assessment protocol. The clinical subsample included 21 individuals with verifiable ADHD diagnoses (ADHD) and no history of co-occurring psychiatric disorders. A phone interview was used to establish that ADHD diagnoses were received from or verified by a mental health practitioner prior to age 18 and were not based solely on either self-reported symptoms and/or a brief consultation. Individuals were excluded from the study if they were younger than 18, older than 30, or had any history of learning disorders, severe brain injury, or neurological disorders. Individuals with a remote history of concussion were allowed to participate. Demographic characteristics of the sample (e.g., age, gender, race) approximated that of the larger undergraduate population at the University of Kentucky.

Procedure and Materials

Recruitment and Screening. Participants were primarily recruited from the Psychology Mass Screening session, based on their responses to an ADHD screening measure which asked students to indicate whether they had been diagnosed with ADHD, included ADHD-related questions (e.g., medications, accommodations, familial diagnoses), and inquired about neurological and psychiatric diagnoses. Additional ADHD participants were recruited through flyers placed in Kastle Hall (the Department of Psychology building), the University of Kentucky Office of Disabilities, and the Jesse G. Harris Psychological Services Center. All potential participants were contacted by the primary investigator or a research assistant to complete a brief phone interview. The phone interview was utilized to discern whether individuals wished to participate in the study, whether they met the inclusion and exclusion criteria, and which group assignments were most appropriate given individuals' psychiatric history (i.e., ADHD vs. one of the nonclinical groups). Individuals who met inclusion criteria were invited to participate in the in-person testing session. At the end of the phone interview, participants in the ADHD group were asked to abstain from stimulant medication use for 12 hours prior to testing so their testing performance would reflect that of individuals with untreated ADHD. Both the screening measure and phone interview were administered under standard instruction. All participants received a reminder phone call 24 hours before their scheduled in-person testing time.

Overview of In-Person Testing Session. In-person testing sessions were conducted on an individual basis and completed on the University of Kentucky campus. Two examiners (designated here as *RA1* and *RA2*) were present for each testing session. RA1 administered the consent, pre-test measures, group assignment instructions, post-test measures, and debriefing. For the ADHD group, RA1 also ascertained that these participants did, in fact, abstain from stimulant medication use for the 12 hours prior to testing. RA2, who was blind to participants' assigned condition, administered the test battery in a counter-balanced manner. Each testing session, including pre- and post-testing and the main test battery, took approximately 3.5–4 hours. Participants were allowed breaks throughout the session.

Pre-Test. First, informed consent was obtained from all participants. The informed consent form provided participants with information about the study, including risks and benefits of the study, and required participants' signatures before beginning the in-person study procedures. The pre-test consisted of administration of the Adult Knowledge of Attention Deficit Disorder Scales (AKADDS), a background information form (which included the Adult ADHD Self-Report Scale [ASRS]), the Wechsler Test of Adult Reading (WTAR), and group instructions, in that order. All of the pre-test measures were administered under standard instructions before specific group instructions were given (with the exception of disguising the true purpose of the ASRS, detailed below).

Adult Knowledge of Attention Deficit Disorder Scale (AKADDS; Watkins & Reilley, 2009). The AKADDS, which evaluated participants' preexisting knowledge of ADHD, was administered prior to any measures or instructions that included information on the symptoms of ADHD to ensure participants' responses accurately reflected their baseline knowledge of ADHD. The AKADDS is a 37-item questionnaire which measures respondents' knowledge of ADHD. Its three subscales measure knowledge of ADHD's (1) diagnosis and symptoms, (2) treatment, and (3) associated features. Each item is rated True or False if respondents are certain they know the correct answer or Don't Know if they are unsure of the answer. The measure is made up of items asking about characteristics of ADHD intermixed with reverse-scored foils (i.e., items with inaccurate information about ADHD for which the correct answer is false). The AKADDS has demonstrated acceptable internal consistency for the total scale ($\alpha = 0.82$) and subscales ($\alpha = 0.62-0.65$; Watkins & Reilley, 2009; Dahmane & Reilley, 2009).

Background Information Form. The background information form asked individuals to provide information about demographics (age, race, gender, etc.), psychiatric diagnoses and treatment, and other relevant information (e.g., whether they had repeated a grade). The background information form also included the Adult ADHD Self-Report Scale (ASRS; Kessler

et al., 2005), which was administered to gauge current ADHD symptoms. The ASRS is an 18-item self-report measure for ADHD which covers 18 DSM-IV ADHD symptoms. It has shown adequate sensitivity (56.3%) and strong specificity (98.3%), and a 96.2% overall hit rate (Kessler et al., 2005). Under standard administration, the ASRS would have alerted participants that it is a measure of ADHD symptoms and, thus, could be considered a method of indirect coaching. This would have been particularly problematic for the non-coached malingering group, as they were asked to feign ADHD using only their prior knowledge of ADHD. Therefore, the ASRS was combined into the background information form in order to disguise the fact that it is a measure of ADHD symptoms.

Wechsler Test of Adult Reading (WTAR; Wechsler, 2001). The WTAR was administered to estimate global intelligence and discern any group differences in intelligence. It requires individuals to pronounce a list of 50 increasingly difficult words and takes approximately 5–10 minutes to administer. The WTAR has shown resistance to neurologic injury and disorders, so it is frequently used as a measure of premorbid cognitive functioning (Wechsler, 2001). Pearson correlations of the WTAR total score with the WAIS-III Full Scale IQ are 0.70 and 0.74 for the age groups of 18–19 and 20–24, respectively (Wechsler, 2001). Strong correlations have been found between the WTAR total score and the WAIS-III index scores, the greatest of which were for Verbal IQ ($r = 0.74$ and 0.79, respectively, for the age groups previously specified). Strong internal consistency (split half Spearman-Brown corrected correlations, $r = 0.90–0.92$ for ages 18–34) and test-retest reliability ($r = 0.92$ for ages 18–29) have been found for the WTAR (Wechsler, 2001).

Group Instructions. The ADHD and NH groups were instructed to respond honestly, giving their best effort throughout the test battery. Participants in both malingering groups (CM and NM) were instructed to respond to measures in the test battery as if they were attempting to receive a diagnosis of ADHD, without presenting themselves as obviously feigning. All malingering participants were offered a conditional incentive of $20 if they successfully simulated ADHD without being detected. In reality, all malingering participants received this monetary compensation during the debriefing session, as required by the Institutional Review Board. Additionally, all malingering participants were given a scenario describing a situation where it would be to their benefit to successfully feign ADHD and receive a diagnosis based on their test results. This scenario did not mention specific symptoms of ADHD. The malingering groups' instruction differed in that the CM group participants were asked to study a list of common symptoms and presentations of ADHD easily accessible via the internet (taken from Jasinski, Harp, et al., 2011), whereas the NM group participants did not receive this additional

information. Finally, all malingering participants were asked to repeat their given instructions to ensure they understood their role.

Test Battery. The test battery was administered under standard instruction for the ADHD and NH groups and was given under instruction to malinger ADHD for the NM and CM groups. This battery consisted of the Word Memory Test (WMT), Digit Memory Test (DMT), Letter Memory Test (LMT), Test of Memory Malingering (TOMM), b Test, Computerized Test of Information Processing (CTIP), Conners' Adult ADHD Rating Scale (CAARS), Barkley Functional Impairment Scale (BFIS), and Wechsler Adult Intelligence Scale-IV (WAIS-IV) Digit Span, Coding, and Symbol Search subtests. The order of administration was randomized, with the exception of the CAARS. Since the CAARS is clearly a measure of ADHD symptoms, it was administered after all other test measures so participants were not provided cues as to the symptoms that should be feigned on the other test measures (i.e., indirect coaching).

Barkley Functional Impairment Scale-Long Form: Self-Report (BFIS; Barkley, 2011). The BFIS is a 15-item self-report measure of the degree of functional difficulty experienced in various psychosocial domains (e.g., work, academic activities). The Long Form of the BFIS has demonstrated excellent internal consistency ($\alpha = 0.97$) and acceptable 2-3 week test-retest reliability ($r = 0.72$ for the Mean Impairment Score). Prior research has shown high Mean Impairment Scores are related to documented difficulties in major life domains (e.g., disability status, low GPA, low credit ratings) and ADHD symptom severity ($r = 0.62$ with Barkley Adult ADHD Rating Scale total ADHD symptom score; Barkley, 2011).

Conners' Adult ADHD Rating Scale, Self-Report, Long Form (CAARS; Conners, Erhardt, & Sparrow, 1999). The CAARS is a 66-item self-report measure of ADHD symptoms. It is commonly used due to its inclusion of items and scales relating directly to DSM-IV criteria. The long form of the CAARS includes four factor-derived scales of ADHD-related symptoms (Inattention/Memory Problems, Hyperactivity/Restlessness, Impulsivity/Emotional Lability, and Problems with Self-Concept), three DSM-IV scales (Inattentive, Hyperactive-Impulsive, and Total ADHD Symptoms), and an ADHD Index containing items that best distinguish between adults with ADHD and nonclinical adults. The CAARS has demonstrated acceptable internal consistency ($\alpha = 0.64$–0.89 for 18–29 year olds) and one-month test-retest correlations ($r = 0.80$–0.91; Conners et al., 1999). While it includes an Inconsistency Index, which identifies random or careless responding, it does not contain scales to identify exaggeration or feigning of ADHD.

Word Memory Test (WMT; Green, 2003). The WMT, which is frequently used to detect individuals feigning brain damage (Green, 2003), is a computerized test with SVT and neuropsychological subtests. The test contains an encoding phase followed by six subtests – the

first two subtests are symptom validity subtests (Immediate Recognition and Delayed Recognition), while the latter four measure verbal memory and are considered neuropsychological measures (Multiple Choice, Paired Associate Recall, Free Recall, and Long-Delay Free Recall). In the encoding phase, 20 pairs of words are presented twice on the computer screen. Encoding is followed by the Immediate Recognition subtest, in which participants are shown 40 pairs of words and, from each pair, must choose the word previously seen. The task is repeated 30 minutes later, in the Delayed Recognition subtest. These two subtests are easy enough that they are considered to measure only test effort. A Consistency score is calculated by comparing performances on these two effort subtests. The four verbal memory subtests are presented in order of increasing difficulty – the easier Multiple Choice and Paired Associate subtests first, followed by the harder Free Recall and Long-Delay Free Recall subtests. Green (2003) suggests that scores below 82.5% on the Immediate or Delayed Recognition subtests or the Consistency measure are indicative of "poor effort" and potential malingering. Additionally, scores below 70% on the Multiple Choice subtest or below 50% on the Paired Associate Recall subtest may suggest poor effort for individuals who do not have dementia.

Computerized Test of Information Processing (CTIP; Tombaugh & Rees, 2000). The CTIP, a neuropsychological measure, is one of many continuous performance tasks (CPTs) commonly used in neuropsychological evaluations. It is a computerized test of sustained attention and impulsivity wherein the test taker must discriminate among stimuli as quickly as possible and respond appropriately to a target stimulus. It is comprised of three progressively difficult subtests: simple reaction time, choice reaction time, and semantic choice reaction time. The first measures simple reaction time to a specified letter on the computer screen, the second requires different responses depending on which of two words appears on the screen, and the third requires the individual to press a key to indicate if a word presented is part of a semantic category. The CTIP produces scores for omissions (i.e., misses), commissions (i.e., false positives), response time, and response time variability (i.e., coefficients of variation).

The CTIP has shown sensitivity and specificity values comparable to the commonly used Test of Memory Malingering (TOMM; Tombaugh, 1996). Norms for the CTIP are based solely on patients with TBI. In brain injury research (Willison & Tombaugh, 2006), malingerers perform significantly worse on the CTIP than controls and individuals with mild traumatic brain injury (TBI) on all subtests and significantly worse than individuals with severe TBI group on the simple reaction time subtest. Additionally, performance differences between severe TBI and simulation groups diminishes for more complex subtests. However, it is felt that the CTIP may be a useful feigning tool for ADHD given its face validity as a test of attention. Jasinski, Harp, and

colleagues' (2011)[5] study of malingered ADHD found that several CTIP variables, including the simple, choice, and semantic median reaction times as well as the simple and choice reaction time coefficients of variation may be useful in detecting feigned ADHD symptoms, with effect sizes ranging from $d = 0.82$ to $d = 1.01$. Additionally, the semantic choice reaction time subtest exhibited moderate sensitivity to malingering at 68.2% (Harp, 2010).

Digit Memory Test (DMT; Hiscock & Hiscock, 1989). The DMT is a widely-used forced-choice SVT, which some consider to be a "gold standard" (Vickery, Berry, Inman, Harris & Orey, 2001). It consists of the presentation of a five-digit number followed by an empty delay period. The individual is then asked to choose between the previously shown number and a novel five-digit number. The first block of 24 trials has a 5-second delay between the stimulus and recognition. The delay for the second and third blocks of trials is then incrementally increased to 10 and then 15 seconds, giving the illusion of increased difficulty. A cut score of <90% correct has been validated to identify inadequate motivation on the DMT (Vickery et al., 2001).

The DMT is a face-valid test of memory which is intentionally easy and relatively insensitive to brain damage. In a meta-analysis by Vickery and colleagues (2001), the DMT performed better at discriminating between honest responders and dissimulators than the Dot Counting Test, 15-Item Test, 21-Item Test, and Portland Digit Recognition Test. The 32 studies included in the meta-analysis produced combined estimates of good sensitivity (0.90 and 0.71 for sensitivity to malingering as compared to honestly responding clinical and normal individuals, respectively) and excellent specificity (0.91–0.99) for the DMT. The DMT has been used in the detection of malingered ADHD, where it demonstrated 100% specificity and 43% sensitivity (Sollman et al., 2010). In Jasinski, Harp, et al.'s study (2011), the DMT exhibited improved sensitivity of 50%, but somewhat diminished specificity of 95%.

Letter Memory Test (LMT; Inman et al., 1998). The LMT is a 45-item forced-choice SVT. It often serves as an alternative to the DMT. The test uses letters as stimuli and manipulates the apparent difficulty level by increasing the number of letters to be remembered (3, 4, or 5) and the number of choices presented along with the target stimulus (1, 2, or 3; Inman et al., 1998). The LMT has shown moderate to good sensitivity (0.64–0.80) and excellent specificity (0.95–0.98) in discriminating between individuals with TBI responding honestly and probable cognitive feigners (Schipper, Berry, Coen, & Clark, 2008; Vagnini et al., 2006). It has also demonstrated strong specificity (0.98) and adequate sensitivity (0.76) in detecting malingered neurocognitive dysfunction (Sollman & Berry, 2011). Sollman et al. (2010) examined the LMT

[5] CTIP data for Jasinski, Harp, et al. (2011) are found in Harp (2010).

for the detection of malingered ADHD and found very strong specificity (0.93) and moderate sensitivity (0.52) estimates. Furthermore, Jasinski, Harp, et al. (2011) found slightly improved estimates using the recommended cutting score of <93% (specificity = 0.96, sensitivity = 0.54).

Test of Memory Malingering (TOMM; Tombaugh, 1996). The TOMM, an SVT, was developed as an objective, criterion-based test to distinguish between individuals with genuine memory impairment and those feigning symptoms of impaired memory. The test consists of two learning trials and one retention trial. The learning trials involve both a study and test phase. During the study portion, the individual is presented with 50 line-drawn pictures (targets) for 3 seconds each with a 1 second interval between presentations. The test phase involves presentation of a previously shown target picture and a foil (a new line drawing). The examinee is then asked to identify the target drawing. The examiner gives feedback as to the accuracy of each choice. Two learning trials are followed by the retention trial consisting only of a test phase after a 15–20 minute delay.

The TOMM is a relatively simple task which can be completed successfully by people with severe TBI. Therefore, it is a good tool for malingering detection (Vickery et al., 2001). Rees, Tombaugh, and Boulay (2001) found that a 90% cutting score on the TOMM trials had high sensitivity and specificity for malingered memory deficits. Furthermore, recent studies (Jasinski, Harp, et al., 2011; Sollman et al., 2010) found the TOMM performed adequately when detecting feigned ADHD, with strong specificities (97–100%) but reduced sensitivities (45.5–47%) at Trial 2 and Retention. Jasinski, Harp, et al. also found 90% specificity and 59% sensitivity for Trial 1 Percent Correct.

b Test (Boone, Lu, & Herzberg, 2002). The b Test is a brief SVT which appears to test takers to be a measure of attention and focus. In a timed task, the examinee must identify and circle every letter “b” in a field of “d’s,” “p’s,” “q’s,” and other similarly shaped foils of varying sizes and orientations over multiple stimulus pages. Scores are based upon time to complete, errors of commission (circling a shape which is not a “b”), or errors of omission (missing a “b”). The b Test’s E score is a summary score accounting for time spent per stimulus, commission errors (including “d” errors), and omission errors. Initial validation of the b test found it resistant to traumatic brain injury, stroke, and other learning difficulties (Lezak, 2004). Errors of commission with the letter “d” appear to be a common malingering strategy, and Boone et al. (2000) found that a criterion of more than three commission errors resulted in 77% sensitivity and 100% specificity among traumatic brain injury and learning disability patients. In their study of malingered ADHD, Jasinski, Harp, et al. (2011) found that the b test E score was useful in identifying feigners, especially when combined with other symptom validity tests.

Wechsler Adult Intelligence Scale-IV (WAIS-IV) subtests: Digit Span, Coding, and Symbol Search (Wechsler, 2008). The WAIS-IV (Wechsler, 2008) is a collection of subtests measuring general intellectual functioning that provides index scores in verbal comprehension, perceptual reasoning, working memory, and processing speed. The present study included the Digit Span (forward, backward, and sequencing), Coding, and Symbol Search subtests. In Digit Span, participants repeat increasingly long strings of digits according to the given instructions. Coding and Symbol Search both measure visual-motor coordination and processing speed by asking participants to either copy symbols associated with a given number or to determine whether a set of symbols contains a target symbol, respectively (Wechsler, 2008). Additionally, the Reliable Digit Span, an embedded SVT derived from the Digit Span subtest, was calculated.

Because these particular subtests involve attention and speed, participants attempting to simulate ADHD symptoms may deliberately slow their performance (Harrison, 2006; Marshall et al., 2010). There is evidence supporting the use of the Digit Span subtest as a strong malingering detection tool in traumatic brain injury populations, with adequate sensitivity (60%) and specificity (87%) and large effect sizes (d = 1.08). Reliable Digit Span has demonstrated similar sensitivity (63%), specificity (86%), and effect sizes (d = 1.34) for detecting malingering of neurocognitive dysfunction (Jasinski, Berry, et al., 2011). The Coding and Symbol Search subtests, which comprise the Processing Speed Index of the WAIS-IV, were included because results from Jasinski, Harp, et al. (2011) and Harp (2010) indicated the WAIS-IV Processing Speed Index was selected by a statistical package as the best single predictor of feigned ADHD.

Post-Test. All post-test measures were administered under standard instruction to all participants; thus, ADHD and NH participants continued instructions to provide full effort, whereas NM and CM participants were asked to cease their attempts to feign ADHD and begin providing full effort again. The post-test included debriefing forms elaborating on the nature of the study and the necessary deception regarding the monetary incentive. A post-test questionnaire required participants to reiterate their instructions and indicate on a 5-point Likert scale how well they understood instructions, to what degree they were able to follow them, and the amount of effort put forth during testing (Note. A score of 1 indicated poor understanding, ability to follow instruction, and effort, whereas a score of 5 indicated excellent understanding, ability, and effort). Participants were then compensated for their time: those recruited through the psychology mass screening were compensated with research credits, while those recruited through flyers received $40 compensation. Upon study completion, participants were asked to keep details of the experiment confidential in order to preserve the integrity of the study's deception.

Chapter Three: Results

Given the high number of analyses performed, a *p*-level of 0.01 was used for all analyses to limit Type I error. Given their superior statistical power, parametric statistics were employed for all comparisons; however, where assumptions of normality were violated, both parametric and non-parametric analyses were performed and, where their results significantly varied, both were reported.

Sample Characteristics

Initial Subject Pool and Exclusion. A total of 1,501 undergraduates at the University of Kentucky made up the pool of potential participants, 1,480 of whom participated in the undergraduate psychology mass screening session and 21 of whom responded to recruitment flyers. As shown in Figure 3.1, 30 individuals did not provide valid contact information, 789 were called but could not be reached, 105 individuals refused participation for the reasons listed, and 489 met the exclusionary criteria listed. The remaining 88 individuals were scheduled to participate, but 10 did not keep their appointments. Main testing data from one individual were excluded because the participant endorsed a full ADHD diagnosis on the phone screening but in the main testing indicated she never met full criteria for the disorder. One NH participant produced an ASRS score that was more than 3 standard deviations above the remaining non-clinical participants and was considered an outlier; data from this participant were excluded from analyses. This left a final sample of 76 individuals with data considered valid for analysis.

As noted above, individuals in the malingering groups completed a post-test questionnaire to assess their understanding of the instructions and the effort they put into fulfilling their role. Each item was scored on a 5-point Likert scale where 1 indicated poor understanding/effort and 5 indicated excellent understanding/effort. It had been planned that individuals with responses below 4 would be considered to have inadequate understanding or effort and would be excluded from analyses. However, all individuals with scores below 4 on these items were asked to explain their ratings, which revealed many individuals in the NM group rated their understanding or effort a 3 because they were unsure how to feign ADHD believably if they had less familiarity with its signs and symptoms. Since these ratings were lower than expected due to the experimental manipulation, participants were required to score a 3 or greater on these post-test items for their data to be included in analyses. With this cutoff, no participants were excluded due to post-test ratings.

Demographic Characteristics. Of the 76 included participants in this study, 65 were recruited from the University of Kentucky Introductory Psychology course's subject pool and 14 were recruited via flyers. The final sample consisted of 21 individuals diagnosed with ADHD and

55 nonclinical individuals. The overall sample was 46.1% male with a mean age of 18.75 (*SD* = 0.97) and a mean education of 12.34 years completed (*SD* = 0.64). The racial/ethnic makeup of the sample was 82.9% Caucasian, 5.3% African-American, 3.9% Latino(a), 2.6% Asian-American/Pacific Islander, and 5.3% other ethnic identities. Additionally, 88.2% of the sample was right handed, 1.3% had repeated a grade, and none of the sample was colorblind. The majority of participants had no history of head injury (75%). However, 23.7% of participants had experienced one concussion in their lifetime, and 1.3% had experienced 2 concussions; none of the participants was currently experiencing head injury sequelae at the time of participation. The sample's average WTAR standard score was 106.07 (*SD* = 10.82), which suggests an average predicted Full Scale IQ score of 104.33 (*SD* = 7.74). Table 3.1 provides the sample's demographic breakdown by group. Using parametric analyses, participants in the four groups did not differ significantly on the demographic variables. Both age and education exhibited some skewness and kurtosis, so additional nonparametric analyses using the Kruskal-Wallis test was used to compare the groups; there were no significant group differences on these additional analyses.

Diagnostic Characteristics. Participants in the ADHD group received their diagnoses at a mean age of 11.05 (*SD* = 3.96). The majority of the ADHD group was diagnosed with the Primarily Inattentive subtype of ADHD (38.1%), whereas 23.8% had the Combined subtype, 4.8% had the Primarily Hyperactive subtype, and 33.3% did not specify a subtype. Psychiatrists diagnosed the majority of participants (42.9%). Of the remaining participants, 28.6% were diagnosed by a psychologist, 9.5% by a pediatrician, and 19% by a pediatrician with consultation from a professional whose degree was unknown to the participant. ADHD diagnosis was based on neuropsychological testing for 23.8% of the ADHD group, computerized tests of attention for 4.8%, observation of the individual completing attention-demanding tasks for 9.5%, and completing symptom questionnaires for 14.3% (Note. The latter two group's diagnoses were also based on parent-report and/or classroom observation). The most common basis for the ADHD group's diagnoses was a combination of the measures described above (47.6%). Additionally, 90.5% of the ADHD group's initial diagnostic evaluation included parent-report and 33.3% were observed in the classroom. For the ADHD group, stimulants were the most frequently prescribed ADHD medications (23.8% Adderall, 14.3% Vyvanse, 9.5% Concerta, 4.8% Ritalin, 4.8% Metadate, 4.8% Daytrana). Nineteen percent of the ADHD group was prescribed a combination of medications (9.5% multiple stimulants, 4.8% stimulant and non-stimulant, 4.8% non-stimulant and selective serotonin reuptake inhibitor) and 19% were not prescribed any medications to treat ADHD. Only 28.6% of participants in the ADHD group were receiving academic accommodations from the university, most of whom received more than one type of

accommodation (23.8% of the ADHD group). The types of academic accommodations ADHD participants were receiving included extra testing time, separate testing, preferential seating for exams, preferential course sign-up, and access to teachers' notes.

The ASRS was given under standard instructions prior to experimental manipulation. Table 3.1 shows the descriptive statistics by group for the ASRS. A main effect was found on the ASRS, with participants in the ADHD group endorsing significantly higher levels of ADHD symptoms than the nonclinical participants (F = 10.86, p = .000). These findings support the diagnostic integrity and credibility of the experimental groups.

Knowledge of ADHD

The AKADDS was given under standard instructions prior to experimental manipulation to assess baseline knowledge of ADHD. Overall, the sample produced a mean AKADDS Total Score of 11.20 (*SD* = 4.77). Thus, the sample accurately responded to an average of 32.94% items, with percent correct responses ranging from 3–62% (median = 32.35%). Their mean "Don't Know" Score of 18.82 (*SD* = 6.85) indicates they did not know the answer to over half of the items (approximately 55.35%). Their mean Incorrect Score of 3.96 (*SD* = 2.81) suggests the sample incorrectly answered approximately 11.65% of items. Table 3.2 shows the scores by group and group comparisons for all AKADDS scales and subscales. The ADHD group knew more about ADHD (t = 3.50, p = .001) and responded *don't know* less (t = -3.93, p = .000) than the NM group. The NM group provided fewer incorrect responses than the ADHD (t = 3.68, p = .001) or CM (t = -2.94, p = .005) groups. No other significant group differences were found for AKADDS Total, Don't Know, or Incorrect Scores.

Overall mean subscale scores were 3.66 (*SD* = 1.63) for Symptoms/Diagnosis, 3.61 (*SD* = 1.98) for Treatment, and 3.93 (*SD* = 2.17) for Associated Features, suggesting the sample knew approximately the same amount about ADHD's symptoms and diagnosis as they did about its treatment and associated features. The sample's average Don't Know Scores for the subscales were 4.66 (*SD* = 2.03) for Symptoms/Diagnosis, 6.39 (*SD* = 2.42) for Treatment, and 7.76 (*SD* = 3.29) for Associated Features. The sample's mean Incorrect Scores for the subscales were 0.68 (*SD* = 0.85) for Symptoms/Diagnosis, 0.99 (*SD* = 1.00) for Treatment, and 2.29 (*SD* = 1.65) for Associated Features. Compared to the NM group, the ADHD group knew more about ADHD's treatment (t = 3.61, p = .001) and associated features (t = 2.82, p = .007), and provided fewer *don't know* responses for all subscales (Symptoms/Diagnosis: t = -2.73, p = .009; Treatment: t = -3.75, p = .001; Associated Features: t = -3.72, p = .001). The NM group provided fewer incorrect responses to items about ADHD's associated features than the ADHD (t = 3.83, p = .000) and CM (t = -3.12, p = .004) groups. No other group differences were found for subscale scores.

However, when the AKADDS group contrasts were converted into Hedges' *g* values (see Table 3.2), a slightly different picture emerged when using Cohen's conventions for effect size interpretation (i.e., effects ≥ 0.20 are small, ≥ 0.50 are medium, and ≥ 0.80 are large; Cohen, 1988). Hedges' *g*, the distance between two sample means in pooled standard deviation units, is an alternative to Cohen's *d* that corrects for sample size with the inverse variance (Hedges & Olkin, 1985). Hedges' *g* was used for the AKADDS comparisons due to the small sample size of the NH group. Medium to large effects sizes ($|g| \geq 0.50$) were found for the ADHD group's overall knowledge and knowledge of treatment and associated features compared to all other groups, which is similar to the findings noted above, but additional small to medium effects ($|g| = 0.28-0.68$) were found for the ADHD group's knowledge of ADHD symptoms and diagnosis compared to the CM and NM groups. Small effects ($|g| = 0.33-0.55$) for the NM group's overall knowledge and knowledge of ADHD's symptoms, diagnosis, and treatment vs. the NH and CM groups. In sum, these results suggest that all participants had at least some baseline knowledge of ADHD and that individuals with ADHD tended to know more about the disorder, particularly its treatment and associated features, than nonclinical participants.

Test Battery Comparisons

The following section presents group differences on measures administered under the experimental manipulation (i.e., honest vs. malingering instruction).

Self-Report Measure Responses. Table 3.3 shows the sample's CAARS scores by group and group comparisons. Significant group differences at $p < 0.01$ were found for each of the CAARS scales except for the Inconsistency, Impulsivity/Emotional Lability, and Problems with Self-Concept scales, and the ADHD Index. Follow-up contrasts showed no significant differences at $p < 0.01$ between the ADHD and CM groups or between the NM and CM groups. The NM group endorsed higher symptom levels than the ADHD group on certain scales. On the Inattention/ Memory Problems and DSM-IV Inattentive Symptoms scales, the NM group scored significantly higher than the ADHD ($t = -3.08$, $p = .004$; $t = -2.66$, $p = .01$; respectively) and NH ($t = -3.27$, $p = .003$; $t = -3.63$, $p = .001$; respectively) groups. Also the CM group scored significantly higher on the DSM-IV Inattentive Symptoms scale than the NH group ($t = -3.12$, $p = .004$). For the Hyperactivity/Restlessness scale, the NH group endorsed significantly less symptoms than all other groups (ADHD: $t = -2.87$, $p = .008$; CM: $t = -3.38$, $p = .002$; and NM: $t = -35.3$, $p = .001$). On the DSM-IV Hyperactive/ Impulsive Symptoms and DSM-IV Total ADHD Symptoms scales, the NH group scored significantly lower than the NM ($t = -3.88$, $p = .001$; $t = -4.21$, $p = .000$; respectively) and CM ($t = -2.84$, $p = .008$; $t = -3.32$, $p = .003$; respectively)

groups. Additionally, the NM group scored higher than the ADHD group (t = -2.69, p = .01) on the DSM-IV Total ADHD Symptoms scale. There were no other group differences at $p < 0.01$.

However, Hedges' *g* effect sizes for the CAARS showed a slightly different picture (see Table 3.3). Large effect sizes ($|g| \geq 0.85$) were found when comparing the NH group vs. the NM and CM groups on all the CAARS scales (average $|g| = 1.27$ and 0.91, respectively), with the exception of the medium effect sizes for NH vs. CM on the Inattention/ Memory Problems ($|g| = 0.58$) and Problems with Self-Concept ($|g| = 0.64$) scales and non-significant effects for NH vs. NM and CM for the Inconsistency scale. Similarly, almost all CAARS scale effect sizes were nearly medium ($|g| \geq 0.45$), medium, or large when comparing the NH vs. ADHD groups (average $|g| = 0.65$), with the exception of the small effect for the Inattention/ Memory Problems scale ($|g| = 0.25$). Effects were medium-to-large when comparing the NM vs. ADHD groups (average $|g| = 0.63$), except for small effects on the Inconsistency, Hyperactivity/Restlessness, Impulsivity/Emotional Lability, and Problems with Self-Concept scales ($|g| > 0.40$). Comparisons of CM vs. ADHD generally showed small effects ($|g| = 0.22–0.49$; average $|g| = 0.40$), though a medium effect was found for the Inconsistency scale ($|g| = 0.75$). All effects for the NM vs. CM comparisons were very small or non-significant ($|g| \leq 0.27$; average $|g| = 0.13$). In sum, these results suggest that, while the CM and NM group were not statistically distinct from each other, the NM group tended to self-report higher levels of ADHD symptoms (especially inattention) than individuals with ADHD group.

Self-report ratings of overall functional impairment on the BFIS were also examined (see Table 3.3 for the BFIS mean group scores). The average BFIS Total Score was 34.49 (*SD* = 23.71) for the overall sample. Follow-up comparisons showed significant group differences for the BFIS Total Score: the NH group had a significantly lower mean score than the NM group ($t = -2.97$, $p = .006$) and trended toward a lower score than the CM group ($t = -2.59$, $p = .015$). The average Mean Impairment Score was 2.63 (*SD* = 1.80) for the overall sample. Group differences for the Mean Impairment Score neared significance: the NM group trended toward a higher mean score than the NH ($t = 2.67$, $p = .012$) and ADHD ($t = -2.45$, $p = .019$) groups. There were no significant differences at $p < 0.01$ in BFIS Total Score or Mean Impairment Score between the NM and CM groups, between ADHD and CM, or between the ADHD and NH groups. Again, Hedges' *g* effect sizes showed a slightly different pattern (see Table 3.3). Large effects were found for comparisons of the NH group vs. the NM and CM groups, small for NH vs. ADHD, and medium for ADHD vs. NM and CM. The effect sizes for NM vs. CM were non-significant. These results indicate the NM group generally rated themselves as having more functional

impairment as compared to nonclinical individuals than did the CM group; however, the ADHD and NH groups did not differ on self-reported functional impairment.

Manipulation Check. A manipulation check was conducted comparing the NH group with a malingering group which combined the CM and NM groups on several variables which were administered under experimental manipulation (see Table 3.4). Using parametric analyses, the malingering group scored significantly lower ($p < .01$) than the NH group on all dedicated effort tests. However, slightly different results were found with non-parametric analyses. Parametric and non-parametric results were consistent for the WMT subtests and the b Test. Using the Kruskal-Wallis test, the malingering group still scored significantly lower than the NH group on the TOMM Retention Trial, though at a higher *p* value ($p < .01$) than with parametric tests. Non-parametric analyses also showed a trend toward significance (malingering < NH) for the LMT and TOMM Trial 2, and no significant differences on the DMT. Thus, malingerers tended to perform worse on the SVTs than nonclinical honest participants. These results, paired with the finding that the nonclinical participants reported lower levels of ADHD symptoms on the CAARS than all other groups, suggest the manipulation was successful.

Neuropsychological Test Performance. Table 3.5 presents mean group scores on the neuropsychological tests. Using parametric analyses, significant group differences were found for the four WMT memory scales, WAIS-IV Processing Speed Index (PSI), CTIP Simple subtest's Coefficient of Variation (all $p < .001$), and CTIP Semantic Choice subtest's Median Reaction Time ($p < .01$). For parametric analyses of the CTIP, Median Reaction Times for the Simple and Choice subtests showed trends toward significant group differences ($p < .05$) and the Coefficients of Variation for the Choice and Semantic Choice subtests showed no significant differences; however, group performance on these measures was significantly different using non-parametric analyses ($p < .01$). No significant differences were found for the WAIS Digit Span Scaled Score.

Table 3.5 also shows group means that differed from each other on individual contrasts for neuropsychological test performance, as well as their corresponding Cohen's *d* effect sizes – *t*-tests were used for all individual comparisons in which parametric and non-parametric omnibus analyses showed similar results, whereas Mann-Whitney *U* tests were used where non-parametric omnibus analyses differed significantly. There were no significant differences at the 0.01 *p*-level between the CM and NM groups for the neuropsychological tests. The NM and CM groups had significantly ($p < .01$) lower scores than the ADHD group on the WMT memory scales and WAIS-IV PSI. The NM group also had significantly ($p < .01$) longer reaction times and larger coefficients of variation than the ADHD group on all CTIP measures except the Choice subtest's Coefficient of Variation which neared significance ($p = .012$). The CM group, on the other hand,

only had a significantly ($p < .01$) longer reaction time and larger coefficient of variation than the ADHD group for the CTIP Choice subtest; however, trends toward significance were found for the Simple and Semantic Choice subtests' Median Reaction Times and the Simple subtest's Coefficient of Variation ($p < .05$). The average significant effect size was large for both NM vs. ADHD ($|d| = 1.15$) and CM vs. ADHD ($|d| = 0.97$). Thus, these results show that the malingering groups, particularly the non-coached group, had longer reaction times, slower processing speeds, more variable response times, and poorer memory performance than individuals with ADHD.

Symptom Validity Test (SVT) Performance. Table 3.6 presents mean group differences for both dedicated and embedded SVTs. Parametric analyses produced significant ($p < .001$) group differences for the two WMT effort measures and the Consistency score. Parametric analyses showed trends toward significant group differences for the three TOMM Trials; however, group differences were significant for Trial 2 and the Retention Trial using non-parametric analyses ($p < .01$). There were no significant group differences for the DMT, LMT, b Test, or WAIS-IV Reliable Digit Span.

Table 3.6 also shows group means that differed from each other on individual contrasts for SVTs, as well as their corresponding Cohen's *d* effect sizes. There were no significant differences between the CM and NM groups on the SVTs. The NM group had significantly lower scores than the ADHD group on all TOMM and WMT effort measures ($p < .01$). The CM group only showed significantly lower scores than the ADHD group on the WMT Delayed Recognition and Consistency measures, though they showed trends toward significantly lower scores on the three TOMM trials and WMT Immediate Recognition trial ($p < .05$). The average significant effect size was large for both NM vs. ADHD ($|d| = 1.03$) and CM vs. ADHD ($|d| = 0.92$). These results suggest that, while coached and non-coached malingerers' SVT performances do not differ from each other, non-coached malingerers tend to perform worse than individuals with ADHD on more SVTs than coached malingerers.

Utility Indicators for the Detection of Malingering

Test operating characteristics, including sensitivity and specificity, for each effort measure were calculated to evaluate their utility in distinguishing between malingering and adequate effort at the given cut score. Sensitivity (SN) is the percentage of individuals with a condition who are identified by a test as having the condition (here, malingerers who fail an effort test), whereas specificity (SP) is the percentage of individuals without a given condition who are identified by a test as not having the condition (here, individuals with ADHD who pass an effort test; i.e., honest responders identified as not malingering). Sensitivity and specificity are not inherent to the test itself, and can be modified by different cut scores. Where available,

established cut scores (e.g., from published manuals) were used to calculate sensitivity and specificity. Since no published cut scores were available for the CTIP or WAIS-IV, the "high specificity" cut scores derived in Jasinski, Harp, et al. (2011) were used (i.e., optimal cut scores when specificity was at least 0.90). Additionally, hit rate (HR) is the percentage of people correctly identified overall (i.e., malingerers identified as malingering and honest responders identified as not malingering). Table 3.7 provides the cut scores used for each measure, as well as the calculated sensitivities, specificities, and hit rates. It should be noted that while the WMT Multiple Choice and Paired Associate subtests, CTIP, and WAIS-IV PSI are neuropsychological measures, the given cut scores have been used to differentiate honest responders from individuals providing poor effort. For the WMT subtests, performances below the cut scores suggest poor effort for individuals without dementia.

At the given cut scores, sensitivity to both coached and non-coached malingering was fair-to-moderate (SN $\geq$ 0.40 and $\leq$ 0.80) for half the WMT measures (Immediate Recognition, Consistency, and WMT Overall), the WAIS-IV PSI, and CTIP SCRT median reaction time. Fair-to-moderate (SN $\geq$ 0.40 and $\leq$ 0.80) sensitivity to non-coached malingering was also found for the WMT Delayed Recognition and Multiple Choice subtests and the CTIP CRT median reaction time. All other sensitivity rates for coached and non-coached malingering were low (SN < 0.40), though some were poor (SN < 0.20; for non-coached DMT and b test, coached WMT Paired Associates subtest, and both coached and non-coached CTIP SCRT Coefficient of Variation and WAIS-IV RDS). Comparisons with Fisher's Exact Test showed no differences in the sensitivity rates for the coached vs. non-coached malingering groups for any of the effort tests.

Specificity, on the other hand, was quite high at these cut scores for participants with ADHD for most SVTs and neuropsychological tests in the main test battery (SP $\geq$ 0.86), including the TOMM, DMT, LMT, WMT, CTIP, and WAIS-IV PSI and RDS. The specificity rate for the b Test was still quite good, but lower than the other measures (SP = 0.81).

Hit rates for coached (CM) and non-coached (NM) malingering were calculated using a 50% base rate. As shown in Table 3.7, the hit rates were good for non-coached malingering for the WMT Immediate Recognition, Consistency, and WMT Overall scores (HR[50] > 0.80), and moderate for non-coached malingering for the WMT Delayed Recognition subtest and for coached malingering for the PSI (HR[50] > 0.70). Fair hit rates (HR[50] > 0.60) were found for coached and non-coached malingering for the TOMM, LMT, WMT Multiple Choice subtest, and CTIP SCRT median reaction time. Additional fair hit rates were found for coached malingering for the DMT, WMT Immediate and Delayed Recognition subtests, WMT Consistency and Overall scores, and CRT Coefficient of Variation, and for non-coached malingering for the

WAIS-IV PSI and CTIP SRT and CRT median reaction times and SRT Coefficient of Variation. The remaining tests performed just under to slightly above chance levels.

More clinically useful statistics, however, are positive predictive power (PPP) and negative predictive power (NPP), because they show tests' ability to predict whether an individual has a specified condition. In other words, PPP and NPP express how well scores above or below a test's identified cut score predict the presence or absence (respectively) of a condition, such as attempts to malinger. These values, shown in Table 3.8, were calculated using the identified cut scores at base rates of 50% and 25% to determine classification accuracy for coached vs. non-coached malingering at varying prevalence estimates for the general population.

As would be expected, PPP was generally higher than NPP at a base rate of 50%. For coached and non-coached malingering, PPPs were good-to-excellent (≥ 0.80) for the TOMM variables and most WMT variables, moderate-to-good (≥ 0.70 and > 0.90) for the DMT, LMT, and WAIS-IV PSI, and moderate-to excellent (> 0.60) for most CTIP variables. PPPs for the b Test and CTIP SCRT Coefficient of Variation were moderate for coached malingering (0.61 and 0.64, respectively), but low for non-coached malingering (0.47 and 0.44, respectively). The widest difference in PPP was for the WAIS-IV RDS, which was 1.00 for non-coached malingering and 0.00 for coached malingering. For coached and non-coached malingering, NPPs were modest to moderate (≥ 0.50 and > 0.80) for all measures except the b Test for non-coached malingering (NPP < 0.50).

As expected, PPP values were generally somewhat lower than NPP values at a base rate of 25%. For coached and non-coached malingering, PPPs were excellent (PPP = 1.00) for the TOMM variables and CTIP SRT median reaction time, and modest-to-moderate (≥ 0.50 and > 0.80) for the DMT, LMT, WAIS-IV PSI, and most WMT variables. PPPs for coached and non-coached malingering were generally low (most > 0.50) for the CTIP variables and the b Test. PPP for the WAIS-IV RDS was again 1.00 for non-coached malingering and 0.00 for coached malingering. At this base rate, all NPPs were moderate-to-high (≥ 0.70 and ≥ 0.90) for coached and non-coached malingering.

In sum, examination of tests' operating characteristics suggest sensitivity to both coached and non-coached malingering ranging from moderate to poor with the best rates shown by the WMT, WAIS-IV PSI, and CTIP, good to excellent specificity for all measures, and better hit rates for non-coached malingering than coached malingering. This suggests that malingerers were no more than moderately likely to fail the SVTs, but honest responders were likely to pass the SVTs. PPPs were generally adequate to excellent and NPPs were generally moderate at a 50% base rate, suggesting individuals classified as feigning were likely to actually be malingering and

those classified as honest were somewhat likely to actually be giving full effort. PPPs were generally modest to moderate and NPPs were generally moderate to high at a 25% base rate, suggesting somewhat lower likelihood that a feigning classification was given to a malingerer but better likelihood that an honest classification was given to individuals providing full effort.

Utility of Effort Tests Used in Combination

No single effort test is 100% accurate, so it is possible for honestly-responding individuals giving their full effort to be identified as malingering. A method for limiting such false positives is to administer multiple SVTs and only classify as malingering individuals who fail more than one SVT. To examine the effectiveness of this method, sensitivity, specificity, and hit rate were calculated for the overall number of dedicated and embedded SVTs failed according to the identified cut scores (see Table 3.9).

Using one SVT failure to classify malingering resulted in good sensitivity to both coached and non-coached malingering (SN = 0.83) but low specificity for ADHD (SP = 0.48). Specificity was improved when two SVT failures were required for malingering classification (SP = 0.86), but sensitivity to both coached and non-coached malingering were only modest (SN = 0.57). When combinations of 3 or more SVT failures were used to classify malingering, specificity for ADHD was excellent (SP $\geq$ 0.95) and sensitivity for coached and non-coached malingering was low (SN $\leq$ 0.35). Comparisons with Fisher's Exact Test showed no differences in the sensitivity rates for the coached vs. non-coached malingering groups for failure on any combination of effort tests (see *p* values in Table 3.9). Maximal hit rate was obtained for classifying coached and non-coached malingering (HR[50] = 0.72 for CM and NM) when at least two SVT failures were required.

Since dedicated effort tests may have better classification properties, sensitivity, specificity, and hit rates were examined again across multiple dedicated SVTs only and are presented in Table 3.10. Using one dedicated SVT failure to classify malingering resulted in moderate sensitivity to coached and non-coached malingering (SN = 0.65 and 0.74, respectively) and moderate specificity for ADHD (SP = 0.62). Specificity was again improved when two SVT failures were required (SP = 0.95) but sensitivity to both coached and non-coached malingering were low (SN = 0.30 and 0.39, respectively). Combinations of 3 or more SVT failures resulted in perfect specificity for ADHD and low sensitivity rates (SN $\leq$ 0.30). Again, comparisons with Fisher's Exact Test showed no differences in the sensitivity rates for the coached vs. non-coached malingering groups (see *p* values in Table 3.10). For combinations of dedicated effort tests only, similar optimal hit rates for classifying coached and non-coached malingering were obtained when one or two SVT failures were required.

To determine which combination of measures most successfully identifies coached or non-coached malingering, and thus the most efficient combination of measures to include in a test battery for ADHD evaluation, binary logistic regressions were performed using effort test performance to predict honest vs. coached malingering and honest vs. non-coached malingering. Only dedicated effort tests with specificity ≥ 90% were entered into the model, including the TOMM, DMT, LMT, and WMT. As summarized in Table 3.11, the WMT Overall score (i.e., failing the Immediate and/or Delayed Recognition trials) was the best predictor for both coached and non-coached malingering vs. ADHD. While the TOMM Overall score (i.e., failure of Trial 2 and/or the Retention Trial) was the next best predictor for both the coached and non-coached malingering models, it did not show significant incremental prediction over the WMT (see change scores in Table 3.11). Additionally, no other tests demonstrated significant incremental prediction over the WMT. These results suggest that use of more than one SVT provides improvement in specificity and hit rate with some cost to sensitivity, and that the WMT provides the best classification for coached or non-coached malingering vs. honest ADHD.

Additional Analyses

Analyses were run to explore the relationship between prior knowledge of ADHD on the AKADDS and malingerers' performance on test battery measures, particularly for the CAARS which was most likely to have a direct relationship as it is a self-report questionnaire, requires symptom reporting, and has been shown by prior research to be the easiest measure on which to feign after symptom coaching. As shown in Table 3.12, there were no significant linear relationships between AKADDS Total Score and any test battery measure for the CM and NM groups. Given this lack of significant relationships, the planned simple linear regressions to examine the ability of prior ADHD knowledge to predict test performance were not performed. Additionally, scatter plots of AKADDS Total Score by each individual test measure did not show any non-linear patterns, so non-linear analyses were also not performed.

Malingering participants (NM and CM) were asked to indicate what strategies they planned to use to feign ADHD during pre-test, and then during post-test to indicate which strategies they actually used to feign ADHD. These data showed participants reported several strategies that may affect test performance. Most planned to overtly exhibit inattention (78% NM, 70% CM) and then reported actually using this strategy (65% NM, 61% CM). Additional reported strategies included careless responding (NM: 17% pre-test, 35% post-test; CM: 26% pre, 30% post), taking a long time (NM: 30% pre, 39% post; CM: 17% pre, 9% post), "forgetting" answers (NM: 9% pre, 13% post; CM: 4% pre, 13% post), and rushing responses (NM: 4% pre and post; CM: 4% pre and post). However, many participants reported some strategies that may

not be directly captured by the tests administered. Most planned to fidget (83% NM, 83% CM), but more participants reported actually using this strategy after testing (100% NM, 96% CM). Additional strategies that may not be directly captured by the tests included acting uncertain (NM: 13% pre, 17% post; CM: 17% pre and post), shifting in the seat (NM: 0% pre, 4% post; CM: 9% pre, 4% post), interrupting (NM: 0% pre and post; CM: 9% pre, 4% post), talking a lot (NM: 9% pre and post; CM: 0% pre, 13% post), and asking for lots of breaks (NM: 9% pre, 0% post; CM: 0% pre, 4% post). It is possible that such overt behaviors may influence clinical decision making, particularly if test performance is also suggestive of ADHD; however, since these behaviors alone may not affect test performance, use of only these strategies may not result in successful feigning.

Additionally, the DSM-5 stipulates that individuals should begin to show ADHD symptoms before age 12 (APA, 2013). Some participants in the ADHD group were diagnosed after age 12 and some were diagnosed at or before this age. While receiving an ADHD diagnosis after age 12 does not preclude symptom onset by age 12, a diagnosis at or prior to age 12 denotes certainty that symptoms began by the DSM-5 cutoff. To explore whether ADHD participants diagnosed at or before age 12 differed from those diagnosed after 12, their test performance was compared. There were no statistically significant differences between these subsamples on any pre-test or main test battery measure using both parametric and non-parametric analyses (see Table 3.13; only parametric analyses reported).

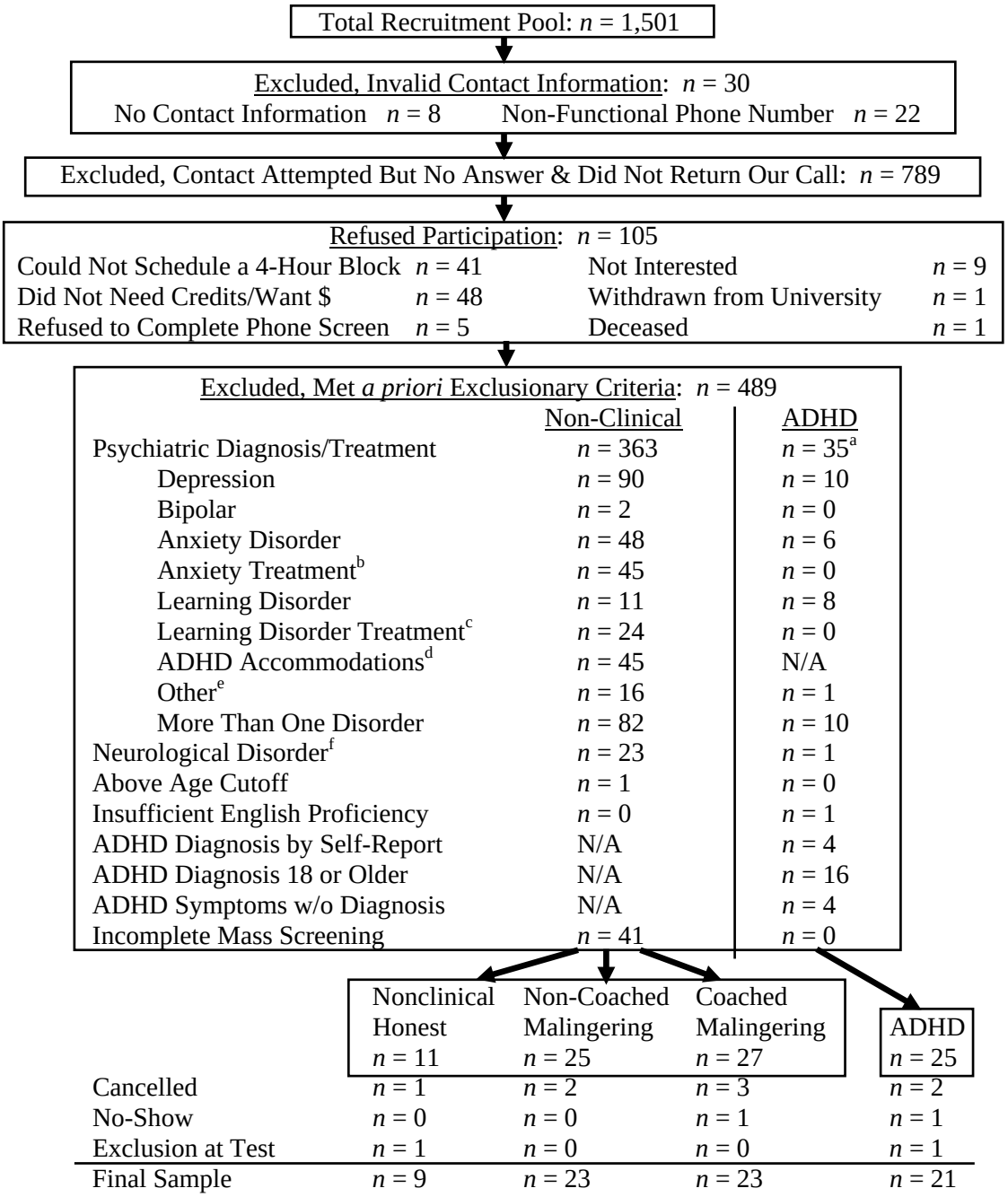

Figure 3.1. Flow diagram of exclusion from initial recruitment pool to final sample.
[a]Psychiatric disorder in addition to ADHD; [b]No specific anxiety disorder reported but noted current treatment for anxiety; [c]No specific learning disorder reported but noted current evaluation, treatment, or accommodations for learning disorders; [d]Indicated receiving academic accommodations for ADHD but denied having ADHD; [e]e.g., substance use disorder, hallucinations, trichotillomania, depersonalization, auditory processing disorder; [f]Moderate-to-severe head injury, large number of concussions, or recent head injury with ongoing sequelae.

Table 3.1. *Demographic Characteristics of Participants Included in Final Sample.*

		Group Characteristics				Comparisons	
		NH	NM	CM	ADHD	*N* = 76	
		n = 9	*n* = 23	*n* = 23	*n* = 21	*F*, χ^2	*p*
Male	%	44.40	47.80	47.80	42.90	0.15 (χ^2)	.985
Age	*M*	19.11	18.78	18.70	18.62	0.57 (*F*)	.637
	SD	1.05	0.90	0.97	1.16		
Education	*M*	12.56	12.43	12.17	12.33	1.01 (*F*)	.392
(years completed)	*SD*	0.73	0.73	0.49	0.66		
Ethnicity						18.13 (χ^2)	.112
Caucasian	%	66.70	87.00	87.00	81.00		
African-American	%	0.00	13.00	4.30	0.00		
Latino(a)	%	22.20	0.00	0.00	4.80		
Asian	%	0.00	0.00	4.20	4.80		
Other	%	11.10	0.00	4.20	9.50		
Repeated Grade	%	0.00	0.00	4.30	0.00	2.34 (χ^2)	.506
WTAR	*M*	111.22	106.09	107.17	102.62	1.50 (*F*)	.222
	SD	7.40	7.26	11.11	14.06		
Pred. FSIQ	*M*	108.11	104.30	105.17	101.81	1.59 (*F*)	.200
	SD	5.09	5.24	7.92	10.07		
ASRS Total Score	*M*	26.11[a]	22.57[a]	21.91[a]	39.76[b]	10.86 (*F*)	.000**
	SD	5.42	10.14	12.12	14.34		
Right-handed	%	100.00	87.00	87.00	85.70	1.39 (χ^2)	.707
Colorblind	%	0.00	0.00	0.00	0.00	N/A	N/A
Hx Head Injury						8.41 (χ^2)	.210
None	%	66.70	82.60	73.90	71.40		
1 Concussion	%	22.20	17.40	26.10	28.60		
2 Concussions	%	11.10	0.00	0.00	0.00		

Note. NH = Nonclinical Honest; NM = Non-coached Malingering; CM = Coached Malingering; ADHD = ADHD Honest; WTAR = Wechsler Test of Adult Reading Standard Score; Pred. FSIQ = Full-scale intelligence quotient predicted from participants' WTAR score; ASRS = Adult ADHD Self-Report Scale; Hx Head Injury = Remote history of head injury.

[abc] Within each row, columns with different letters are significantly ($p < .01$) different from each other with t-test comparisons (used because parametric and non-parametric results were similar).

†$p < .05$, *$p < .01$, **$p < .001$.

Table 3.2. *AKADDS Mean Group Differences*.

	Group Characteristics				Omnibus		Hedges' *g* Contrasts					
	NH *n* = 9	NM *n* = 23	CM *n* = 23	ADHD *n* = 21	*N* = 76		NH vs. ADHD	NH vs. NM	NH vs. CM	NM vs. CM	NM vs. ADHD	CM vs. ADHD
Scales	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*F*	*p*						
Total Score (34)	10.56 (3.75)[ab]	9.00 (4.93)[a]	11.26 (4.64)[ab]	13.81 (4.12)[b]	4.24	.008*	-0.79	0.33	-0.15	-0.46	-1.04	-0.57
Range	5 − 16	1 − 18	2 − 19	3 − 21								
Sxs/Dx (9)	4.00 (1.73)[a]	3.04 (1.69)[a]	3.70 (1.58)[a]	4.14 (1.46)[a]	1.91	.135	-0.09	0.55	0.18	-0.40	-0.68	-0.28
Tx (11)	3.33 (1.32)[ab]	2.65 (1.90)[a]	3.70 (2.03)[ab]	4.67 (1.80)[b]	4.38	.007*	-0.78	0.38	-0.19	-0.52	-1.07	-0.50
Assoc.Feat.(14)	3.22 (1.39)[ab]	3.30 (2.10)[a]	3.87 (2.46)[ab]	5.00 (1.87)[b]	2.87	.042†	-0.99	-0.04	-0.28	-0.24	-0.84	-0.50
Don’t Know Score	20.22 (5.38)[ab]	22.52 (6.87)[a]	17.96 (6.75)[ab]	15.10 (5.50)[b]	5.35	.002*	0.91	-0.34	0.34	0.66	1.16	0.45
Range	13 − 29	8 − 32	7 − 31	6 − 31								
Sxs/Dx	4.44 (2.19)[ab]	5.57 (2.04)[a]	4.43 (2.02)[ab]	4.00 (1.73)[b]	2.54	.063	0.23	-0.53	0.00	0.55	0.81	0.22
Tx	6.89 (1.76)[ab]	7.65 (2.50)[a]	6.17 (2.29)[ab]	5.05 (2.06)[b]	5.15	.003*	0.90	-0.32	0.32	0.61	1.11	0.50
Assoc.Feat.	8.89 (2.62)[ab]	9.30 (3.08)[a]	7.35 (3.50)[ab]	6.05 (2.69)[b]	4.67	.005*	1.03	-0.13	0.46	0.58	1.10	0.41
Incorrect Score	3.11 (2.32)[ab]	2.43 (2.31)[a]	4.78 (3.06)[b]	5.10 (2.49)[b]	5.02	.003*	-0.79	0.29	-0.56	-0.85	-1.09	-0.11
Range	0 − 6	0 − 9	0 − 11	0 − 9								
Sxs/Dx	0.56 (0.73)[a]	0.39 (0.66)[a]	0.87 (0.97)[a]	0.86 (0.91)[a]	1.67	.181	-0.34	0.24	-0.33	-0.57	-0.58	0.01
Tx	0.78 (0.83)[a]	0.65 (1.11)[a]	1.13 (1.06)[a]	1.29 (0.78)[a]	1.83	.149	-0.62	0.12	-0.34	-0.43	-0.65	-0.17
Assoc.Feat.	1.78 (1.56)[ab]	1.39 (1.16)[a]	2.78 (1.81)[b]	2.95 (1.53)[b]	5.11	.003*	-0.74	0.30	-0.56	-0.90	-1.14	-0.10

Note. Values reflect performance under experimental manipulation; maximum possible score noted in parentheses in column 1 (maximum possible score are the same for Total, Don’t Know, or Incorrect Scores); AKADDS = Adult Knowledge of ADD Scale; NH = Nonclinical Honest; NM = Non-coached Malingering; CM = Coached Malingering; ADHD = ADHD Honest; Total Score = Total correct responses; Range = Minimum to maximum score for each overarching measure (i.e., Total, Don’t Know, or Incorrect Score); Sxs/Dx = Symptoms/Diagnosis subscale; Tx = Treatment subscale; Assoc.Feat. = Associated Features subscale; Don’t Know Score = Total “don’t know” responses; Incorrect Score = Total incorrect responses.

[abc] Within each row, columns with different letters are significantly ($p < .01$) different from each other with t-test comparisons (used because parametric and non-parametric results were similar).

†$p < .05$, *$p < .01$, **$p < .001$.

Table 3.3. *CAARS and BFIS Mean Group Differences*.

	Group Characteristics				Omnibus		Hedges' *g* Contrasts					
	NH *n* = 10	NM *n* = 23	CM *n* = 23	ADHD *n* = 21	*N* = 76		NH vs. ADHD	NH vs. NM	NH vs. CM	NM vs. CM	NM vs. ADHD	CM vs. ADHD
Scales	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*F*	*p*						
CAARS												
Inconsist. Raw	5.11 (2.42)[a]	5.35 (2.19)[a]	4.74 (2.20)[a]	6.43 (2.20)[a]	2.23	.092	-0.57	-0.10	0.16	0.27	0.48	0.75
Inatt/Mem. T	52.22 (7.16)[a]	64.48 (10.28)[b]	60.78 (16.33)[ab]	54.71 (10.78)[a]	3.43	.022†	-0.25	-1.26	-0.58	0.27	-0.91	-0.43
Hyp/Rest. T	46.11 (12.53)[a]	62.17 (10.92)[b]	62.48 (12.26)[b]	57.57 (8.81)[b]	5.62	.002*	-1.10	-1.37	-1.29	-0.03	-0.45	-0.45
Imp/Emo. T	46.11 (10.08)[a]	57.39 (10.68)[a]	57.04 (13.07)[a]	52.43 (12.95)[a]	2.45	.071	-0.51	-1.05	-0.87	0.03	-0.41	-0.35
Self-Concept T	47.22 (10.08)[a]	55.91 (9.92)[a]	53.74 (9.89)[a]	51.62 (9.30)[a]	1.92	.134	-0.45	-0.85	-0.64	0.22	-0.44	-0.22
DSM Inatt. T	55.22 (8.81)[a]	73.35 (13.84)[b]	69.78 (17.38)[bc]	62.95 (11.94)[ac]	4.51	.006*	-0.68	-1.41	-0.92	0.22	-0.79	-0.44
DSM Hyp/Imp. T	47.89 (10.90)[a]	66.57 (12.69)[b]	64.74 (16.36)[b]	58.67 (12.80)[ab]	4.69	.005*	-0.86	-1.49	-1.10	0.12	-0.61	-0.40
TotalADHDSxsT	52.67 (10.81)[a]	73.78 (13.41)[b]	70.17 (18.50)[bc]	63.24 (12.54)[ac]	5.29	.002*	-0.86	-1.62	-1.03	0.22	-0.80	-0.45
ADHD Index T	50.78 (10.62)[a]	62.35 (9.83)[a]	62.43 (14.35)[a]	55.95 (11.21)[a]	2.23	.092	-0.46	-1.12	-0.85	-0.01	-0.60	-0.49
BFIS												
Total Score	17.00 (19.31)[a]	41.39 (21.43)[b]	41.78 (25.88)[ab]	26.43 (19.87)[ab]	4.33	.007*	-0.47	-1.14	-1.00	-0.01	0.71	0.65
MIS	1.40 (1.70)[a]	3.15 (1.67)[a]	3.15 (1.94)[a]	2.00 (1.46)[a]	3.99	.011†	-0.38	-1.02	-0.91	0.00	0.72	0.65

Note. Values reflect performance under experimental manipulation; CAARS = Connors' Adult ADHD Rating Scale; BFIS = Barkley Functional Impairment Scale; NH = Nonclinical Honest; NM = Non-coached Malingering; CM = Coached Malingering; ADHD = ADHD Honest; Inconsist. Raw = Inconsistency scale raw score; T = T-score; Inatt/Mem. = Inattention/Memory scale; Hyp/Rest. = Hyperactivity/Restlessness scale; Imp/Emo. = Impulsivity/Emotional Lability scale; Self-Concept = Problems with Self-Concept scale; DSM Inatt. = DSM-IV Inattentive Symptoms scale; DSM Hyp/Imp. = DSM-IV Hyperactive/Impulsive Symptoms scale; Total ADHD Sxs = DSM-IV Total ADHD Symptoms scale; MIS = Mean Impairment Score.

[abc] Within each row, columns with different letters are significantly ($p < .01$) different from each other with t-test comparisons (used because parametric and non-parametric results were similar).

†$p < .05$, *$p < .01$, **$p < .001$.

Table 3.4. *Manipulation Check: NH vs. Malingering Performance on Dedicated Effort Tests*.

	Group Characteristics		Comparisons			
	NH	Malingering	n = 55			
	n = 9	n = 46				
Measures	*M* (*SD*)	*M* (*SD*)	*t*	*p*	*K*	*p*
TOMM						
T2 % Correct	100.00 (0.00)	93.39 (11.14)	4.02	.000**	5.26	.022†
Ret % Correct	100.00 (0.00)	92.70 (11.17)	4.44	.000**	6.92	.009*
DMT % Correct	99.38 (1.23)	93.18 (11.38)	3.59	.001**	3.36	.067
LMT % Correct	99.75 (0.74)	91.62 (13.33)	4.12	.000**	5.91	.015†
b test E-Score	37.46 (10.19)	131.42 (168.66)	-3.74	.000**		
WMT						
Immed. Rec. % Correct	98.89 (1.82)	78.64 (15.06)	8.80	.000**		
Delay. Rec. % Correct	98.89 (2.53)	81.74 (14.30)	7.55	.000**		
Consistency	97.78 (2.64)	75.05 (15.30)	9.39	.000**		

Note. Values reflect performance under experimental manipulation; NH = Nonclinical Honest; Malingering = Group comprised of all participants from the NM and CM groups; *K* = Kruskal-Wallis test (reported only where interpretation differs between parametric and non-parametric analyses); TOMM = Test of Memory Malingering; T2 = Trial 2; Ret = Retention Trial; DMT = Digit Memory Test Total; LMT = Letter Memory Test Total; WMT = Word Memory Test; Immed. Rec. = Immediate Recognition effort subtest; Delay. Rec. = Delayed Recognition effort subtest; Consistency = Consistency between Immediate and Delayed Recall trials.
†$p < .05$, *$p < .01$, **$p < .001$.

Table 3.5. *Mean Group Differences on Neuropsychological Tests.*

	Group Characteristics			Omnibus				Cohen's *d* Contrasts		
	NM	CM	ADHD	*N* = 67				NM	NM	CM
	n = 23	*n* = 23	*n* = 21					vs.	vs.	vs.
Measures	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*F*	*p*	*K*	*p*	CM	ADHD	ADHD
WMT										
Mult. Choice	65.00 (21.32)^{a}	70.22 (20.53)^{a}	90.00 (15.17)^{b}	10.11	.000**			-0.25	-1.35	-1.10
Pair. Assoc.	65.22 (20.48)^{a}	70.22 (22.18)^{a}	87.62 (15.46)^{b}	7.73	.001**			-0.23	-1.23	-0.91
Free Recall	48.04 (15.70)^{a}	44.13 (12.63)^{a}	61.90 (13.46)^{b}	9.64	.000**			0.27	-0.95	-1.36
LD Free Recall	45.65 (14.23)^{A}	43.48 (18.54)^{A}	61.43 (16.37)^{B}	7.65	.001**			0.13	-1.03	-1.03
CTIP										
SRT Med RT	0.51 (0.37)^{A}	0.41 (0.18)^{AB}	0.31 (0.04)^{B}	3.78	.028†	11.18	.004*	0.34	0.76	0.77
SRT CoVar	35.52 (15.42)^{a}	26.69 (12.81)^{ab}	18.52 (9.93)^{b}	9.42	.000**			0.62	1.31	0.71
CRT Med RT	0.86 (0.43)^{A}	0.75 (0.33)^{A}	0.58 (0.30)^{B}	3.25	.045†	13.35	.001**	0.29	0.76	0.54
CRT CoVar	32.68 (15.70)^{AB}	33.22 (14.32)^{A}	25.45 (12.46)^{B}	2.03	.140	8.98	.01*	-0.04	0.51	0.58
SCRT Med RT	1.17 (0.51)^{a}	1.04 (0.37)^{ab}	0.79 (0.25)^{b}	5.24	.008*			0.29	0.95	0.79
SCRT CoVar	33.96 (8.09)^{A}	30.14 (10.13)^{AB}	26.85 (12.31)^{B}	2.65	.078	10.81	.004*	0.42	0.68	0.29
WAIS-IV										
Digit Span SS	8.65 (2.31)^{a}	9.70 (2.77)^{a}	9.43 (2.34)^{a}	1.09	.343			-0.41	-0.33	0.11
PSI	94.09 (10.65)^{a}	93.91 (18.86)^{a}	108.62 (11.74)^{b}	7.54	.001**			0.01	-1.30	-0.94

Note. Values reflect performance under experimental manipulation; NM = Non-coached Malingering; CM = Coached Malingering; ADHD = ADHD Honest; *K* = Kruskal-Wallis test (reported only where interpretation differs between parametric and non-parametric analyses); WMT = Word Memory Test; Mult. Choice = Multiple Choice subtest; Pair. Assoc. = Paired Associates subtest; Free Recall = Free Recall test; LD Free Recall = Long-Delay Free Recall test; CTIP = Computerized Test of Information Processing; SRT = Simple Reaction Time; CRT = Choice Reaction Time; SCRT = Semantic Choice Reaction Time; Med RT = Median Reaction Time; CoVar = Coefficient of Variation; WAIS-IV = Wechsler Adult Intelligence Scale – 4th Edition; Digit Span SS = Digit Span subtest Scaled Score; Sym. Search. SS = Symbol Search subtest Scaled Score; Coding SS = Coding subtest Scaled Score; PSI = Processing Speed Index.
$^{abc/ABC}$ Within each row, columns with different letters are significantly ($p < .01$) different from each other (lower case = t-test comparison - used where parametric and non-parametric results were similar; upper case = Mann-Whitney *U* test comparison - used where non-parametric analyses showed significance levels different from parametric analyses).
†$p < .05$, *$p < .01$, **$p < .001$.

Table 3.6. *Mean Group Differences on Dedicated and Embedded SVTs*.

	Group Characteristics			Omnibus				Cohen's *d* Contrasts		
	NM	CM	ADHD	*N* = 67				NM	NM	CM
	n = 23	*n* = 23	*n* = 21					vs.	vs.	vs.
Measures	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*F*	*p*	*K*	*p*	CM	ADHD	ADHD
TOMM										
T1 % Correct	84.43 (12.18)[a]	86.52 (12.54)[ab]	93.90 (5.67)[b]	4.67	.013†			-0.17	-1.00	-0.76
T2 % Correct	92.43 (11.77)[A]	94.35 (10.65)[AB]	99.90 (0.44)[B]	3.77	.028†	10.35	.006*	-0.17	-0.90	-0.74
Ret % Correct	92.35 (9.90)[A]	93.04 (12.52)[AB]	99.90 (0.44)[B]	4.31	.018†	13.55	.001**	-0.06	-1.08	-0.77
DMT % Correct	93.13 (12.22)[a]	93.23 (10.75)[a]	98.54 (3.89)[a]	2.16	.123			-0.01	-0.57	-0.66
LMT % Correct	91.64 (12.91)[a]	91.59 (14.02)[a]	98.20 (2.95)[a]	2.45	.095			0.00	-0.70	-0.65
b test E-Score	124.04 (188.86)[a]	138.79 (149.68)[a]	105.82 (137.56)[a]	0.23	.794			-0.09	0.11	0.23
WMT										
Immed. Rec. %	74.78 (16.15)[a]	82.50 (13.12)[ab]	93.10 (17.59)[b]	7.53	.001**			-0.52	-1.08	-0.68
Delay. Rec. %	78.80 (14.00)[a]	84.67 (14.29)[a]	96.55 (5.89)[b]	11.99	.000**			-0.41	-1.65	-1.09
Consistency	72.07 (15.64)[a]	78.04 (14.67)[a]	91.79 (17.96)[b]	8.59	.000**			-0.39	-1.17	-0.84
WAIS-IV RDS	9.04 (1.85)[a]	9.61 (2.12)[a]	9.43 (1.96)[a]	0.49	.615			-0.29	-0.20	0.09

Note. Values reflect performance under experimental manipulation; SVT = Symptom Validity Test; NM = Non-coached Malingering; CM = Coached Malingering; ADHD = ADHD Honest; *K* = Kruskal-Wallis test (reported only where interpretation differs between parametric and non-parametric analyses); TOMM = Test of Memory Malingering; T1 = Trial 1; T2 = Trial 2; Ret = Retention Trial; DMT = Digit Memory Test Total; LMT = Letter Memory Test Total; WMT = Word Memory Test; Immed. Rec. = Immediate Recognition effort subtest; Delay. Rec. = Delayed Recognition effort subtest; Consistency = Consistency between Immediate and Delayed Recall trials; % = % Correct; WAIS-IV = Wechsler Adult Intelligence Scale – 4th Edition; RDS = Reliable Digit Span.

[abc/ABC] Within each row, columns with different letters are significantly ($p < .01$) different from each other (lower case = t-test comparison - used where parametric and non-parametric results were similar; upper case = Mann-Whitney *U* test comparison - used where non-parametric analyses showed significance levels different from parametric analyses).

†$p < .05$, *$p < .01$, **$p < .001$.

Table 3.7. *Operating Characteristics for Dedicated and Embedded SVTs.*

	SP for ADHD	SN to NM	SN to CM	*p*	NM HR(50)	CM HR(50)
TOMM						
T2 (< 45)	1.00	0.30	0.22	.738	0.65	0.61
Ret (< 45)	1.00	0.30	0.26	1.000	0.65	0.63
TOMM Overall	1.00	0.35	0.26	.749	0.68	0.63
DMT % Correct (< 90)	0.95	0.17	0.26	.722	0.56	0.61
LMT % Correct (< 93)	0.90	0.30	0.30	1.000	0.60	0.60
b test E-Score (≥ 120)	0.81	0.17	0.30	.491	0.49	0.56
WMT						
Immed. Rec. % (< 82.5)	0.95	0.70	0.43	.136	0.83	0.69
Delay. Rec. % (< 82.5)	0.95	0.57	0.30	.136	0.76	0.63
Consistency (< 82.5)	0.86	0.74	0.52	.221	0.80	0.69
Mult. Choice % (< 70)	0.90	0.48	0.39	.767	0.69	0.65
Pair. Assoc. % (<50)	0.95	0.22	0.17	1.000	0.59	0.56
WMT Overall	0.90	0.74	0.48	.130	0.82	0.69
CTIP						
SRT Med RT (≥ 0.50)[a]	1.00	0.30	0.17	.491	0.65	0.59
SRT CoVar (≥ 35)[a]	0.86	0.39	0.17	.189	0.63	0.52
CRT Med RT (> 0.77)[a]	0.90	0.48	0.22	.121	0.69	0.56
CRT CoVar (> 31.07)[a]	0.86	0.26	0.35	.749	0.56	0.61
SCRT Med RT (≥ 1.05)[a]	0.86	0.43	0.43	1.000	0.65	0.65
SCRT CoVar (≥ 45)[a]	0.95	0.04	0.09	1.000	0.50	0.52
WAIS-IV						
PSI (< 97)[a]	0.86	0.52	0.65	.550	0.69	0.76
RDS (< 7)[a]	1.00	0.09	0.00	.489	0.55	0.50

Note. Values reflect performance under experimental manipulation; SVT = Symptom Validity Test; SP = Specificity; SN = Sensitivity; ADHD = ADHD Honest; NM = Non-coached Malingering; CM = Coached Malingering; *p* = Significance value for Fisher's Exact Test comparing SN; HR = Overall Hit Rate for estimated 50% base rate; TOMM = Test of Memory Malingering; T2 =Trial 2; Ret = Retention Trial; TOMM Overall = raw score <45 on either or both Trial 2 and Retention Trial; DMT = Digit Memory Test Total; LMT = Letter Memory Test Total; WMT = Word Memory Test; % = Percent Correct; Immed. Rec. = Immediate Recognition; Delay. Rec. = Delayed Recognition; Consistency = Consistency between Immediate and Delayed Recall trials; Mult. Choice = Multiple Choice; Pair. Assoc. = Paired Associates; WMT Overall = Failure on either or both Immediate or Delayed Recognition; CTIP = Computerized Test of Information Processing; SRT = Simple Reaction Time; CRT = Choice Reaction Time; SCRT = Semantic Choice Reaction Time; Med RT = Median Reaction Time; CoVar = Coefficient of Variation; WAIS-IV = Wechsler Adult Intelligence Scale – 4th Edition; RDS = Reliable Digit Span; PSI = Processing Speed Index.
[a]High specificity optimal cut score derived from Jasinski, Harp, et al. (2011).

Table 3.8. *Positive and Negative Predictive Power of Dedicated and Embedded SVTs.*

	NM				CM			
	BR = 0.50		BR = 0.25		BR = 0.50		BR = 0.25	
	PPP	NPP	PPP	NPP	PPP	NPP	PPP	NPP
TOMM								
T2 (< 45)	1.00	0.59	1.00	0.81	1.00	0.56	1.00	0.79
Ret (< 45)	1.00	0.59	1.00	0.81	1.00	0.57	1.00	0.80
TOMM Overall	1.00	0.61	1.00	0.82	1.00	0.57	1.00	0.80
DMT % Correct (< 90)	0.77	0.53	0.53	0.77	0.84	0.56	0.63	0.79
LMT % Correct (< 93)	0.75	0.56	0.50	0.79	0.75	0.56	0.50	0.79
b test E-Score (≥ 120)	0.47	0.49	0.23	0.75	0.61	0.54	0.34	0.78
WMT								
Immed. Rec. % (< 82.5)	0.93	0.76	0.82	0.90	0.90	0.63	0.74	0.83
Delay. Rec. % (< 82.5)	0.92	0.69	0.79	0.87	0.86	0.58	0.67	0.80
Consistency (< 82.5)	0.84	0.77	0.64	0.91	0.79	0.64	0.55	0.84
Mult. Choice % (< 70)	0.83	0.63	0.62	0.84	0.80	0.60	0.57	0.82
Pair. Assoc. % (<50)	0.81	0.55	0.63	0.79	0.77	0.53	0.53	0.77
WMT Overall	0.88	0.78	0.71	0.91	0.83	0.63	0.62	0.84
CTIP								
SRT Med RT (≥ 0.50)[a]	1.00	0.59	1.00	0.81	1.00	0.55	1.00	0.78
SRT CoVar (≥ 35)[a]	0.74	0.59	0.48	0.81	0.55	0.51	0.29	0.76
CRT Med RT (> 0.77)[a]	0.83	0.63	0.62	0.84	0.69	0.54	0.42	0.78
CRT CoVar (> 31.07)[a]	0.65	0.54	0.38	0.78	0.71	0.57	0.45	0.80
SCRT Med RT (≥ 1.05)[a]	0.75	0.60	0.51	0.82	0.75	0.60	0.51	0.82
SCRT CoVar (≥ 45)[a]	0.44	0.50	0.21	0.75	0.64	0.51	0.38	0.76
WAIS-IV								
PSI (< 97)[a]	0.79	0.64	0.55	0.84	0.82	0.71	0.61	0.88
RDS (< 7)[a]	1.00	0.52	1.00	0.77	0.00	0.50	0.00	0.75

Note. Values reflect performance under experimental manipulation; SVT = Symptom Validity Test; BR = Base rate of malingering used to calculate PPP and NPP; PPP = Positive Predictive Power; NPP = Negative Predictive Power; NM = Non-coached Malingering; CM = Coached Malingering; TOMM = Test of Memory Malingering; T2 = Trial 2; Ret = Retention Trial; TOMM Overall = raw score <45 on either or both Trial 2 and Retention Trial; DMT = Digit Memory Test Total; LMT = Letter Memory Test Total; WMT = Word Memory Test; % = Percent Correct; Immed. Rec. = Immediate Recognition; Delay. Rec. = Delayed Recognition; Consistency = Consistency between Immediate and Delayed Recall trials; Mult. Choice = Multiple Choice; Pair. Assoc. = Paired Associates; WMT Overall = Failure on one or both of Immediate Recognition or Delayed Recognition; CTIP = Computerized Test of Information Processing; SRT = Simple Reaction Time; CRT = Choice Reaction Time; SCRT = Semantic Choice Reaction Time; Med RT = Median Reaction Time; CoVar = Coefficient of Variation; WAIS-IV = Wechsler Adult Intelligence Scale – 4th Edition; RDS = Reliable Digit Span; PSI = Processing Speed Index.
[a]High specificity optimal cut score derived from Jasinski, Harp, et al. (2011).

Table 3.9. *Utility Indicators for Failure of Multiple Dedicated and Embedded SVTs.*

# Tests Failed	SP for ADHD	SN to NM	SN to CM	*p*	NM HR(50)	CM HR(50)
1	0.48	0.83	0.83	1.000	0.66	0.66
2	0.86	0.57	0.57	1.000	0.72	0.72
3	0.95	0.35	0.30	1.000	0.65	0.63
4	1.00	0.26	0.30	1.000	0.63	0.65
5	1.00	0.26	0.22	1.000	0.63	0.61
6	1.00	0.09	0.13	1.000	0.55	0.57
7	1.00	0.04	0.09	1.000	0.52	0.55

Note. Measures included TOMM Overall, LMT Total % Correct, DMT Total % Correct, b Test E-Score; WMT Overall, WAIS-IV PSI, and WAIS-IV Reliable Digit Span; SVT = Symptom Validity Test; # Tests Failed = total number of feigning measures (dedicated effort tests and embedded indices) on which the participant was identified as malingering using the published cut score or identified high specificity cut score from Jasinski, Harp, et al. (2011); SP = Specificity; SN = Sensitivity; ADHD = ADHD Honest; NM = Non-coached Malingering; CM = Coached Malingering; *p* = Significance value for Fisher's Exact Test comparing SN; HR(50) = Overall Hit Rate for estimated 50% base rate.

Table 3.10. *Utility Indicators for Failure of Multiple Dedicated SVTs.*

# Tests Failed	SP for ADHD	SN to NM	SN to CM	*p*	NM HR(50)	CM HR(50)
1	0.62	0.74	0.65	.749	0.68	0.64
2	0.95	0.39	0.30	.758	0.67	0.63
3	1.00	0.26	0.30	1.000	0.63	0.65
4	1.00	0.26	0.22	1.000	0.63	0.61
5	1.00	0.09	0.13	1.000	0.55	0.57

Note. Measures included TOMM Overall, LMT Total % Correct, DMT Total % Correct, b Test E-Score, and WMT Overall; SVT = Symptom Validity Test; # Tests Failed = total number dedicated effort tests on which the participant was identified as malingering using the published cut score or identified high specificity cut score from Jasinski, Harp, et al. (2011); SP = Specificity; SN = Sensitivity; ADHD = ADHD Honest; NM = Non-coached Malingering; CM = Coached Malingering; *p* = Significance value for Fisher's Exact Test comparing SN; HR(50) = Overall Hit Rate based on estimated 50% base rate.

Table 3.11. *Binomial Logistic Regression Models of Incremental Validity.*

Model for Coached Malingering (*n* = 44)						
Step		***-2LL***	***Δ-2LL***	***R²***	***R² Δ***	***p***
1	**WMT Overall**	52.54		0.231		.004*
2	**TOMM Overall**	49.76	2.78	0.299	0.068	.109

Model for Non-Coached Malingering (*n* = 44)						
Step		***-2LL***	***Δ-2LL***	***R²***	***R² Δ***	***p***
1	**WMT Overall**	40.34		0.498		.000**
2	**TOMM Overall**	37.99	2.35	0.542	0.044	.120

Note. Forward Stepwise Conditional Logistic Regression was used due to the exploratory nature of the data; *-2LL* = -2 log likelihood; *Δ-2LL* = Change in -2 log likelihood; R^2 = Nagelkerke R squared; R^2 *Δ* = R square change; WMT Overall = Word Memory Test, Failure on one or both of Immediate Recognition or Delayed Recognition; TOMM Overall = Test of Memory Malingering, Failure on either or both TOMM Trial 2 and TOMM Retention Trial.
*$p < .01$, **$p < .001$.

Table 3.12. *Pearson Correlations between Prior ADHD Knowledge*[a] *and Test Battery Performance.*

	NM		CM	
Measure	***r***	***p***	***r***	***p***
CAARS				
Inatt/Mem. T- Score	0.12	.593	-0.21	.337
Hyp/Rest. T- Score	0.06	.780	-0.14	.518
Imp/Emo. T- Score	0.08	.727	-0.16	.469
Self-Concept T- Score	-0.18	.425	-0.17	.447
DSM Inatt. T- Score	-0.17	.453	-0.19	.392
DSM Hyp/Imp. T- Score	0.07	.769	-0.09	.697
Total ADHD Sxs T- Score	-0.01	.970	-0.12	.590
ADHD Index T- Score	-0.04	.848	-0.05	.835
BFIS Total	0.10	.645	-0.14	.520
BFIS MIS	0.11	.614	-0.10	.646
CTIP				
SRT Med RT	-0.29	.186	0.25	.257
SRT CoVar	0.01	.958	0.17	.451
CRT Med RT	-0.13	.563	0.10	.649
CRT CoVar	-0.04	.849	-0.34	.114
SCRT Med RT	-0.23	.291	0.07	.767
SCRT CoVar	-0.04	.872	0.32	.139
WAIS-IV				
Digit Span SS	0.00	1.000	0.05	.837
Sym. Search. SS	-0.07	.767	-0.21	.330
Coding SS	0.23	.292	-0.80	.716
PSI	0.13	.555	-0.17	.448
RDS	0.11	.617	0.09	.699
WMT				
Immed. Rec. % Correct	0.12	.572	0.02	.919
Delay. Rec. % Correct	0.15	.504	-0.12	.585
Consistency % Correct	0.04	.873	-0.13	.542
Mult. Choice % Correct	0.08	.731	-0.15	.485
Pair. Assoc. % Correct	0.20	.353	-0.10	.650
Free Recall % Correct	0.27	.217	0.09	.685
LD Free Recall % Correct	0.31	.153	0.01	.959
TOMM				
T1 % Correct	-0.16	.473	-0.12	.572
T2 % Correct	-0.18	.406	-0.17	.445
Ret % Correct	-0.07	.761	-0.11	.628
DMT % Correct	-0.29	.175	-0.05	.815
LMT % Correct	-0.01	.963	0.02	.946
b test E-Score	-0.38	.077	-0.09	.677

Note. NM = Non-coached Malingering; CM = Coached Malingering; CAARS = Connors' Adult ADHD Rating Scale; Inatt/Mem. = Inattention/Memory scale; Hyp/Rest. = Hyperactivity/Restlessness scale; Imp/Emo. = Impulsivity/Emotional Lability scale; Self-Concept = Problems with Self-Concept scale; DSM Inatt. = DSM-IV Inattentive Symptoms scale;

Table 3.12 (continued)

DSM Hyp/Imp. = DSM-IV Hyperactive/Impulsive Symptoms scale; Total ADHD Sxs = DSM-IV Total ADHD Symptoms scale; BFIS = Barkley Functional Impairment Scale; MIS = Mean Impairment Score; CTIP = Computerized Test of Information Processing; SRT = Simple Reaction Time; CRT = Choice Reaction Time; SCRT = Semantic Choice Reaction Time; Med RT = Median Reaction Time; CoVar = Coefficient of Variation; WAIS-IV = Wechsler Adult Intelligence Scale – Fourth Edition; Digit Span SS = Digit Span subtest Scaled Score; Sym. Search. SS = Symbol Search subtest Scaled Score; Coding SS = Coding subtest Scaled Score; PSI = Processing Speed Index; RDS = Reliable Digit Span; WMT = Word Memory Test; Immed. Rec. = Immediate Recognition effort subtest; Delay. Rec. = Delayed Recognition effort subtest; Consistency = Consistency between Immediate and Delayed Recall trials; Mult. Choice = Multiple Choice easy memory subtest; Pair. Assoc. = Paired Associates easy memory subtest; Free Recall = Free Recall hard memory test; LD Free Recall = Long-Delay Free Recall hard memory test; TOMM = Test of Memory Malingering; T1 = Trial 1; T2 = Trial 2; Ret = Retention Trial; DMT = Digit Memory Test Total; LMT = Letter Memory Test Total.

[a]Adult Knowledge of Attention Deficit Disorder Scale Total Score.

†$p < .05$, *$p < .01$, **$p < .001$.

Table 3.13. *Mean Differences between ADHD Subsamples (Diagnosed After Age 12 vs. Age 12 or Before).*

	Subsample Characteristics		Comparisons	
	Dx After Age 12	Dx Age 12 or Before	*N* = 21	
	n = 7	*n* = 14		
Measure	*M* (*SD*)	*M* (*SD*)	*t*	*p*
Pre-Test				
WTAR	100.14 (7.34)	103.86 (16.57)	0.71	.486
Pred. FSIQ	100.00 (5.16)	102.71 (11.87)	0.73	.475
ASRS Total Score	43.00 (11.02)	38.14 (15.87)	-0.72	.478
AKADDS				
Total Score	13.00 (4.16)	14.21 (4.19)	0.63	.538
Don't Know Score	15.29 (4.65)	15.00 (6.05)	-0.11	.914
Incorrect Score	5.71 (2.29)	4.79 (2.61)	-0.80	.434
Main Test Battery				
CAARS				
Inatt/Mem. T	58.57 (10.80)	52.79 (10.62)	-1.17	.256
Hyp/Rest. T	62.29 (8.58)	55.21 (8.22)	-1.83	.083
Imp/Emo. T	57.86 (19.25)	49.71 (7.95)	-1.07	.318
Self-Concept T	52.29 (11.06)	51.29 (8.73)	-0.23	.823
DSM Inatt. T	70.71 (12.24)	59.07 (10.07)	-2.33	.031†
DSM Hyp/Imp. T	61.14 (12.83)	57.43 (13.08)	-0.62	.545
Total ADHD Sxs T	68.86 (11.02)	60.43 (12.66)	-1.50	.151
ADHD Index T	63.14 (12.46)	52.36 (8.95)	-2.29	.034†
BFIS Total	39.14 (22.39)	20.07 (15.68)	-2.28	.034†
BFIS MIS	2.94 (1.59)	1.52 (1.17)	-2.32	.031†
CTIP				
SRT Med RT	0.30 (0.03)	0.31 (0.05)	0.83	.415
SRT CoVar	18.62 (9.91)	18.46 (10.31)	-0.03	.974
CRT Med RT	0.52 (0.03)	0.62 (0.38)	0.70	.493
CRT CoVar	21.42 (4.59)	27.47 (14.70)	1.05	.307
SCRT Med RT	0.76 (0.14)	0.80 (0.30)	0.33	.749
SCRT CoVar	25.61 (5.41)	27.48 (14.78)	0.32	.751
WAIS-IV				
Digit Span SS	9.00 (1.53)	9.64 (2.68)	0.59	.566
Sym. Search. SS	12.14 (1.35)	12.43 (2.56)	0.27	.787
Coding SS	10.71 (2.63)	10.93 (2.46)	0.18	.856
PSI	107.71 (10.67)	109.07 (12.60)	0.24	.810
RDS	9.14 (1.35)	9.57 (2.24)	0.46	.649
TOMM				
T1 % Correct	92.00 (6.73)	94.86 (5.07)	1.09	.288
T2 % Correct	100.00 (0.00)	99.86 (0.53)	-0.70	.494
Ret % Correct	100.00 (0.00)	99.86 (0.53)	-0.70	.494
DMT % Correct	97.62 (6.30)	99.01 (2.07)	0.76	.455
LMT % Correct	98.09 (4.15)	98.25 (2.34)	0.11	.912
b test E-Score	54.94 (22.27)	131.25 (163.68)	1.71	.109

Table 3.13 (continued)

WMT				
Immed. Rec. % Correct	83.93 (28.75)	97.68 (5.14)	1.26	.255
Delay. Rec. % Correct	95.71 (5.90)	96.96 (6.06)	0.45	.658
Consistency % Correct	82.50 (28.69)	96.43 (6.84)	1.27	.250
Mult. Choice % Correct	86.43 (13.76)	91.79 (16.01)	0.76	.460
Pair. Assoc. % Correct	82.86 (15.24)	90.00 (15.57)	1.00	.331
Free Recall % Correct	61.79 (13.52)	61.96 (13.94)	0.03	.978
LD Free Recall % Correct	61.79 (5.72)	61.25 (19.92)	-0.09	.927

Note. Dx = Diagnosed; WTAR = Wechsler Test of Adult Reading Standard Score; Pred. FSIQ = Full-scale intelligence quotient predicted from participants' WTAR score; ASRS = Adult ADHD Self-Report Scale; AKADDS = Adult Knowledge of Attention Deficit Scale; Total Score = AKADDS total correct responses; Don't Know Score = AKADDS total "don't know" responses; Incorrect Score = AKADDS total incorrect responses; CAARS = Connors' Adult ADHD Rating Scale; T = T-score; Inatt/Mem. = Inattention/Memory scale; Hyp/Rest. = Hyperactivity/Restlessness scale; Imp/Emo. = Impulsivity/Emotional Lability scale; Self-Concept = Problems with Self-Concept scale; DSM Inatt. = DSM-IV Inattentive Symptoms scale; DSM Hyp/Imp. = DSM-IV Hyperactive/Impulsive Symptoms scale; Total ADHD Sxs = DSM-IV Total ADHD Symptoms scale; BFIS = Barkley Functional Impairment Scale; MIS = Mean Impairment Score; CTIP = Computerized Test of Information Processing; SRT = Simple Reaction Time; CRT = Choice Reaction Time; SCRT = Semantic Choice Reaction Time; Med RT = Median Reaction Time; CoVar = Coefficient of Variation; WAIS-IV = Wechsler Adult Intelligence Scale – Fourth Edition; Digit Span SS = Digit Span subtest Scaled Score; Sym. Search. SS = Symbol Search subtest Scaled Score; Coding SS = Coding subtest Scaled Score; PSI = Processing Speed Index; RDS = Reliable Digit Span; WMT = Word Memory Test; Immed. Rec. = Immediate Recognition effort subtest; Delay. Rec. = Delayed Recognition effort subtest; Consistency = Consistency between Immediate and Delayed Recall trials; Mult. Choice = Multiple Choice easy memory subtest; Pair. Assoc. = Paired Associates easy memory subtest; Free Recall = Free Recall hard memory test; LD Free Recall = Long-Delay Free Recall hard memory test; TOMM = Test of Memory Malingering; T1 = Trial 1; T2 = Trial 2; Ret = Retention Trial; DMT = Digit Memory Test Total; LMT = Letter Memory Test Total.
†$p < .05$, *$p < .01$, **$p < .001$.

Chapter Four: Discussion

The present study investigated whether the average student given no additional information could feign ADHD as successfully as those who were coached on symptoms, explored college students' baseline knowledge of ADHD, and provided further examination of coached malingering in ADHD evaluation. Each of these aims will be discussed in turn.

Aim 1: Non-Coached vs. Coached Feigned ADHD

The first aim of this study was to determine if coaching (i.e., providing information about ADHD symptoms) is necessary for college students to successfully "fool" diagnostic measures for ADHD. Self-reported ADHD symptoms on the Conners' Adult ADHD Rating Scale (CAARS) were statistically indistinguishable for the coached (CM) and non-coached (NM) malingerers, which aligns with results of previous studies of the effect of coaching on feigned ADHD self-reports (Rios & Morey, 2013; Tucha et al., 2009). However, the ADHD symptom rates for the CM group were more similar to those of the ADHD group than were symptom reports by the non-coached malingerers. Comparison of the CM and ADHD groups produced mostly small effect sizes on the CAARS, whereas the NM group reported higher ADHD symptom levels, particularly for inattention and overall ADHD symptoms, than the ADHD group (effect sizes ranging from small to large). This suggests the CM group was better at feigning ADHD on self-report than the NM group. This finding differs somewhat from previous studies which found virtually no differences in self-reported ADHD symptoms between non-coached malingerers vs. honest ADHD participants (Rios & Morey, 2013; Tucha et al., 2009). However, the present study mirrors one finding by Tucha and colleagues (2009) – that non-coached malingerers may report higher levels of inattention than individuals with ADHD. Further, current comparisons of coached malingerers vs. honest ADHD participants align with previous studies that found few or no significant differences between these two groups (e.g., Harp et al., 2011; Jasinski, Harp, et al., 2011; Quinn, 2003; Sollman et al., 2010; Young & Gross, 2011). As expected, the present study's non-clinical honest group (NH) reported lower levels of ADHD symptoms than the ADHD, NM, and CM groups.

The Barkley Functional Impairment Scale results suggest the NM group rated themselves as having more functional impairment than the CM group, and effect sizes for both malingering groups compared to the ADHD group were large. However, the ADHD group's reported impairment was not statistically different from the NH group at $p < 0.01$ and produced a small effect size. This lower than expected level of impairment could have been due to the fact that the ADHD participants rated their current impairment but were receiving services (e.g., stimulant medication and academic accommodations) that may not eradicate ADHD symptoms but would

likely help decrease impairment. Other possible explanations are that adults with ADHD may not fully appreciate the full range of their ADHD-related impairment or may engage in "niche-picking," that is, tweaking factors in functional domains in order to minimize dysfunction (e.g., having few friends, living alone, gravitating toward work with fewer responsibilities or more stimulation; Barkley, Murphy, & Fischer, 2008). While the individuals with ADHD in this study may have selected dysfunction-minimizing lifestyles, the sample is young (average age of 18.62) and thus are at an age where most people are only just beginning to make their own lifestyle decisions.

Neuropsychological testing results indicate the malingering groups, particularly the non-coached group, had longer reaction times, slower processing speeds, more variable response times, and poorer memory performance on multiple-choice, paired associates, and delayed free recall tasks than individuals with ADHD. Previous research has similarly shown that, compared to groups with ADHD, simulators and "sub-optimal effort" groups exhibit longer reaction times (Booksh et al., 2010; Jasinski, Harp, et al., 2011; Williamson, 2013), slower processing speeds (Harrison et al., 2007; Jasinski, Harp, et al., 2011; Sollman et al., 2010; Suhr et al., 2008; Williamson, 2013), more variable response times (Jasinski, Harp, et al., 2011; Quinn, 2003; Suhr, Sullivan, et al., 2011), and poorer memory performance (Sollman et al., 2010; Suhr et al., 2008; Sullivan et al., 2007). There were, however, no significant differences between the coached and non-coached groups on neuropsychological test performance.

The coached and non-coached malingering groups did not significantly differ on any measures associated with effort testing, including raw score measures and sensitivity rates. Both malingering groups showed large average significant effect sizes compared to individuals with ADHD. However, there was a pattern that non-coached malingerers performed significantly worse than individuals with ADHD on more SVTs than did coached malingerers: both the NM and CM groups differed from the ADHD group on the WMT, but the NM group also differed significantly on the TOMM while the CM group only showed a trend toward significance.

While effect size is a good indicator for the magnitude of between group differences, it is necessary to examine each measure's utility indicators at established cut scores to determine its clinical usefulness. Utility indicators were examined for the SVTs and neuropsychological measures. At the established cut scores, sensitivity to both coached and non-coached malingering was fair to moderate for most WMT measures, the WAIS-IV PSI, and several CTIP measures. Several SVTs obtained malingering sensitivity rates that were much lower than expected: sensitivity rates for the TOMM, DMT, LMT, and b Test were lower than those found in previous studies (Harp, 2010; Sollman et al., 2010; Williamson, 2013), with the exception that the present

DMT sensitivity was similar to that found by Williamson (2013). Specificity for ADHD was good to excellent for all measures at the present cut scores. Using SVTs and neuropsychological measures, hit rates for coached malingering were generally fair and those for non-coached malingering were fair to good with the best performance on the WMT and WAIS-IV PSI.

Positive and Negative Predictive Power (PPP and NPP, respectively) provide additional information about tests' clinical utility by showing the likelihood that a person identified as feigning or honest by the tests will actually belong to those groups. At a base rate of 50%, which maximizes classification accuracy, the TOMM, WMT Immediate and Delayed Recognition subtests, and CTIP Simple subtest median reaction time demonstrated excellent PPP (≥ 0.90) for both coached and non-coached malingering, and most other measures showed PPPs ≥ 0.70 for CM and NM. Thus, it is likely that someone classified as feigning was actually malingering. NPP at this base rate was generally between 0.50 and 0.70, indicating moderate likelihood that individuals classified as honest were actually giving full effort. However, some WMT subtests exceeded NPP of 0.70 for the NM group, showing a better likelihood of accurately classifying honest participants when compared to non-coached malingerers. At a 25% base rate, PPP was still excellent for the TOMM (PPP = 1.00) for CM and NM, but were between 0.50 and 0.80 for all measures except the b Test, WAIS-IV RDS, and most CTIP subtests which fell below 0.50. At this base rate, NPPs were moderate to good (all between 0.75 and 0.91).

The present study showed good sensitivity to both coached and non-coached malingering when participants failed one SVT and only moderate or lower sensitivity thereafter, while good specificity for ADHD was achieved by classification with at least two SVTs and only modest to moderate specificity for one SVT. However, hit rate for coached and non-coached malingering was best when two SVTs were required. Of all the dedicated SVTs, the WMT explained the most variance for classification of malingering vs. honest instruction and no other SVT added any significant incremental prediction. This suggests the WMT provides the best classification for coached or non-coached malingering vs. honest ADHD. Moreover, use of more than one SVT provides improvement in specificity and hit rate with some cost to sensitivity, as has been demonstrated in previous studies (e.g., Harp, 2010; Sollman et al., 2010; Williamson, 2013).

Aim 2: Baseline Knowledge of ADHD

A second aim of this study was to explore undergraduates' baseline knowledge of ADHD. The results showed that 100% of participants had heard of ADHD and had at least some knowledge of it, which was rather higher than studies of the general population where 64–87% had heard of ADHD and a little over 30% had some knowledge (Bussing et al., 2007; McLeod et al., 2007). The present rates were somewhat comparable to the knowledge undergraduate students

in Fisher and Watkins (2008) reported – in their study, 99% had heard of ADHD and 78% had some knowledge of the disorder. Higher rates of familiarity in the present study may be due to the sample's young age and current pursuit of higher education. It should also be noted that most participants were enrolled in Introductory Psychology classes, which may cover basic information about psychiatric disorders such as ADHD.

While all participants had some knowledge of ADHD, the maximum percent accuracy for the current sample was 62%, suggesting that none of the participants displayed a complete understanding of the symptoms, diagnosis, treatment, and associated features of ADHD covered on the Adult Knowledge of ADD Scale (AKADDS). Unsurprisingly, participants with an ADHD diagnosis knew more about the disorder than the non-clinical participants. While the rate of incorrect assumptions made about ADHD on the AKADDS was fairly low, participants with ADHD tended to provide more incorrect responses than non-clinical participants. All participants were instructed to answer *don't know* on any AKADDS item for which they were not certain of the answer. It is possible that participants with ADHD more often responded *true* or *false* even when unsure of the correct answer than other participants. While careless responding is another potential reason for the higher rate of incorrect responses, it is less likely as the ADHD group also provided higher rates of correct responses than the other groups.

It is somewhat puzzling that AKADDS scores did not relate to CAARS performance for the NM group given the fact that the AKADDS assesses the very knowledge that can be used to feign symptoms on the CAARS. It is possible that administration order affected this relationship. For all participants, the AKADDS was the first pre-test measure and the CAARS was the last test measure administered. Thus, the temporal lag between the two measures plus possible participant fatigue may have decreased how much participants relied on knowledge captured by the AKADDS to inform their CAARS performance. Also, the AKADDS was administered under honest instruction, whereas the CAARS was administered under instruction to feign. Perhaps being asked to feign ADHD led participants to draw on some knowledge or planned strategy that wasn't captured by the AKADDS. It is less surprising that a relationship between AKADDS and CAARS scores was not found for the CM group as the experimental manipulation of symptom coaching provided an additional source of information for the participants to draw from when attempting to feign self-reported symptoms.

Limitations

First, it is very difficult to recruit genuine malingers, since they rarely confess, so the current study required the use of a simulation design. It is not known whether these results will in fact generalize to real cases of malingering, but the cost of external validity comes with an

improvement in internal validity, since every participant in the simulation groups was indeed malingering, a pre-test instruction check and post-test queries were administered to ensure malingering participants understood their role throughout testing, and post-test queries explored the effort malingerers put forth to fulfill their role. Additionally, a real-world scenario and monetary incentive were used to provide motivation and increase participants' drive to successfully feign, hopefully simulating a real-world situation. However, even with these attempts to bolster external validity to the extent possible with a simulation design, it is still possible that these results do not fully generalize to real-world malingering of ADHD.

Second, the current study shares a common limitation with the literature, in that members of the ADHD group may not genuinely have the disorder and members of the healthy control and malingering groups may in fact have undiagnosed or subthreshold ADHD. In order to address diagnosis credibility, ADHD participants were included only if their diagnoses were based on methods other than self-report alone and made prior to age 18. Most ADHD participants were diagnosed using cognitive testing or multiple diagnostic tools (71.4%) and more than half were diagnosed at or prior to age 12 (66.7%), which supports the credibility of the ADHD diagnoses. Also, during the screening process, individuals were excluded if they endorsed ADHD symptoms but had not been diagnosed (see Figure 1). Additionally, pre-test ASRS scores showed the ADHD group reported higher baseline ADHD symptoms than the non-clinical groups, suggesting inappropriate group assignment is unlikely.

Third, for the ADHD group, a 12-hour medication abstention may not be long enough to return performance to baseline. However, most stimulant medications used to treat ADHD have a short enough half-life that the medications' effects will have at least mostly dissipated by the test session (Advokat, 2010). Furthermore, participants could hypothetically lie and take stimulant medications regardless. However, they would have had to lie about abstaining or planning to abstain from stimulant medications on several occasions (i.e., when consenting to the abstention at the phone screening, when reminded to abstain 24 hours prior to the evaluation, and on the day of the evaluation); such repeated agreements to abstain from stimulants might provide incentive to follow-through with this requirement. Also, since the current study did not control for non-stimulant medications, including non-stimulant pharmacologic treatments for ADHD, it is possible that these medications affected performance.

Fourth, potential limitations exist with the administration of the CAARS and BFIS. Administration order of the CAARS was purposefully not randomized. That is, it was administered after all other main test battery measures for all participants. This was done to limit any indirect coaching that a clearly marked ADHD self-report measure could provide. However,

this meant the CAARS was always administered at the end of a 3.5–4 hour battery. Thus, CAARS performance could have been systematically affected by participant fatigue. Additionally, most participants with ADHD were currently receiving pharmacologic treatment and/or academic accommodations. Since the CAARS and BFIS ask respondents to rate their recent impairment, ADHD participants whose interventions were successfully improving their functioning could have produced lower scores than they would have without current treatment.

Fifth, every effort was made to reduce any indirect coaching (e.g., disguising the true nature of the ASRS in the pre-test session, administering the CAARS after all other test measures) to ensure that non-coached malingering performance was based on participants' baseline knowledge of ADHD. One could argue, however, that participants could have received indirect coaching from the AKADDS since some of its items include information on ADHD. Any indirect coaching from this measure would have been avoided by asking participants to provide free-form descriptions of ADHD, but this method would have resulted in data that was more difficult to compare between participants. The AKADDS was selected because of its ease of use and comparability between participants, but also because it includes reverse-scored foil items – that is, items with inaccurate information about ADHD where the correct response is *false*. Thus, participants would have had to know that an AKADDS item provided an accurate description of ADHD for it to have helped their efforts to malinger ADHD.

Finally, the present study only used one form of coaching: symptom coaching. This strategy was chosen because previous research on malingered ADHD has found it to be a useful coaching strategy and because information about symptoms is the most readily available. The availability of symptom information on the internet and elsewhere thus gives this particular coaching strategy the most real-world generalizability (i.e., over providing information on test-taking strategies or warning about the use of SVTs). However, research on malingered head injury suggests individuals who are coached using multiple strategies may be more successful at malingering. It is possible, then, that the current set of coached simulators was less successful than they would have been had they been provided multiple coaching strategies. Since the present study is one of few that has examined both coached and non-coached individuals within the context of ADHD evaluations, priority was given to a coaching design with the most real-world generalizability.

Implications

This study provides further evidence supporting the need for more comprehensive ADHD evaluations. Self-report alone should not be used to diagnose individuals with ADHD, particularly since this and other studies (Rios & Morey, 2013; Tucha et al., 2009) have found that

individuals can successfully feign ADHD on self-report measures based only on their prior knowledge of the disorder and all of the college students in the present study demonstrated at least some prior knowledge of ADHD. Both neuropsychological measures and symptom validity tests were able to differentiate between individuals with ADHD and those asked to malinger, either with or without coaching. The Word Memory Test in particular may be a useful measure for ADHD evaluation given its favorable performance for classifying malingered ADHD in this study.

References

Advokat, C. (2010). What are the cognitive effects of stimulant medications? Emphasis on adults with attention-deficit/hyperactivity disorder (ADHD). *Neuroscience and Biobehavioral Reviews, 34*(8), 1256–1266. doi: 10.1016/j.neubiorev.2010.03.006

Advokat, C. D., Guidry, D., & Martino, L. (2011). Licit and illicit use of medications for attention-deficit hyperactivity disorder in undergraduate college students. *Journal of American College Health, 56*(4), 601–606. doi: 10.3200/JACH.56.6.601-606

American Psychiatric Association. (2000). *Diagnostic and Statistical Manual of Mental Disorders, Text Revision.* (4th ed., revised). Washington, DC, USA: Author.

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Washington, DC, USA: Author.

Babcock, Q., & Byrne, T. (2000). Student perceptions of methylphenidate abuse at a public liberal arts college. *Journal of American College Health, 49*(3), 143–145. doi: 10.1080/07448480009596296

Barkley, R. A. (2011). *Barkley Functional Impairment Scale (BFIS).* New York, NY, USA: Guilford Press.

Barkley, R. A., Cook, E. H., Dulcan, M., Campbell, S., Prior, M., Atkins, M., … Lewandowski, L. (2002). Consensus statement on ADHD. *European Child & Adolescent Psychiatry, 11*(2), 96–98. doi: 10.1007/s007870200017

Barkley, R. A., Fischer, M., Smallish, L., & Fletcher, K. (2006). Young adults outcome of hyperactive children: Adaptive functioning in major life activities. *Journal of the American Academy of Child & Adolescent Psychiatry, 45*(2), 192–202. doi: 10.1097/01.chi.0000189134.97436.e2

Barkley, R. A., Murphy, K. R., & Fischer, M. (2008). *ADHD in Adults: What the Science Says.* New York, NY, USA: Guilford Press.

Bauer, L., & McCaffrey, R. J. (2006). Coverage of the Test of Memory Malingering, Victoria Symptom Validity Test, and Word Memory Test on the internet: Is test security threatened? *Archives of Clinical Neuropsychology, 21*(1), 121–126. doi: 10.1016/j.acn.2005.06.010

Booksh, R. L., Pella, R. D., Singh, A. N., & Gouvier, W. D. (2010). Ability of college students to simulate ADHD on objective measures of attention. *Journal of Attention Disorders, 13*(4), 325–338. doi: 10.1177/1087054708329927

Boone, K., Lu, P., & Herzberg, D. S. (2002). *The b Test Manual.* Los Angeles, CA, USA: Western Psychological Services.

Boone, K. B., Lu, P., Sherman, D., Palmer, B., Back, C., Shamieh, E., …, Berman, N. G. (2000). Validation of a new technique to detect malingering of cognitive symptoms: The b Test. *Archives of Clinical Neuropsychology, 15*(3), 227–241. doi: 10.1016/S0887-6177(99)00014-1

Bracken, B., & Boatwright, B. (2005). *CAT-C, Clinical Assessment of Attention Deficit-Child and CAT-A Clinical Assessment of Attention Deficit-Adult Professional Manual.* Lutz, FL, USA: Psychological Assessment Resources.

Bussing, R., Gary, F. A., Mills, T. L., & Garvan, C. W. (2007). Cultural variations in parental health beliefs, knowledge, and information sources related to attention-deficit/hyperactivity disorder. *Journal of Family Issues, 28*(3), 291–318. doi: 10.1177/0192513X06296117

Bussing, R., Zima, B. T., Mason, D. M., Meyer, J. M., White, K., & Garvan, C. W. (2012). ADHD knowledge, perceptions, and information sources: Perspectives from a community sample of adolescents and their parents. *Journal of Adolescent Health, 51*(6), 593–600. doi: 10.1016/j.jadohealth.2012.03.004

Ciccarone, D. (2011). Stimulant abuse: Pharmacology, cocaine, methamphetamine, treatment, attempts at pharmacotherapy. *Primary Care: Clinics in Office Practice, 38*(1), 41–58. doi: 10.1016/j.pop.2010.11.004

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences (2nd ed.).* Hillsdale, NJ, USA: Lawrence Erlbaum Associates.

Conners, C. K., Erhardt, D., & Sparrow, E. (1999). *Conners' Adult ADHD Rating Scales: (CAARS)*. Toronto, Canada: Multi-Health Systems, Inc.

Conti, R. P. (2004). Malingered ADHD in adolescents diagnosed with Conduct Disorder: A brief note. *Psychological Reports, 94*(3), 987–988. doi: 10.2466/PR0.94.3.987-988

Dahmane, J., & Reilley, S. P. (2010). The reliability and validity of the Adult Knowledge of Attention Deficit Disorders Scales. *Journal of the Kentucky Academy of Science, 70*(2), 172.

Davidson, M. A. (2008). ADHD in adults: A review of the literature. *Journal of Attention Disorders, 11*(6), 628–641. doi: 10.1177/1087054707310878

Faraone, S V., Wilens, T. E., Petty, C., Antshel, K., Spencer, T., & Biederman, J. (2007). Substance use among ADHD adults: Implications of late onset and subthreshold diagnoses [Supplemental material]. *The American Journal on Addictions, 16*, 24–34. doi: 10.1080/10550490601082767

Fisher, A. B. & Watkins, M. W. (2008). ADHD rating scales' susceptibility to faking in a college student sample. *Journal of Postsecondary Education and Disability, 20*(2), 81–92.

Frazier, T. W., Frazier, A. R., Busch, R. M., Kerwood, M. A., & Demaree, H. A. (2008). Detection of simulated ADHD and reading disorder using symptom validity measures. *Archives of Clinical Neuropsychology, 23*(5), 501–509. doi: 10.1016/j.acn.2008.04.001

Gordon, D. H. (2003). Validation of the MMPI-2 ADHD scale in a clinical, psychoeducational sample. *Dissertation Abstracts International: Section B: The Sciences and Engineering, 63*(11–B), 5515.

Green, P. (2003). *Manual for the Word Memory Test for Windows*. Edmonton, Alberta, Canada: Green's Publishing.

Harp, J. P. (2010). *Detection of malingered ADHD among college students* (Master's thesis). Hardcopy available at W. T. Young Library, University of Kentucky, Lexington, KY.

Harp, J. P., Jasinski, L. J., Shandera-Ochsner, A. L., Mason, L. H., & Berry, D. T. R. (2011). Detection of malingered ADHD using the MMPI-2-RF. *Psychological Injury and Law, 4*(1), 32–43. doi: 10.1007/s12207-011-9100-9

Harrison, A. G. (2006). Adults faking ADHD: You must be kidding! *The ADHD Report, 14*(4), 1–5.

Harrison, A. G., Edwards, M. J., & Parker, K. C. H. (2007). Identifying students faking ADHD: Preliminary findings and strategies for detection. *Archives of Clinical Neuropsychology, 22*(5), 577–588. doi: 10.1016/j.acn.2007.03.008

Hedges, L., & Olkin, I. (1985). *Statistical Methods for Meta-analysis.* New York, NY, USA: Academic Press.

Hiscock, M., & Hiscock, C. K. (1989). Refining the forced-choice method for the detection of malingering. *Journal of Clinical and Experimental Neuropsychology, 11*(6), 967–974. doi: 10.1080/01688638908400949

Inman, T. H., Vickery, C. D., Berry, D. T., Lamb, D. G., Edwards, C. L., & Smith, G. T. (1998). Development and initial validation of a new procedure for evaluating adequacy of effort given during neuropsychological testing: The Letter Memory Test. *Psychological Assessment, 10*(2), 128–139. doi: 10.1037/1040-3590.10.2.128

Jachimowicz, G., & Geiselman, R. E. (2004). Comparison of ease of falsification of attention deficit hyperactivity disorder diagnosis using standard behavioral rating scales. *Cognitive Science Online, 2*(1), 6–20. Retrieved from http://cogsci-online.ucsd.edu/2/2-1.pdf

Jasinski, L. J., Berry, D. T. R., Shandera, A. L., & Clark, J. A. (2011). Use of the Wechsler Adult Intelligence Scale Digit Span subtest for malingering detection: A meta-analytic review. *Journal of Clinical and Experimental Neuropsychology, 33*(3), 300–314. doi: 10.1080/13803395.2010.516743

Jasinski, L. J., Harp, J. P., Berry, D. T., Shandera-Ochsner, A. L., Mason, L. H., & Ranseen, J. D. (2011). Using symptom validity tests to detect malingered ADHD in college students. *The Clinical Neuropsychologist, 25*(8), 1415–1428. doi: 10.1080/13854046.2011.630024

Jasinski, L. J., & Ranseen, J. D. (December, 2011). Malingered ADHD Evaluations: A Further Complication for Accommodations Reviews. *The Bar Examiner*. Retrieved from http://www.ncbex.org/assets/media_files/Bar-Examiner/articles/2011/800411 JasinskiRanseen.pdf

Kane, S. T. (2008). Minimizing malingering and poor effort in the LD/ADHD evaluation process. *The ADHD Report, 16* (5), 5–9. doi: 10.1521/adhd.2008.16.5.5

Kessler, R. C., Adler, L., Ames, M., Demler, O., Faraone, S., Hiripi, E., … Walters, E. E. (2005). The World Health Organization Adult ADHD Self-Report Rating Scale (ASRS): A short screening scale for use in the general population. *Psychological Medicine, 35*(2), 245–256. doi: 10.1017/S0033291704002892

Klein-Schwartz, W. (2002). Abuse and toxicity of methylphenidate. *Current Opinion in Pediatrics, 14*(2), 219–223.

Lezak, M. (2004). *Neuropsychological Assessment* (4th ed.). New York, NY, USA: Oxford University Press.

Liang, B. A., & Mackey, T. K. (2011). Prevalence and global health implications of social media in direct-to-consumer drug advertising. *Journal of Medical Internet Research, 13*(3), 207–216. doi: 10.2196/jmir.1775

Manor, I. I., Vurembrandt, N. N., Rozen, S. S., Gevah, D. D., Weizman, A. A., & Zalsman, G. G. (2012). Low self-awareness of ADHD in adults using a self-report screening questionnaire. *European Psychiatry, 27*(5), 314–320. doi: 10.1016/j.eurpsy.2010.08.013

Marshall, P., Schroeder, R., O'Brien, J., Fischer, R., Ries, A., Blesi, B., & Barker, J. (2010). Effectiveness of symptom validity measures in identifying cognitive and behavioral symptom exaggeration in adult attention deficit hyperactivity disorder. *The Clinical Neuropsychologist, 24*(7), 1204–1237. doi: 10.1080/13854046.2010.514290

McCabe, S. E., Knight, J. R., Teter, C. J., & Wechsler, H. (2005). Non-medical use of prescription stimulants among US college students: Prevalence and correlates from a national survey. *Addiction, 100*(1), 96–106. doi: 10.1111/j.1360-0443.2004.00944.x

McCabe, S. E., Teter, C. J., & Boyd, C. J. (2006). Medical use, illicit use, and diversion of abusable prescription drugs. *Journal of American College Health, 54(5),* 269–278. doi: 10.1080/02791072.2006.10399827

McLeod, J. D., Fettes, D. L., Jensen, P. S., Pescosolido, B. A., & Martin, J. K. (2007). Public knowledge, beliefs, and treatment preferences concerning attention-deficit hyperactivity disorder. *Psychiatric Services* [Special Section on the National Stigma Study-Children], *58*(5), 626–631. doi: 10.1176/appi.ps.58.5.626

Musso, M. W., & Gouvier, W. (2012). "Why is this so hard?": A review of detection of malingered ADHD in college students. *Journal of Attention Disorders, 17*(6), 1–16. doi: 10.1177/1087054712441970

Norwalk, K., Norvilitis, J. M., & MacLean, M. G. (2009). ADHD symptomatology and its relationship to factors associated with college adjustment. *Journal of Attention Disorders, 13*(3), 251–258. doi: 10.1177/1087054708320441

Parran, T. V., & Jasinski, D. R. (1991). Intravenous methylphenidate abuse. Prototype for prescription drug abuse. *Archives of Internal Medicine, 151*(4). 781–783. doi: 10.1001/archinte.1991.00400040119027

Pella, R. D., Hill, B. D., Shelton, J. T., Elliot, E., & Gouvier, W. D. (2012). Evaluation of embedded malingering indices in a non-litigating clinical sample using control, clinical, and derived groups. *Archives of Clinical Neuropsychology, 27*(1), 45–57. doi: 10.1093/arclin/acr090

Pescosolido, B. A., Jensen, P. S., Martin, J. K., Perry, B. L., Olafsdottir, S., & Fettes, D. (2008). Public knowledge and assessment of child mental health problems: Findings from the National Stigma Study – Children. *Journal of the American Academy of Child and Adolescent Psychiatry, 47*(3), 339–349. doi: 10.1097/0b013e318160e3a0CHI.

Pliszka, S., & the American Academy of Child and Adolescent Psychiatry (AACAP) Work Group on Quality Issues. (1997). Practice parameters for the assessment and treatment of children and adolescents with attention-deficit/hyperactivity disorder. *Journal of the American Academy of Child and Adolescent Psychiatry, 46*(7), 894–921. doi: 10.1097/chi.0b013e318054e724

Quinn, C. A. (2003). Detection of malingering in assessment of adult ADHD. *Archives of Clinical Neuropsychology, 18*(4), 379–395. doi: 10.1016/S0887-6177(02)00150-6

Quintero, G. (2009). Controlled release: A cultural analysis of collegiate polydrug use. *Journal of Psychoactive Drugs, 41*(1), 39–47. doi: 10.1080/02791072.2009.10400673

Rees, L. M., Tombaugh, T. N., & Boulay, L. (2001). Depression and the Test of Memory Malingering. *Archives of Clinical Neuropsychology, 16*(5), 501–506. doi: 10.1016/S0887-6177(00)00064-0

Rios, J., & Morey, L. C. (2013). Detecting feigned ADHD in later adolescence: An examination of three PAI-A negative distortion indicators. *Journal of Personality Assessment, 95*(6), 594–599. doi: 10.1080/00223891.2013.821071

Rogers, R. (2008). *Clinical Assessment of Malingering and Deception* (3rd ed.). New York, NY, USA: Guilford Press.

Ruiz, M. A., Drake, E. B., Glass, A., Marcotte, D., & van Gorp, W. G. (2002). Trying to beat the system: Misuse of the internet to assist in avoiding the detection of psychological symptom dissimulation. *Professional Psychology: Research and Practice, 33*(3), 294–299. doi: 10.1037/0735-7028.33.3.294

Schipper, L. J., Berry, D. T. R., Coen, E., & Clark, J. A. (2008). Cross-validation of a manual form of the Letter Memory Test using a known-groups methodology. *The Clinical Neuropsychologist, 22*(2), 345–349. doi: 10.1080/13854040701218428

Simon, V., Czobor, P., Bálint, S., Mészáros, A., & Bitter, I. (2009). Prevalence and correlates of adult attention-deficit hyperactivity disorder: A meta-analysis. *The British Journal of Psychiatry, 194*(3), 204–211. doi: 10.1192/bjp.bp.107.048827

Sollman, M. J., & Berry, D. T. R. (2011). Detection of inadequate effort on neuropsychological testing: A meta-analytic update and extension. *Archives of Clinical Neuropsychology, 26*(8), 774–789. doi: 10.1093/arclin/acr066

Sollman, M. J., Ranseen, J. D., & Berry, D. T. R. (2010). Detection of feigned ADHD in college students. *Psychological Assessment, 22* (2), 325–335. doi: 10.1037/a0018857

Suhr, J. A., Buelow, M., & Riddle, T. (2011). Development of an infrequency index for the CAARS. *Journal of Psychoeducational Assessment, 29*(2), 160–170. doi: 10.1177/0734282910380190

Suhr, J., Hammers, D., Dobbins-Buckland, K., Zimak, E., & Hughes, C. (2008). The relationship of malingering test failure to self-reported symptoms and neuropsychological findings in adults referred for ADHD evaluation. *Archives of Clinical Neuropsychology, 23*(5), 521–530. doi: 10.1016/j.acn.2008.05.003

Suhr, J. A., & Gunstad, J. (2007). Coaching and malingering: A review. In G. J. Larrabee (Ed.), *Assessment of malingered neuropsychological deficits* (pp. 287–311). New York, NY, USA: Oxford University Press.

Suhr, J. A., Sullivan, B. K., & Rodriguez, J. L. (2011). The relationship of noncredible performance to continuous performance test scores in adults referred for attention-deficit/hyperactivity disorder evaluation. *Archives of Clinical Neuropsychology, 26*(1), 1–7. doi: 10.1093/arclin/acq094

Sullivan, B. K., May, K., & Galbally, L. (2007). Symptom exaggeration by college adults in attention-deficit hyperactivity disorder and learning disorder assessments. *Applied Neuropsychology, 14*(3), 189–207. doi: 10.1080/09084280701509083

Tan, J.E., Slick, D. J., Strauss, E., & Hultsch, D. F. (2002). How'd they do it? Malingering strategies on symptom validity tests. *The Clinical Neuropsychologist, 16*(4), 495–505. doi: 10.1076/clin.16.4.495.13909

Timko, C. A., & Chowansky, A. (2008). Direct-to-consumer advertising of psychotropic medication and prescription authority for psychologists. *Professional Psychology: Research and Practice, 39*(5), 512–518. doi: 10.1037/0735-7028.39.5.512

Timko, C. A., & Herbert, J. D. (2007). Physician self-reported experiences with direct-to-consumer advertising of psychotropic medication. *Scientific Review of Mental Health Practice, 5*(2), 3–7.

Tombaugh, T. N. (1996). *Test of Memory Malingering: TOMM*. North Tonawanda, NY, USA: Multi-Health Systems, Inc.

Tombaugh, T. N., & Rees, L. (2000). *Manual for the Computerized Tests of Information Processing (CTIP)*. Ottawa, Ontario, Canada: Carleton University.

Tucha, L., Sontag, T. A., Walitza, S., & Lange, K. W. (2009). Detection of malingered attention deficit hyperactivity disorder. *ADHD Attention Deficit and Hyperactivity Disorders, 1*(1), 47–53. doi: 10.1007/s12402-009-0007-1

Vagnini, V. L., Sollman, M. J., Berry, D. T. R., Granacher, R. P., Clark, J. A., Burton, R., … Saier, J. (2006). Known-groups cross-validation of the Letter Memory Test in a compensation-seeking mixed neurologic sample. *The Clinical Neuropsychologist, 20*(2), 289–304. doi: 10.1080/13854040590947470

Vickery, C. D., Berry, D. T. R., Inman, T. H., Harris, M. J., & Orey, S. A. (2001). Detection of inadequate effort on neuropsychological testing: A meta-analytic review of selected procedures. *Archives of Clinical Neuropsychology, 16*(1), 45–73. doi: 10.1016/S0887-6177(99)00058-X

Watkins, C. M., & Reilley, S. P. (2009, April). *Initial assessment of the Adult Knowledge of Attention Deficit Disorders Scales.* Paper session presented at the annual meeting of the Carolinas Psychology Conference, Raleigh, NC, USA.

Wechsler, D. (2001). *Wechsler Test of Adult Reading: WTAR.* New York, NY, USA: The Psychological Corporation.

Wechsler, D. (2008). *WAIS-IV Administration and Scoring Manual*. San Antonio, TX, USA: Pearson Assessments.

Wender, E. H. (1995). Attention-deficit hyperactivity disorders in adolescence. *Developmental and Behavioral Pediatrics, 16*(3), 192–195. doi: 10.1097/00004703-199506000-00008

Weyandt, L. & DuPaul, G. (2006). ADHD in college students. *Journal of Attention Disorders, 10*(1), 9–19. doi: 10.1177/1087054705286061

Wilens, T. E., Faraone, S. V., & Biederman, J. (2004). Attention-deficit/hyperactivity disorder in adults. *Journal of the American Medical Association, 292*(5), 619–623. doi: 10.1001/jama.292.5.619

Williamson, K. D. (2013). *Discriminating between ADHD, ADHD with a comorbid psychological disorder, and malingered ADHD in a college sample* (Master's thesis). Hardcopy available at W. T. Young Library, University of Kentucky, Lexington, KY.

Willison, J. & Tombaugh, T. N. (2006). Detecting simulation of attention deficits using reaction time tests. *Archives of Clinical Neuropsychology, 21*(1), 41–52. doi: 10.1016/j.acn.2005.07.005

Young, J. C., & Gross, A. M. (2011). Detection of response bias and noncredible performance in adult attention-deficit/hyperactivity disorder. *Archives of Clinical Neuropsychology, 26*(3), 165–175. doi: 10.1093/arclin/acr013

Zasler, N. D., & Martelli, M. F. (2003). Mild traumatic brain injury: Impairment and disability assessment caveats. *Neuropsychological Rehabilitation, 13*(1/2), 31–41. doi: 10.1080/09602010

Maryanne Edmundson, M.S.
Curriculum Vita

EDUCATIONAL INSTITUTIONS

Master of Science in Clinical Psychology
University of Kentucky (UK); Lexington Kentucky
Date of Completion: May 2010

Bachelor of Arts in Psychology, Women's and Gender Studies, Magna Cum Laude
University of North Carolina at Greensboro; Greensboro, North Carolina
Date of Completion: May 2005

PROFESSIONAL POSITIONS

2014-present	***Psychology Intern,*** Minneapolis VA Healthcare System
2013-2014	***General Rehabilitation Unit Psychology Trainee,*** Cardinal Hill Rehabilitation Hospital
2007-2014	***Graduate Student Researcher,*** UK Psychology Department
2012-2013	***Graduate Psychology Trainee,*** Eastern State Hospital
2012-2013	***Teacher's Assistant,*** UK Psychology Department
2008-2013	***Individual, Group, and Assessment Therapist,*** Jesse G. Harris Psychological Services Center
2012	***Course Instructor,*** UK, Online Undergraduate Developmental Psychology
2012	***Co-Author,*** UK Internship Consortium Program Initial American Psychological Association Accreditation Application
2011	***Research Assistant,*** Lexington Veterans Affairs Medical Center, Lexington, KY
2010-2011	***Research Assistant,*** UK Department of Physical Medicine and Rehabilitation
2010-2011	***Assessment Trainee,*** UK Psychiatry Department
2010-2011	***Neuropsychology Trainee,*** UK Department of Physical Medicine and Rehabilitation
2009-2010	***Research Assistant,*** UK Psychiatry Department
2009-2010	***Brain Injury Unit Psychology Trainee,*** Cardinal Hill Rehabilitation Hospital
2008-2009	***Neuropsychology Assessment Trainee,*** Allen Psychological Services Center
2008-2009	***Campus Representative,*** American Psychological Association of Graduate Students
2007-2009	***Teacher's Assistant,*** UK Psychology Department

HONORS, AWARDS, AND PROFESSIONAL AFFILIATIONS

University of Kentucky

2013	Recipient, *Excellent Clinical Performance Award*
2012-2013	Recipient, *Graduate School Travel Award*
2008-2013	Recipient, *RCTF Travel Award*

University of North Carolina at Greensboro (UNCG)

May 2004	First-Place Winner, *UNCG Psychology Department Poster Contest*
2003-2004	Recipient, *Undergraduate Research Assistantship*

Affiliations

American Psychological Association (APA) – *Student Member*

- APA Division 40 – Student Member
- APA of Graduate Students

International Neuropsychological Society – *Student Member*

Psi Chi National Psychology Honor Fraternity

Phi Beta Kappa National Honor Fraternity

Kentucky Psychological Association – *Student Member (2008-2012)*

PROFESSIONAL PUBLICATIONS AND PRESENTATIONS

Publications

Mason, L.H., Shandera-Ochsner, A.L., Williamson, K.D., Harp, J.P., **Edmundson, M.**, Berry, D.T.R., & High, Jr., W.M. (2013). Accuracy of MMPI-2-RF validity scales for identifying feigned PTSD symptoms, random responding, and genuine PTSD. *Journal of Personality Assessment, 95*(6), 585-593.

Shandera-Ochsner, A., Berry, D.T.R., Harp, J., **Edmundson, M**., Graue, L., Roach, A., High, Jr., W.M. (2013). Neuropsychological effects of self-reported deployment-related mild TBI and current PTSD in OIF/OEF veterans. *The Clinical Neuropsychologist, 27*(6), 881-907.

Edmundson, M., & Kwapil, T.R. (2013). A five-factor model perspective of schizotypal personality disorder. In T.A. Widiger & P.T. Costa (Eds.), *Personality Disorders and the Five-Factor Model of Personality* (3rd ed.). Washington, DC: American Psychological Association.

Mullins-Sweatt, S.N., **Edmundson, M.**, Sauer-Zavala, S.E., Lynam, D.R., Miller, J.D., & Widiger, T.A. (2012). Five-factor measure of borderline personality disorder. *Journal of Personality Assessment,* available online. doi:10.1080/00223891.2012.672504

Samuel, D.B., **Edmundson, M.,** & Widiger, T.A. (2011). Five-Factor Model prototype matching scores: Convergence within alternative methods. *Journal of Personality Disorders, 25(5),* 571–585.

Edmundson, M., Lynam, D.R., Miller, J.D., Gore, W.L., & Widiger, T.A. (2011). A five-factor measure of schizotypal personality traits. *Assessment, 18(3),* 321-334. doi: 10.1177/1073191111408228

Follingstad, D.R. & **Edmundson, M.** (2010). Is psychological abuse reciprocal in intimate relationships? Data from a national sample of American adults. *Journal of Family Violence, 25(5),* 495-508.

Widiger, T.A. & **Edmundson, M.** (2010). Diagnoses, dimensions, and DSM-V. In D. Barlow (Ed.), *The Oxford Handbook of Clinical Psychology* (1st ed.). New York, NY: Oxford University Press.

Lowe, J.R., **Edmundson, M.,** & Widiger, T.A. (2009). Assessment of Dependency, Agreeableness, and their Relationship, *Psychological Assessment, 21(4),* 543-553.

Presentations

Edmundson, M., Shandera-Ochsner, A.L., Harp, J.P., Broster, L.S., Jenkins, S., Heflin, M., High Jr., W.M., Jiang, Y., & Powell, D. (2013, February). *Methodological considerations for research in mild traumatic brain injury (mTBI) and posttraumatic stress disorder (PTSD) in combat veterans: Information from a preliminary study*. Poster presented at the International Neuropsychological Society 41st annual meeting, Waikoloa, Hawaii.

Heflin, M., Broster, L.S., Jenkins, S., Shandera-Ochsner, A.L., **Edmundson, M.,** Powell, D., High Jr., W.M., & Jiang, Y. (2012, March). *Alterations of brain function during working memory in military veterans with mild brain injury or posttraumatic stress disorder*. Poster presented at the Bluegrass Society for Neuroscience Spring Neuroscience Day, Lexington, Kentucky.

Edmundson, M., Berry, D.T.R., High Jr., W.M., Shandera-Ochsner, A.L., Harp, J.P., & Mason, L.H. (2012). *A meta-analytic review of Minnesota Multiphasic Personality Inventory (MMPI) profile elevations following traumatic brain injury*. Poster presented at the International Neuropsychological Society 40th annual meeting, Montreal, Canada (February), and the Kentucky Psychological Association Spring Academic Conference, Lexington, Kentucky (March).

Mason, L.H., Shandera-Ochsner, A.L., Harp, J.P., Williamson, K., **Edmundson, M.,** High, W.M., & Berry, D.T.R. (2012). *Differential sensitivity of the MMPI-2-RF validity scales to random responding and overreporting of PTSD symptoms*. Poster presented at the International Neuropsychological Society 40th annual meeting, Montreal, Canada (February), and the Kentucky Psychological Association Spring Academic Conference, Lexington, Kentucky (March).

Shandera-Ochsner, A.L., Berry, D.T.R., Harp, J.P., **Edmundson, M.,** Graue, L.O., Roach, A., High Jr., W.M. (2012, February). *Outcome in OIF/OEF veterans with PTSD and history of concussion*. Poster presented at the International Neuropsychological Society 40th annual meeting, Montreal, Canada.

Jaquez, S., Mullins-Sweatt, S.N., **Edmundson, M.,** Gore, W.L., & Widiger, T.A. (2011, November). *Maladaptive cognitive schemas and personality disorders in the context of general personality functioning*. Poster presented at the Association for Behavioral and Cognitive Therapies annual meeting, Toronto, Canada.

Follingstad, D.R., Rogers, M.J., & **Edmundson, M.** (2010, March). *Is psychological abuse reciprocal in couples?* Poster presented at the Southeastern Psychological Association annual meeting, Chattanooga, Tennessee.

Follingstad, D.R., Rogers, M.J., & **Edmundson, M.** (2010, March). *The nature and prevalence of American's psychological abuse*. Paper presented at the Southeastern Psychological Association annual meeting, Chattanooga, Tennessee.

Edmundson, M., Lynam, D., Miller, J., & Widiger, T.A. (2009). *A five factor instrument for the assessment of schizotypia*. Poster presented at the International Society for the Study of Personality Disorders, New York, New York (August), and the Society for Research in Psychopathology annual meeting, Minneapolis, Minnesota (September).

Edmundson, M., Samuels, D., & Widiger, T.A. (2008, September). *Five-Factor Model prototype scores: Within and across methods*. Poster presented at the Society for Research in Psychopathology annual meeting, Pittsburgh, Pennsylvania.

Edmundson, M.S., Barrantes-Vidal, N., & Kwapil, T.R. (May, 2004) *Schizotypal Ambivalence as a Predictor of Schizotypal and Borderline Symptoms in Young Adults*. Poster presented at the UNCG Undergraduate Research Assistantship Poster Session, Greensboro, North Carolina.