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DISCRIMINATING BETWEEN ADHD, ADHD WITH A COMORBID PSYCHOLOGICAL DISORDER AND MALINGERED ADHD IN A COLLEGE SAMPLE

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THESIS

A thesis submitted in partial fulfillment of the
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ABSTRACT OF THESIS

DISCRIMINATING BETWEEN ADHD, ADHD WITH A COMORBID PSYCHOLOGICAL DISORDER AND MALINGERED ADHD IN A COLLEGE SAMPLE

The current study examined the efficacy of various neuropsychological measures for differentiating ADHD and comorbid ADHD from malingered ADHD in a large state university sample. The sample consisted of 23 nonclinical individuals assigned to malinger ADHD (NLM), 9 nonclinical individuals responding honestly (NLH), 22 individuals with diagnoses of ADHD only (ADHD-H), 9 individuals with comorbid ADHD/Learning Disorder presentations (ADHD-LD), and 13 individuals with comorbid ADHD/Anxiety presentations (ADHD-ANX). Due to limited sample sizes, the ADHD-LD and ADHD-ANX participants were pooled to create a comorbid ADHD group (ADHD-CO $n = 22$). The study utilized a simulation design with a NLM group instructed to feign ADHD while the other groups responded under standard instructions. The TOMM, LMT, NV-MSVT, and CTIP variables performed well, but the DMT did not. The WAIS-IV and WJ-III variables did not adequately differentiate malingered and comorbid ADHD.

KEYWORDS: Attention Deficit Hyperactivity Disorder, Malingering, Comorbidity, Neuropsychological Assessment, College Students

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Chapter 1: Introduction

Attention Deficit/Hyperactivity Disorder

Attention Deficit/Hyperactivity Disorder (ADHD) is an Axis I psychological disorder characterized by inattentive or hyperactive-impulsive symptoms which persist for a period of at least six months. According to the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV) criteria, impairment must be present in multiple settings with an initial onset before age seven and must be more extreme than what individuals might experience in their normal developmental course (APA, 2000). ADHD has three subtypes: inattentive, hyperactive, and combined. ADHD, Predominantly Inattentive Type is diagnosed when an individual displays six or more inattentive symptoms, such as distractibility, careless mistakes, forgetfulness, difficulty organizing, problems sustaining attention, etc. ADHD, Predominately Hyperactive-Impulsive Type may be diagnosed when an individual exhibits six or more symptoms of either hyperactivity or impulsivity (APA, 2000). Relevant symptoms include excessive talking, difficulty waiting one's turn, fidgeting, leaving one's seat at inappropriate times, frequent interrupting, trouble playing quietly, etc. ADHD, Predominantly Combined Type may be diagnosed when six or more symptoms from both the inattentive and hyperactive-impulsive categories are present. ADHD, Not Otherwise Specified (NOS) may be diagnosed when criteria are met but symptoms were not present before age seven or when significant impairment is present but not all criteria are met (APA, 2000). A primary difficulty in developing accurate diagnoses in cases of adult ADHD is establishing and verifying that symptoms were present before age seven.

Rates of diagnosed adult ADHD have increased dramatically over the past two decades, likely in response to the growing awareness that the ADHD phenomenon is not confined to childhood but often persists well into adulthood (Quinn, 2003). The DSM-IV (APA, 2000) estimated that the prevalence of ADHD in school-age children ranges from three to seven percent; however, data for prevalence in adulthood was limited at the time of publication. The newest manual, the DSM-5 (APA, 2013), estimates that approximately 2.5% of the general adult population may have ADHD, though information is still limited. Both accurate diagnosis and accurate prevalence estimates are complicated by the DSM-IV diagnostic criterion requiring that symptoms be present before the age of seven because adults may have trouble recalling childhood impairment and judging whether it was more extreme or distressing than what their peers may have experienced.

Malingering and ADHD

Quinn (2003) suggested that malingering may be part of the reason why adult ADHD is so difficult to diagnose. Malingering has been defined by the DSM-IV-TR as "the intentional production of false or grossly exaggerated physical or psychological symptoms, motivated by external incentives" (APA, 2000, p. 739). Base rates of malingering are difficult to obtain since malingerers rarely confess, but it is logical to assume that the prevalence of malingering would vary, at least in part, in accordance with the context of the assessment. In other words, base rates of malingering are assumed to be higher in the context of litigation or compensation seeking than what one would expect to find in an employment setting or child custody case. Malingering of ADHD is now

recognized as a widespread problem, particularly in cases where there is potential for secondary gain (Harrison, 2006).

Among young adults, particularly in a college setting, there is an array of incentives, or potential benefits an individual may receive upon successfully malingering ADHD. Possible incentives include academic accommodations, performance-enhancing drug effects, and recreational use of stimulant medication (Harrison, 2006; Kane, 2008; McCabe, Knight, Teter, & Wechsler, 2005). The transition from high school into college can be a difficult time for young adults due to the increased workload, responsibility, and competition (Kane, 2008). College students likely feel external pressure secondary to the increased demands placed upon them and a heightened fear of failure. These individuals may observe that friends or other students seem to have an easier time completing assignments and tests because of special accommodations they receive for their ADHD diagnosis, such as extra time on tests and assignments, separate and individual testing, access to instructor notes, lighter workloads, financial aid, and use of electronic aids (Harrison, 2006). The individual may discern the advantages to successfully faking ADHD and schedule a consultation with the on-campus clinic or a primary care physician in pursuit of accommodations.

Similarly, individuals may be motivated to fake ADHD to receive a prescription for stimulant medications (Quinn, 2003; Sullivan, May, & Galbally, 2007). It is not uncommon for individuals to purchase or otherwise obtain prescription medications from an acquaintance during the more stressful times of the semester. McCabe et al. (2005) estimated that as many as 7% of college students surveyed had used prescription stimulant medications for non-medical purposes at some point. If this behavior is

reinforced with enhanced cognitive focus and increased ability to stay awake, the individual may decide it would be beneficial to receive a personal prescription to maximize school performance.

Another external motivation for attempting to malinger an ADHD diagnosis is even more concerning. Individuals may fake ADHD to acquire stimulant medications for recreational use (Conti, 2004). A study by Quintero (2009) stated that poly-drug use involving pharmaceuticals and including stimulants was reported for an alarming 90% of the college population studied. In 2000, Babcock and Byrne found that as many as 16% of students at a public, liberal arts university admitted to recreational use of methylphenidate, and Booksh, Pella, Singh, and Gouvier (2010) noted that current stimulant abuse rates appear to be even higher than they were 10 years ago. Stimulant medications may be inhaled or injected, and it has also become fairly common for individuals to mix different drugs together to intensify their effects, often combining stimulant medications with alcohol and other psychoactive substances to prolong feelings of euphoria (Harrison, 2006). This practice has some very obvious and serious risks. Thus, it has grown increasingly important to identify objective ways of detecting malingering in ADHD evaluations at both the local campus and wider community levels to prevent the unjust acquisition and dangerous misuse of prescription stimulant medications.

Research on malingered ADHD.

The research that has been conducted on malingered ADHD up to this point illustrates the ease of feigning ADHD, especially considering that measures of motivation and effort are not usually included in ADHD evaluations. Because ADHD is typically

diagnosed with self-report measures, it is relatively easy for individuals to endorse symptoms that they do not actually have, and very few self-report scales are equipped with validity checks to detect feigning (Harrison, 2006; Quinn, 2003). In this technological age, individuals motivated to feign ADHD can also find an abundance of information on the internet, inclusive of medical and diagnostic criteria. As a result of the accessibility of diagnostically relevant information and the lack of validity scales in most self-report tests, these measures are unable to differentiate true ADHD from feigned ADHD and should not be the sole means of evaluation in ADHD assessment (Fisher & Watkins, 2008; Quinn, 2003).

The importance of understanding and detecting malingering has only recently been recognized by researchers in the field of clinical psychology, and research up to this point has primarily focused on malingering in areas such as mild traumatic brain injury (mTBI). 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. Several of the published studies have utilized the differential prevalence design in the context of an ADHD evaluation. In differential prevalence designs, the researcher is assuming that two different groups of individuals (e.g. compensation seeking versus non-compensation seeking) will have different base rates of malingering, and the assumption is usually based on potential for external gain or perceived incentives (Rogers, 2008).

In one such archival study, Marshall, Schroeder, O'Brien, Fischer, Ries, Blesi, et al. (2010) classified individuals as exhibiting suspect or credible effort based on their performance on various symptom validity tests. The symptom validity test (SVT) is a widely accepted strategy utilized in the detection of malingering. Most SVTs typically

employ a two-item, forced-choice paradigm where the target stimulus is initially presented, and after a short delay, the target stimulus is presented again alongside a second stimulus (Willison & Tombaugh, 2006). The task for the participant is to recognize the original target stimulus and select it from among the two choices. SVTs have been the driving force in malingering test development and research up to this point because they have demonstrated high sensitivity to malingering (Willison & Tombaugh, 2006).

Marshall et al. (2010) examined the effectiveness of various SVTs in identifying symptom exaggeration. All participants completed the same core test battery in a referral for ADHD evaluation, and they were classified as exhibiting suspect effort if they either: failed two SVTs, failed one SVT and gave an unusually impaired performance on a cognitive test, or if they failed a single SVT or appeared unusually impaired on a cognitive test and had invalid completion of behavior rating scales (Marshall et al., 2010). Four groups were defined and compared retrospectively: ADHD credible, non-ADHD credible, ADHD suspect, and non-ADHD suspect. The results of the study revealed sensitivity to suspect test-taking effort ranging from 47% to 64% for the b Test e score, the Test of Variable Attention (TOVA) reaction time variability, the Conners' CPT-II omission errors, the TOVA omission errors, and the Word Memory Test (WMT) consistency and immediate recall scores, in ascending order (Marshall et al., 2010).

Other studies utilizing differential prevalence designs have classified sub-optimal effort or non-credible performance based solely on failure of the WMT (Sullivan et al., 2007; Suhr, Hammers, Dobbins-Buckland, Zimak, & Hughes, 2008). Sullivan et al. (2007) utilized this design in the context of both ADHD and LD evaluations and found

that 47.6% of individuals exhibited suboptimal effort based on this criterion. Analyses of ADHD only individuals revealed that the suboptimal effort group produced significantly worse scores on the Immediate Recognition, Short-Delay Recall, and Long-Delay Recall trials of the CVLT-2. The suboptimal effort group was also found to produce higher CAARS scores (Sullivan et al., 2007).

Suhr et al. (2008) compared a non-credible performance group with an ADHD group and a psychological symptoms control group on neuropsychological test performance. Their results showed that 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). A more recent study by Suhr, Sullivan, and Rodriguez (2011) extended the findings of the former study, using a subset of the original sample, to examine Conner's Continuous Performance Test (CPT). The non-credible group performed significantly worse than psychological symptoms controls on many 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 et al., 2011).

Other studies have utilized a simulation design where the malingering groups are constructed in analogue research (Rogers, 2008). In this design, participants are typically given a scenario describing a hypothetical situation in which they would receive external benefits if they were to successfully malinger deficits. Monetary incentives are

commonly offered to the participants to enhance their motivation to fake well, and test performances of the individuals instructed to malinger can then be compared with clinical or normal controls, depending on the purpose of the study (Rogers, 2008).

One of the first published studies to utilize a simulation design for examining malingering in the context of ADHD compared the performance of controls, simulated malingerers, and ADHD participants on the Integrated Visual and Auditory Continuous Performance Test (IVA CPT) and the ADHD Behavior Checklist (Quinn, 2003). Quinn found that the ADHD Behavior Checklist was successfully faked with no significant differences between the ADHD participants and simulators. However, 81% of the scales on the IVA CPT could not be faked, and the CPT exhibited 94% sensitivity to malingering with specificity of 91% (Quinn, 2003). Fisher and Watkins (2008) found further evidence that individuals can fake self-report scales with relative ease. Of the 189 individuals with no significant history of ADHD instructed to simulate in their study, 93% of those who completed the College ADHD Response Evaluation (CARE) and 77% of those who completed the ADHD Behavior Checklist successfully faked the scales after studying ADHD diagnostic criteria for only five minutes (Fisher & Watkins, 2008).

Another simulation study by (Booksh et al., 2010) compared ADHD simulators with ADHD controls and normal controls on objective measures of attention. They found that the simulation group performed significantly worse than the ADHD control group on half of the objective measures utilized, including the TMT Part A, CPT mean *t* scores, and the sum of CPT elevation (Booksh et al., 2010). In 2008, Frazier, Frazier, Busch, Kerwood, and Demaree 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 (RD). They found that at varying cut scores, these two measures were able to differentiate simulated ADHD and RD from normal controls with sensitivity rates generally above 80% and higher for RD than ADHD (Frazier et al., 2008). However, this study provided no comparison with clinical controls.

A 2007 study by Harrison, Edwards, and Parker compared test performance of ADHD simulators with both normal and ADHD controls. The non-ADHD participants in their study included 70 undergraduate students. Data from these participants were compared with archival data from 72 ADHD cases. All participants in the study completed the Conners' Adult ADHD Rating Scale (CAARS) and subtests from the Woodcock Johnson Psychoeducational Battery-III (WJPB-III), specifically the Reading Fluency and Processing Speed subtests (Harrison et al., 2007). Using the recommended cut score for the CAARS, most participants in the "faking" group were able to successfully meet the criteria for a diagnosis of ADHD, but they trended toward higher scores than that of the ADHD group. Additionally, individuals in the "faking" group performed significantly worse on WJPB-III subtests using a liberal cut score (Harrison et al., 2007). From their results, the authors suggest that exaggerated high scores on self-report CAARS items may be used in conjunction with unlikely low scores on WJPB-III and similar standardized tests to help identify individuals feigning ADHD (Harrison et al., 2007).

Two recent studies have utilized more comprehensive and extensive test batteries with a combination of embedded indices from classic neuropsychological tests and symptom validity tests to compare test performance of simulated malingerers with a

variety of control groups in a college population (Sollman, Ranseen, & Berry, 2010; Jasinski, Harp, Berry, Shandera-Ochsner, Mason, & Ranseen, 2011). Sollman et al.'s study (2010) compared ADHD simulators with ADHD controls and normal controls on a wide array of measures, including self-report scales, neuropsychological measures, and feigning and symptom validity tests. Self-report scales included the ADHD rating scale (ARS) and the Conners' Adult ADHD Rating Scale (CAARS). Neuropsychological measures included the Conners' Continuous Performance Test-II (C-CPT), the Stroop Color-Word Test, the Wechsler Memory Scale Word Lists subtest (WMS-WL), and the Nelson-Denney Word Reading Test (NDWR). Malingering instruments included the Miller Forensic Assessment of Symptoms Test (M-FAST), a psychiatric feigning measure, and symptom validity tests such as the Digit Memory Test (DMT), the Letter Memory Test (LMT), the Test of Memory Malingering (TOMM), and the Nonverbal-Medical Symptom Validity Test (NV-MSVT).

Sollman et al. (2010) found that both self-report scales were highly sensitive to ADHD, but were unable to differentiate honest ADHD from malingerers. Comparisons across neuropsychological measures revealed that feigners performed significantly worse than ADHD controls on the Stroop Word and Color mean scores and on contrast 2 of the WMS (Sollman et al., 2010). Evaluation of the C-CPT found this measure insensitive to ADHD in the sample, though the feigning group was able to generate typical ADHD profiles. Analysis of the SVTs utilized in the study revealed that the TOMM, DMT, LMT, and NV-MSVT all exhibited at least moderate sensitivity to feigning and good specificity, with robust effect sizes ranging from -.96 and -.97 on the scales of the NV-

MSVT to as high as -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) used a modified battery to compare the test performance of ADHD simulators with participants in various experimental conditions. The comparison groups for the study included an honest normal control group, an ADHD malingering group, an ADHD honest group, an ADHD exaggerate group, and a Mood disorder group. Participants completed the CAARS, the Reading fluency subtest of the Woodcock-Johnson Test of Achievement-III (WJ-III), the Coding, Symbol Search, and Digit Span subtests of the Wechsler Adult Intelligence Scale-IV (WAIS-IV), the Computerized Test of Information Processing (CTIP), and the following SVTs: the DMT, LMT, TOMM, NV-MSVT, and b Test (Jasinski, Harp, et al. 2011). The most significant results of this study were the robust findings surrounding the Symptom Validity Tests. The TOMM, DMT, LMT, and NV-MSVT differentiated the feigning group from the ADHD group by nearly one standard deviation. Effect sizes ranged from -1.01 to -1.24 with malingerers exhibiting significantly worse performance on all measures. The neuropsychological measures also yielded some interesting results. Many of the CTIP variables were able to discriminate feigning from ADHD with effect sizes ranging from .82 to 1.01 (Jasinski, Harp, et al., 2011). The WAIS-IV PSI and Symbol Search subtest distinguished malingerers from honest responders as well as the SVTs, with the largest effect sizes of -1.47 and -1.52, respectively. Finally, the WJ-III also differentiated malingerers from honest ADHD individuals with effect sizes of -1.27 and -1.25 (Jasinski, Harp, et al., 2011). The latter two studies provide evidence for the combined utility of symptom validity tests and

neuropsychological measures in the evaluation of adult ADHD. Consideration of the results from the various studies on malingered ADHD should inform the measures selected for use in ADHD evaluations and increase recognition of which measures warrant further investigation in experimental settings.

Comorbid ADHD

One area of the literature on feigned ADHD that is currently undeveloped is research on comorbid ADHD presentations. One study found that of the 335 adults interviewed who met criteria for ADHD, 49% also met criteria for another DSM-IV Axis I disorder (around 71% for lifetime Axis I comorbidity), and 50.7% also met criteria for an Axis II diagnosis (Cumyn, French, & Hechtman, 2009). Individuals with ADHD had a much higher likelihood of psychological symptoms than those without ADHD, and the most common comorbidities were anxiety and mood disorders (Cumyn et al., 2009). In their sample of 45 adult ADHD patients, Torgersen, Gjervan, and Rasmussen (2006) found that the lifetime prevalence of at least one comorbid disorder was 86.7%, with major depression greater than 50%, antisocial personality disorder approaching 50%, substance abuse around 50%, and learning disabilities in more than 20% of the sample. Sobanski (2006) asserts that of all patients with ADHD in adulthood, 65-89% suffer from at least one additional psychiatric disorder during their lifetime, with some of the highest lifetime comorbidity rates for anxiety disorders (40-60%). Thus, there is some consistency in the literature regarding high base rates for comorbidity in the adult ADHD population.

Miller, Nigg, and Faraone (2007) administered structured clinical interviews (SCID-I and II) to 152 adults with ADHD and 211 adult controls to determine Axis I and

Axis II comorbidity. For Axis I disorders, ADHD, Combined Type was significantly associated with the presence of externalizing disorders with 40.6% of the sample evidencing two or more externalizing disorders. ADHD, Combined and Inattentive types were similarly associated with internalizing disorders, with more than 30% of individuals warranting a diagnosis of at least one internalizing disorder (Miller et al., 2007). These percentages were significantly different from the control group. Furthermore, Miller et al. (2007) found that individuals with ADHD were also more likely to have Cluster B and C personality disorders (PD), with nearly half (47.4%) of the 18 individuals in the ADHD, Hyperactive group evidencing at least one Cluster B PD (Miller et al., 2007).

Epidemiological studies have indicated that when applying strict diagnostic criteria, ADHD and a Reading Disorder (RD) may be apparent in as many as 15% to 40% of individuals (APA, 2000; Rucklidge & Tannock, 2002). There is very little information available about how comorbid disorders may alter the appearance or presentation of ADHD and influence ADHD evaluations. Various comorbid disorders may enhance or even negate the symptoms of ADHD, or have little noticeable effect. Because such a significant portion of individuals with ADHD also have a second diagnosis, it is crucial to gain a better understanding of how comorbid diagnoses affect test performance, for the sake of ecological validity. Furthermore, it is essential to evaluate the utility of effort tests and neuropsychological embedded indices in discriminating between comorbid presentations and malingering.

The available research on how comorbid ADHD diagnoses affect performance on effort tests and neuropsychological tests is scarce. One study of adolescents with ADHD, RD, or comorbid ADHD + RD found differential deficits in test performance (Rucklidge

& Tannock, 2002). While the ADHD only group was slower at processing speed tasks (WISC-III coding and symbol search) and at naming colors and objects, the RD only group exhibited poorer verbal working memory and slower letter naming. Interestingly, the comorbid group exhibited cognitive deficits in addition to those of the ADHD group in areas such as overall reaction time, mental arithmetic, and working memory as measured by the WISC-III digits forward and backward (Rucklidge & Tannock, 2002).

As reviewed above, various scholarly articles have provided rather high estimates of comorbidity in the adult ADHD population, with some of the highest Axis I estimates for mood disorders, anxiety disorders, learning disorders, and substance abuse. However, no studies have yet examined whether the feigning measures which demonstrate strong sensitivity to feigned ADHD versus true ADHD can also differentiate feigned ADHD from ADHD with a second psychological disorder diagnosis that one might reasonably expect to complicate or impact test performance.

Purpose of the Present Study

The present study used a simulation design and was conducted similarly to the recent study by Jasinski, Harp, et al. (2011) with a few methodological changes. One significant difference between the studies was the groups under consideration. Comparable to the previous study, the present study examined differences between non-clinical individuals instructed to feign ADHD (NLM) and honest ADHD (ADHD-H) individuals. However, this study did not include an exaggerate ADHD group and only utilized a very small number of non-clinical controls as a manipulation check because the present study's primary focus was to increase understanding of the differences between NLM, ADHD-H, and individuals with ADHD and other psychological diagnoses.

Therefore, the current study added another clinical control group comprised of individuals with ADHD and a comorbid psychological disorder (ADHD-CO) instead of the MOOD group utilized in the previous study. The ADHD-CO group was derived from combining two initially separate comorbid groups: an ADHD and Anxiety Disorder comorbid group and an ADHD and Learning Disorder comorbid group. It was felt that examining the discriminant ability of various instruments in the context of ADHD, comorbid ADHD, and malingered ADHD was the next step to understanding differences in test performance in ADHD assessments. There were also several modifications to the pre-test measures and test battery, such as the addition of the Wide Range Achievement Test, which was geared towards gathering more information about the ADHD-CO group.

The hypotheses of the study included the following: 1) the NLM (normal individuals responding under malingering instructions) group would perform significantly worse on measures of neurocognitive feigning as well as cognitive ability tests affected by attention processes than the ADHD-H (individuals with ADHD responding under standard instructions) group and ADHD-CO (individuals with comorbid ADHD/LD or ANX responding under standard instructions) group and would self-report significantly more ADHD related symptoms; 2) the ADHD-CO group would perform similarly to the ADHD-H group on neurocognitive feigning measures and self-reported ADHD symptoms, but pretest screening and achievement measures would likely differentiate the two groups; and 3) the Digit Memory Test (DMT), the Letter Memory Test (LMT), the Test of Memory Malingering (TOMM), and the Nonverbal Medical Symptom Validity Test (NV-MSVT) would demonstrate the best sensitivity to feigning with high specificity for ADHD.

Chapter 2: Method

Participants

The 76 participants in this study were undergraduate students at the University of Kentucky. The sample included 32 nonclinical participants and 44 participants with a diagnosis of ADHD. An ADHD screening form was included in the undergraduate mass screening session (PSY 100 subject pool) for the purpose of identifying and recruiting ADHD and non-ADHD individuals (see Appendix A). Participants from the subject pool were compensated with 5 of their required 6 research credits. The majority of participants were recruited via this route, though several individuals responded to fliers (see Appendix B) posted in the Disability Resource Center and were compensated with $40 for their time.

The first subsample included 32 nonclinical individuals who were recruited from the psychology subject pool. In order to be selected for this group, the participants could not have a history of diagnosed or suspected ADHD, learning disorders, brain injury, neurological disorders, or psychiatric disorders. Nine of the nonclinical participants were randomly assigned to respond under standard instructions as a manipulation check for the assessment protocol (NLH) and 23 were randomly assigned to the malingering group (NLM).

The second subsample of participants included 22 individuals with ADHD diagnoses (ADHD-H). To be included in this group, individuals had to have a verifiable ADHD diagnosis before the age of 18, though this stricture was amended to “by age 12” part way through the study. A phone interview was used to establish that these diagnoses were received from or verified by a mental health practitioner and were not based solely

on either self-reported symptoms and/or a brief consultation. These individuals also could not have a history of brain injury, neurological disorders, or psychiatric disorders.

The third subsample of participants consisted of 9 individuals with verifiable comorbid ADHD and Learning Disability diagnoses (ADHD-LD). The ADHD-LD group included individuals with diagnosed reading and writing learning disabilities, because these learning disabilities most commonly co-occur with ADHD and are more apparent than math LD in the college population. Individuals with a history of brain injury, neurological disorders, or psychiatric disorders were excluded. A history of depression was not considered grounds for exclusion from this group given the high rates of comorbidity with ADHD and LD and the relatively low base rate of comorbid ADHD and LD in the college population. To be included in this group, individuals had to have an LD diagnosis based on more than self-report or a brief consultation. The same diagnostic restrictions which applied to the ADHD only group applied to this group as well, except the ADHD diagnostic age was not amended to "by age 12."

The final subsample of participants consisted of 13 individuals with verifiable comorbid ADHD and an anxiety disorder (ADHD-ANX). Individuals in this group had to have verifiable ADHD and Anxiety diagnoses, based on more than a brief consult and/or self-report. Exclusion criteria for this group included a history of learning disabilities, brain injury, neurological disorder, and other psychiatric disorders, excepting a history of depression. The same diagnostic restrictions which applied to the ADHD-H and ADHD-LD groups were used with this group as well.

Due to small sample sizes in the latter two groups, they were combined to form a comorbid ADHD group (ADHD-CO $n = 22$). Demographic characteristics of the sample

(age, gender, race, etc.) approximated the larger undergraduate population, with the exception of race which was much less heterogeneous in the sample. Individuals below the age of 18 were not included in the study. Individuals currently being treated for ADHD were asked to refrain from use of stimulant medications for 12 hours prior to testing.

Design

The study utilized a simulation design. The 32 individuals recruited with no diagnosed psychopathology were be randomly assigned to two groups. A group of 9 individuals were instructed to respond honestly, giving their best effort throughout the test battery. This small group functioned as a manipulation check for the assessment protocol. The remaining 23 individuals comprised the NLM group. Participants in this group were given a scenario (see Appendix I) describing a situation where it would be to their benefit to successfully fake ADHD and receive a diagnosis based on their test results. They were then presented with information on common symptoms and presentations of ADHD (see Appendix J), easily accessible via the internet. Once the participants had adequate time to look over the symptom list, they were instructed to respond to all test measures as if they are attempting to receive a diagnosis of ADHD, without creating an obvious faking presentation. Participants in this group were offered a "conditional" incentive of $25 if they successfully simulated ADHD without being detected by the tests. In reality, all participants in the feigning group received this monetary compensation during the debriefing session, as required by the Institutional Review Board. Both the honest ADHD and comorbid ADHD clinical groups were given standard instructions for completion of the test battery. This design was chosen to allow

the researcher to evaluate the hypotheses based on comparisons of group performance and to determine estimations of classification accuracy for each of the tests at various cut scores. This design also permitted the researcher to examine which measures, if any, best differentiate between the pure ADHD and comorbid ADHD groups.

Assessment

Pre-test measures.

The following pre-test materials were utilized in this study: an ADHD screening measure, a brief phone interview, informed consent forms, and a demographics questionnaire. The screening measure (see Appendix A) was included in the psychology subject pool/mass screening session to recruit participants. It asked students to indicate whether they had been diagnosed with ADHD, a Learning Disorder, an Anxiety Disorder or additional psychiatric or neurological disorders. The form also requested additional information about ADHD and other diagnoses (e.g. diagnostic age, medications, accommodations, etc.). The phone interview (see Appendices C, D, E, and F) was utilized to discern whether a given individual wished to participate in the study, whether that individual met the inclusion and exclusion criteria for the study, and which experimental condition was most appropriate given the individual's psychiatric history. The informed consent form provided participants with information about the study, including risks and benefits of the study, and required the signature of the participant and researcher before resuming study procedures. The demographics questionnaire (see Appendix G) asked the participant to provide some personal information, including age, race, gender, etc. The questionnaire also asked individuals to indicate their psychiatric diagnoses and whether they were receiving treatment at the time of evaluation.

Pre-test measures administered to all participants included the Adult ADHD Self-Report Scale (ASRS), the Beck Depression Inventory-II (BDI-II), the Beck Anxiety Inventory (BAI), and the Word Reading, Sentence Comprehension, and Spelling subtests of the Wide Range Achievement Test-IV (WRAT-4). All of the pre-test measures were administered under standard instructions before specific condition instructions were given. These instruments were utilized with the purpose of gathering more information about between group differences on pre-existing symptomatology. Given that Jasinski, Harp et al. (2011) found the highest base rates for these specific comorbidities (Depression, Learning Disorder, and Anxiety) in their preliminary sample, these measures were considered appropriate for gathering additional information about the participants with comorbid ADHD presentations recruited for this study.

Adult ADHD Self-Report Scale (ASRS). The ASRS (Kessler, et al., 2005) is a brief instrument requiring about 5 minutes to complete. It inquires about 18 DSM-IV ADHD symptoms on Likert scales, and as a self-report measure for ADHD, the ASRS has demonstrated adequate sensitivity at 56.3% and strong specificity at 98.3%, with an overall hit rate of 96.2% (Kessler, et al., 2005).

Beck Depression Inventory-II (BDI-II). The BDI-II (Beck, Steer, & Brown, 1996) was used in the pre-test session to gather information about the current depression symptoms of participants. The BDI-II is a self-report scale requiring five to 10 minutes completion time. The instrument consists of 21 items designed to gauge current symptoms of depression (during the two weeks prior to examination). The responses are weighted, where 0 represents lack of symptoms and 4 represents severe symptomatology. The maximum score on the measure is a 63, and scores are classified in ranges from

minimal depression scores of 0-13 and mild scores of 14-19 to moderate scores of 20-28 and severe scores of 29-63. The BDI-II has demonstrated fairly impressive (r = .93) test-retest reliability (i.e. high correlation between test scores at Time 1 and Time 2), providing some evidence for construct validity of the instrument (Beck, et al., 1996).

Beck Anxiety Inventory (BAI). The BAI (Beck & Steer, 1993) is similar to the BDI-II but was designed as a screening tool for symptoms of anxiety. The BAI is also a 21-item self-report inventory requiring participants to endorse their experience of anxiety symptoms in the past week. The BAI also has a maximum score of 63. The descriptive categories are somewhat different from the BDI-II, however, with minimal anxiety scores of 0-7, mild scores of 8-15, moderate scores of 16-25, and severe scores of 26-63. The BAI has also demonstrated strong test-retest reliability, indicating that both of these screening instruments assess stable rather than highly variable symptoms (Beck & Steer, 1993).

Wide Range Achievement Test-IV (WRAT-4). The WRAT-4 (Wilkinson & Robertson, 2006) is a widely used achievement test comprised of four subtests in word reading, sentence comprehension, spelling, and math computation, the first three of which were included in the present study. The word reading subtest requires individuals to recognize and name letters and pronounce words out of context. Sentence comprehension is a subtest novel to this edition which measures an individual's ability to gather meaning from words and understand ideas presented in sentence form. Finally, the spelling subtest requires the test-taker to write letters and words spoken aloud by the examiner. The test is available in two alternate forms, and administration time for either form takes 15 to 45 minutes depending on the test-taking style and age of the examinee

(Wilkinson & Robertson, 2006). Past research (Rucklidge & Tannock, 2002) examined the performance of adolescents with ADHD, Reading Disorder, or comorbid ADHD and Reading Disorder on the Reading and Spelling subtests of the WRAT-3. In this study, normal controls and individuals with ADHD performed comparably on the Reading subtest, and the Reading Disorder group and comorbid ADHD and Reading Disorder group exhibited lower performances. On the Spelling subtest, normal controls performed better than individuals with ADHD, who in turn performed better than individuals with Reading Disorder and comorbid ADHD and Reading Disorder.

Test battery.

At the conclusion of the pre-test session, participants were given their individual packets with their instructions to complete the core test battery accordingly. The core test battery included a combination of self-report measures, symptom validity tests, and other neuropsychological measures thought to differentiate between honest responders and feigners. The battery was administered in counterbalanced order and included the following instruments: The Barkley Adult ADHD Rating Scale-IV (BAARS-IV), the Wechsler Test of Adult Reading (WTAR), the Digit Memory Test (DMT), the Letter Memory Test (LMT), the Nonverbal Medical Symptoms Validity Test (NV-MSVT), the b test, the Test of Memory Malingering (TOMM), the Computerized Test of Information Processing (CTIP), the Digit Span, Symbol Search, and Coding subtests of the Wechsler Adult Intelligence Scale-IV (WAIS-IV), and the Reading Fluency subtest of the Woodcock Johnson-III Tests of Achievement (WJ-III).

Barkley Adult ADHD Rating Scale-IV (BAARS-IV). The BAARS-IV (Barkley, 2011) assesses current ADHD symptoms and recollections of childhood impairment with

both self-report and other-report forms based directly on the DSM-IV diagnostic criteria. The scale for current symptomatology was utilized in this study to gauge differences in self-reports between individuals completing the scale under malingering instruction versus those with genuine ADHD diagnoses. This scale includes an additional section targeting newly identified symptoms specifically relevant to ADHD, Inattentive Type. The long version of the scale takes approximately 5 to 7 minutes to complete. The scale has evidenced high internal consistency (α=.92) and high test-retest reliability (*r*=.75) for current ADHD symptoms and childhood symptoms scores, respectively (Barkley, 2011).

The BAARS-IV has Inattention, Hyperactivity, and Impulsivity indices, and the raw scores combine to produce a Total ADHD symptom index. An additional category, Sluggish Cognitive Tempo (SCT), is measured but not included in the overall ADHD score. Aside from these raw scores which provide an overall picture of symptom endorsement, the BAARS-IV also gauges symptom severity with a "Symptom Count" variable which measures the number of items to which an individual responds with either a "3" or a "4," with "4" being the most often or most severe. Symptom counts are calculated for each of the aforementioned variables, with the Hyperactivity and Impulsivity indices combined to produce a single symptom count (Barkley, 2011). All of the aforementioned variables were examined in this study.

The Wechsler Test of Adult Reading (WTAR). The WTAR (Wechsler, 2001) is an instrument that is commonly used to obtain premorbid estimates of intelligence because it has shown resistance to neurologic injury and disorders. In light of the decision to administer the WRAT-4 Word Reading subtest under standard instruction during the pre-test session, the WTAR was given under experimental manipulation after individuals

received their condition instructions in order to gather information about how malingering instruction could potentially affect word reading scores. The WTAR requires individuals to read a list of atypically pronounced words aloud as the words become increasingly difficult, and the test administration time approximates 5-10 minutes (Wechsler, 2001).

Nonverbal Medical Symptom Validity Test (NV-MSVT). The NV-MSVT (Green, 2008) is a computer-administered SVT that is theoretically similar to both the WMT and the MSVT where several subtests at different levels of difficulty measure memory and cognitive effort (Wager & Howe, 2010). The NV-MSVT uses a list of 10 pictures, each with a pair of items, which are presented across two trials. The participant must verbally name the parts of each picture aloud and then perform an immediate recognition task by choosing the correct picture of two options (Immediate Recall –IR). Following a 10 minute delay, the participant completes a Delayed Recall (DR) task, similar in structure to the IR task. However, the DR task incorporates the more difficult DR-Archetypes and DR-Variations subtests into the same trial to enhance detection of diminished effort. The DR-A task involves pairing of a previously seen foil with a novel foil, and the DR-V involves pairing of the original target with a slightly modified picture. The test also involves a paired associations task where the individual is shown one part of an original picture and asked to identify what went with it and a free recall task where the individual is asked to name as many of the original items as possible from memory (Green, 2008; Wager & Howe, 2010). Much of the test is conducted by the computer in the absence of the examiner, and the computer generates feedback regarding accuracy of responses. The manual reports specificity estimates of 95% for dementia patients and 100% for control

groups. The manual also indicates that the NV-MSVT has a sensitivity rate in detecting poor effort of 72.5% (Green, 2008).

In a study comparing the NV-MSVT and the TOMM in outpatients undergoing disability assessment, Green (2011) found that twice as many individuals failed the NV-MSVT as the TOMM. He attributed this finding to the NV-MSVT detecting more instances of poor effort given that the individuals with more abnormal brain scans were not typically the same individuals who failed the NV-MSVT. Furthermore, results showed that individuals detected as performing with suboptimal effort were likely to fail the easier subtests of the NV-MSVT while passing the more difficult tasks. He concluded that the NV-MSVT exhibits comparable, if not improved, sensitivity to feigning as that of the TOMM, and higher specificity to severe cognitive impairment (Green, 2011). Recent research suggests that the NV-MSVT has strong specificity (93%) but moderate sensitivity (47%) for detecting feigned versus genuine ADHD (Sollman et al., 2010). Jasinski, Harp, et al. (2011) found similar estimates, with specificity of 95% and sensitivity of 50%. More research is needed on this relatively new measure.

Digit Memory Test (DMT). The DMT (Hiscock & Hiscock, 1989) is a widely used forced-choice measure which presents examinees with a five-digit stimulus, and then utilizes an immediate recall trial and a delayed recognition trial. The delay periods increase from 5 seconds up to 15 seconds to increase the perceived difficulty of the test. It is a face valid test of memory which is intentionally easy and relatively insensitive to brain damage. In a meta-analysis conducted by Vickery, Berry, Inman, Harris, and Orey (2001) the DMT performed better at discriminating between honest responders and dissimulators than the Dot Counting Test, the 15-Item Test, the 21-Item Test, and the

Portland Digit Recognition Test. The 32 studies included in the meta-analysis produced combined estimates of good to adequate sensitivity (89.7% to 71.3% for honestly responding clinical and normal individuals, respectively) for the DMT and excellent specificity (91.1% to 98.9%). The DMT has been studied in the detection of malingered ADHD, where it demonstrated 100% specificity and 43% sensitivity (Sollman, et al., 2010). In Jasinski, Harp, et al. (2011), the DMT exhibited improved sensitivity of 50%, but somewhat diminished specificity of 95%.

Letter Memory Test (LMT). The LMT (Inman, Vickery, Berry, Lamb, Edwards, and Smith, 1998) is comparable to the DMT, but it uses cards containing increasing numbers of letters. After a five-second delay, the participant is asked to recognize the letters they were shown from two, three, or four options of letter combinations. The nine-trial, 45-item test was originally developed as a computer administered test, but was later adapted to a manual form (Schipper, Berry, Coen, & Clark, 2008). On both the LMT and DMT, errors in excess of a predetermined cut-off score suggest malingering of memory or attention impairment.

A known-groups cross-validation of the LMT was conducted by Vagnini, Sollman, Berry, Granacher, Clark, Burton, et al. (2006) to determine how well the LMT was able to discriminate between individuals with TBI responding honestly and probable cognitive feigners. Their study revealed sensitivity of 64% and specificity of 98.4%. Cross-validation of the manual form of the LMT demonstrated sensitivity of 80% in differentiating probable cognitive feigning from an honest control group and specificity of 95% (Schipper et al., 2008). It has also demonstrated strong specificity (98%) and adequate sensitivity (76%) in detecting malingered neurocognitive dysfunction (Sollman

& Berry, 2011). A recent study examining the LMT in detection of malingered ADHD found very strong specificity (93%) and moderate sensitivity (52%) estimates (Sollman, et al., 2010). Furthermore, the study by Jasinski, Harp, et al. (2011) found slightly improved estimates using the recommended cutting score of <93 (SN=54.5, SP=96.4).

Test of Memory Malingering (TOMM). The TOMM (Tombaugh, 1996) is another forced-choice measure which has been studied extensively in feigned traumatic brain injury samples and is widely used for the detection of malingering. The TOMM presents 50 line drawings in 3-second intervals across two learning trials. Participants are asked to recognize as many of the 50 drawings as they can when presented with two alternatives (one target, one foil). Following a 20-minute delay, participants complete a retention trial where they are again presented with 50 two-item alternatives and asked identify the original target item. The TOMM is a relatively simple task which can be completed successfully by people with severe TBI, and it is considered a strong tool for evaluations where malingering may be suspected (Vickery, et al., 2001). Rees, Tombaugh, and Boulay (2001) found that a 90% correct cutting score on the trials of the TOMM had high sensitivity and specificity for malingered memory deficits. Furthermore, a recent study (Sollman, et al., 2010) found that the TOMM performed adequately when detecting feigned ADHD, with strong specificity of 97% but reduced sensitivity of 47% at Trial 2. Jasinski, Harp, et al. (2011) found 90% specificity and 59.1% sensitivity for Trial 1 % Correct and 100% specificity and 45.5% sensitivity on Trial 2 % Correct and Retention % Correct.

b Test. The b Test (Boone, Lu, Sherman, Palmer, Back, Shamieh, et al., 2000) is a fairly brief measure of neurocognitive feigning requiring examinees to attend to multiple

pages of the letters “b”, “d”, “p” and “q,” as well as other similar but non-letter stimuli, of varied sizes and orientations. The examinee is instructed to circle every letter “b” on each page as quickly as possible. The various computed scores include time to completion, errors of commission, and errors of omission. An overall E-Score is calculated via an equation incorporating all of the above variables. 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 used in combination with symptom validity tests.

Computerized Test of Information Processing (CTIP). The CTIP (Tombaugh & Rees, 2000) is one of many Continuous Performance Tasks (CPTs) currently increasing in frequency of use in neuropsychological evaluations. The CTIP is purported to assess speed of information processing and reaction time. The CTIP is comprised of three subtests: Simple Reaction Time (RT), Choice RT, and Semantic Search RT. 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 specified semantic category. Because these subtests range from relatively easy to more difficult, progressively longer reaction times are expected for individuals attempting to malinger attention deficits. The primary variable of concern is the Median Reaction Time variable for each trial (Tombaugh & Rees, 2000).

The majority of research with the CTIP has been conducted within a traumatic brain injury population (e.g. Willison & Tombaugh, 2006), and the norms are based solely on patients with traumatic brain injury. However, the study by Jasinski, Harp, et al. (2011) examined the CTIP in detection of malingered ADHD and showed that several variables on the CTIP, including the simple, choice, and semantic median reaction times as well as the simple and choice reaction time coefficient 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 exhibited moderate sensitivity to malingering at 68.2% (Jasinski, Harp, et al., 2011).

Wechsler Adult Intelligence Scale-IV (WAIS-IV): Digit Span (DS), Coding (C), and Symbol Search (SS) subtests. The WAIS-IV (Wechsler, 2008) is a test system measuring general intellectual functioning, comprised of index scores in verbal comprehension, perceptual reasoning, working memory, and processing speed. The present study included the following subtests: Digit Span [DS] (forward, backward, sequencing, and Reliable Digit Span), Coding [C], and Symbol Search [SS]. The Digit Span subtest requires participants to repeat increasing strings of digits according to the given instructions. The Digit Span subtest has been studied extensively in traumatic brain injury populations, and it has demonstrated adequate sensitivity (60%), strong 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 (Jasinski, Berry, Shandera, & Clark, 2011).

The Coding and Symbol Search subtests comprise the Processing Speed Index, and they measure visual-motor coordination and speed of mental processing by asking

participants to transcribe symbols according to a given code or to determine whether a set of symbols contains a target symbol, respectively (Wechsler, 2008). These subtests were selected based on the rationale that students attempting to feign ADHD might slow their performance in order to demonstrate difficulty attending to stimuli (Marshall, et al., 2010). In Jasinski, Harp, et al. (2011), the Processing Speed Index of the WAIS-IV was selected by a statistical package as the best single predictor of feigned ADHD.

Woodcock-Johnson-III Test of Achievement (WJ-III): Reading Fluency (RF) Subtest. The Woodcock-Johnson-III Test of Achievement (Mather & Woodcock, 2001) is a system used to measure achievement in specific areas such as arithmetic, reading, and written expression. The Reading Fluency subtest requires participants to read short sentences as quickly as possible and circle "yes" or "no" to indicate the accuracy of the statements. There is a three-minute time limit on the task, and therefore, it operates as a test of both reading comprehension and processing speed. Grade-Equivalent (G-E) and Age-Equivalent (A-E) scaled scores are calculated from the total correct. Jasinski, Harp, et al. (2011) found that the A-E variable of the WJ-III Reading Fluency demonstrated moderately high sensitivity to malingered ADHD (68.2%) and good specificity to true ADHD (95%).

Post-test measures.

Post-test materials included debriefing forms for both the honest and malingering groups elaborating on the nature of the study (see Appendices M and N). A post-test questionnaire was also incorporated and required participants to reiterate their instructions and indicate how well they understood them, to what degree they were able to follow them, and the amount of effort put forth during testing (see Appendix L). The scale ranged from 1 to 5 with a response of 1 ("Not at All") indicating that the participant did not understand instructions, perceive his or herself as successful, or put forth effort,

and a response of 5 indicating the most understanding, success, effort, etc. Permission forms for data usage and contact for future research were also employed (see Appendices O and P). Finally, payment receipts were utilized for individuals in the NLM group and for individuals in the clinical group who received monetary compensation instead of research credits for their participation (see Appendices Q and R).

Procedures

The participants were primarily recruited from the psychology subject pool/mass screening session, based on their responses to the screening measure. Potential participants were then contacted by telephone by either the principal investigator or a research assistant. Phone interviews were conducted to ascertain whether or not an individual met the inclusion criteria for the study. Individuals who met the inclusion criteria for the groups were asked to participate in the study, and individuals who did not meet criteria were thanked for their time. Participants in the ADHD-H, ADHD-LD, and ADHD-ANX groups were asked to abstain from stimulant medication use for 12 hours prior to testing. Participants received a reminder email and reminder phone call approximately 24 hours before their scheduled testing time.

The nine individuals randomly assigned to the NLH group received five of their six required research credits for completion of the test battery. Participants who were randomly assigned to the NLM group were compensated with five research credits and an additional $25 dollars upon completion of the test battery. The monetary incentive was initially presented to participants as a conditional reward for successfully faking ADHD on the test measures; however, all participants in the NLM group received this compensation. Participants recruited for the ADHD-H, ADHD-LD, and ADHD-ANX

groups were also compensated with five research credits upon completion of the test battery. If clinical participants were not in need of research credits, they were compensated with $40 for their participation. No participants elected not to complete the test battery.

Testing was conducted on an individual basis and typically lasted between two and a half and three and a half hours, with few exceptions. There were two researchers present on the day of the assessment. The first researcher (RA1) conducted the pre- and post-test sessions, and the second researcher (RA2) administered the test battery in counter-balanced order. This ensured that RA2 was blind to the participant's assigned experimental condition while the test battery was being administered. At the time of the assessment, RA1 greeted the participants, obtained the informed consent, and gave a short demographic questionnaire (see Appendix G). At this time, the researcher confirmed that individuals in the ADHD-H and ADHD-CO groups did, in fact, abstain from stimulant medication use for the 12 hours prior to testing. The participants were then administered the ASRS, the BDI and the BAI to gauge current symptoms. The WRAT was also administered during the pre-test session to provide information about specific deficits in writing or reading ability. These measures were incorporated into the pre-test session to ensure that individuals responded honestly and not under feigning instructions and also to enable the researchers to evaluate between group differences.

The participants were given a brief description of the study before being presented with their instructions. RA1 explained the instructions to the participants. NLH, ADHD-H, ADHD-LD, and ADHD-ANX participants received instructions to complete the test battery honestly and give their best effort (see Appendix H). Participants assigned to the

NLM group were first provided with a handout describing a scenario where they would be externally rewarded for faking ADHD well enough to receive a diagnosis (see Appendix I). They were then given a packet of information about ADHD which included a description of the disorder and its symptoms as well as example screening questions (see Appendix J). Participants were permitted up to five minutes to study the packet. After the participants indicated that they felt adequately familiar and comfortable with the information and RA1 answered any questions about the instructions, the researcher administered an instruction check questionnaire requiring the participants to reiterate their instructions, write down a few symptoms of ADHD, and describe their strategies for faking ADHD (see Appendix K). The participants were then reminded to complete the test battery as if they were operating under the given scenario, and RA2 entered the room in place of RA1 and administer the test battery in counter-balanced order.

Given the length of the battery, participants were allowed breaks as needed. Once testing was completed, RA1 returned to the testing room while RA2 exited. RA1 then gave participants the post-test questionnaire (see Appendix L). The questionnaire asked participants to write down the instructions they were given at the beginning of the assessment and indicate the degree to which they understood the instructions, the perceived difficulty of following the role, the extent to which they felt able to respond appropriately under the given instructions, the amount of effort they exerted for the test battery, and the extent to which the monetary compensation was motivating to fake well. Finally, participants were debriefed about the purpose of the study and the deception concerning the monetary incentive. Participants were compensated accordingly for their time, instructed not to discuss the study with others, and thanked for their participation.

Chapter 3: Results

Sample Description

Demographic data.

A total of 88 participants, 74 from the University of Kentucky PSY 100 subject pool and 14 recruited by flier, entered the study. Data from twelve participants were excluded from analysis for various reasons, as detailed next. Two individuals were dropped because they endorsed reasons for exclusion on their demographics questionnaires which were not given during the telephone screening: a diagnosis of Central Auditory Processing Disorder and a history of head injury, respectively. Four additional participants were not included because they endorsed a history of depression. Three individuals were removed because they were outliers on either the age or WRAT Word Reading standard score variable. One individual was excluded because he could not maintain wakefulness during the testing, and another individual's data were dropped because the testing session was terminated due to inclement weather. Finally, one individual was excluded because he indicated on the post-test questionnaire that he did not give adequate effort in following instructions. The effort question on the post-test questionnaire was phrased "How hard did you try?" and the scale ranged from 1 "Not at All" to 5 "Your Hardest" (see Appendix L). Any response below 4 was considered inadequate effort and the participant was dropped from final analysis. Overall, six participants from the NLM group, five participants from the ADHD-H group, and one participant from the NLH group were excluded from analyses, resulting in the following sample sizes: NLH n=9, NLM n=23, ADHD-H n=22, and ADHD-CO n=22. Of the original participants, 76 produced data that were considered valid for analysis.

In the final sample, 44 participants had been diagnosed with ADHD, and 32 had not been. The overall sample was 45.7% male. On average, the sample participants were 19.5 years old (*SD* = 1.44) and had completed 12.9 years of education (*SD* = 1.10). Only 3.4% of individuals had repeated a grade, and participants had an average Wide Range Achievement Test (WRAT-IV) Word Reading subtest standard score of 100.8 (*SD* = 11.49). The sample was 93.9% right-handed, and the racial/ethnic makeup of the sample was overwhelmingly White (96.7%), with slight representation of other ethnicities (2.2% Black and <1% Hispanic). Table 3.1 presents the demographic makeup of the sample by assigned group. There were no statistically significant differences between groups on these variables.

Diagnostic data.

Participants with ADHD received their diagnoses at an average age of 11.6 years (*SD* = 3.81). ADHD subtype was unspecified for 40.9% of the participants. Of the remaining participants, 34.1% were diagnosed with ADHD-Combined subtype, 15.9% were diagnosed with ADHD-Predominantly Inattentive subtype, and 9.1% were diagnosed with ADHD-Predominantly Hyperactive subtype. Approximately 15.9% of participants with ADHD could not recall which type of diagnostic professional gave them their diagnoses. Of the remaining individuals with ADHD, 43.2% reported that they received their diagnosis from a psychologist, 31.8% reported that they received their diagnosis from a psychiatrist, and 9.1% reported that they received their diagnosis from a family physician. There was a significant difference between the two clinical groups on type of diagnostic professional ($\chi^2 = 4.12$, $p = .043$), such that significantly more individuals in the ADHD-H group received their diagnoses from family physicians than

did the individuals in the ADHD-CO group. Of the individuals with ADHD, only 18.2% were not currently being medicated. Overall, 45.5% of participants with ADHD were prescribed an amphetamine drug (29.6% Adderall and 15.9% Vyvanse), 18.2% were prescribed a stimulant in the methylphenidate family (13.6% Concerta, 4.6% Focalin, 0.0% Ritalin), 2.3% were prescribed the non-stimulant Strattera, 9.1% of participants reported being treated with a combination of the above medications, and 6.8% of participants reported that they were treated with a medication other than those listed above. Nearly half of all participants with ADHD were receiving accommodations from the university (43.2%), and significantly more individuals in the ADHD-CO group were receiving accommodations than in the ADHD-H group ($\chi^2 = 5.40$, $p = .020$). Of the participants with ADHD-CO, 59.1% of participants reported a history of diagnosed anxiety disorder, and 40.1% of participants reported a history of diagnosed learning disorder. No individuals in the ADHD-H group endorsed a history of comorbid anxiety or learning disorder, and this resulted in a statistically significant difference on diagnosis of anxiety ($\chi^2 = 18.03$, $p = .000$) and diagnosis of learning disorder ($\chi^2 = 11.06$, $p = .000$). Table 3.2 presents the ADHD-related diagnostic characteristics of participants with ADHD and those with a comorbid diagnosis. Participants in the ADHD-CO group differed significantly from the ADHD-H group on type of diagnostic professional, whether or not they were receiving accommodations, and their comorbid diagnoses of anxiety or learning disorder.

The Adult ADHD Self-Report Scale (ASRS) Parts A and B, screening measures for ADHD symptomatology, were given under standard instructions prior to experimental manipulation. These variables exhibited some skewness, kurtosis, and heterogeneity in

variance, and therefore, non-parametric Kruskal-Wallis statistics were used. Main effects were found for ADHD diagnosis on the ASRS measures, with diagnosed participants endorsing higher levels of ADHD symptoms than the nonclinical participants on both ASRS Part A ($K = 29.92$, $p = .000$) and ASRS Part B ($K = 37.96$, $p = .000$). Participants with a diagnosis of ADHD were compared to those with no diagnosis of ADHD. On Part A of the ASRS, NLH participants had an average raw score of 8.90 ($SD = 3.91$), and NLM participants averaged 9.69 ($SD = 3.41$). The clinical groups average much higher raw scores with a mean of 14.52 ($SD = 2.83$) for the ADHD-H group and 14.77 ($SD = 2.99$) for the ADHD-CO group. Similar distributions were apparent on the ASRS B, with the following means and standard deviations by group: NLH ($M = 14.70$, $SD = 7.20$), NLM ($M = 15.62$, $SD = 5.55$), ADHD-H ($M = 26.48$, $SD = 7.68$), and ADHD-CO ($M = 28.64$, $SD = 5.44$). These findings support the diagnostic integrity and credibility of the experimental groups.

Group Differences on Test Measures

Self-Reported ADHD Symptoms.

The 76 participants completed the Barkley Adult ADHD Rating Scale (BAARS-IV) under instruction (i.e. either honest or malingering instruction) to provide information about how individuals assigned to feign ADHD tend to self-report ADHD symptoms. The Inattention, Hyperactivity, Impulsivity, Total ADHD, and Sluggish Cognitive Tempo raw score indices and associated Symptom Counts discussed previously were examined, and Table 3.3 presents the group results on these variables.

Kruskal-Wallis non-parametric analyses revealed statistically significant ($p < .01$) differences on each of the nine variables from the BAARS-IV. Follow-up Mann-Whitney

U contrasts demonstrated that the NLM group endorsed statistically significantly higher rates of ADHD symptoms than the NLH group on all nine variables. The NLM group also self-reported statistically significantly higher scores on the Hyperactivity index than both of the clinical groups: ADHD-H and ADHD-CO. There were no significant differences between the NLM group and either clinical group on the remaining eight variables. These findings suggest that the individuals assigned to malinger were able to successfully "fake" ADHD on a self-report scale, increasing their self-report of ADHD symptoms significantly in proportion to nonclinical individuals responding under honest instructions.

A further manipulation check was conducted, comparing the NLH and NLM groups on several variables which were administered under experimental manipulation. As previously discussed, the NLM group endorsed statistically significantly more ADHD symptoms across all domains of the BAARS-IV than did the NLH group (see Table 3.3). Additionally, the NLM group performed statistically significantly ($p < .01$) worse than the NLH group on six of the seven variables from dedicated effort tests which were examined. The exception was a statistically non-significant difference between the two groups on the b Test E-Score variable. The results of these comparisons are presented in Table 3.4.

Effort Test Performance.

As noted earlier, participants completed a number of tests under instruction, including some embedded processing speed indices from achievement and intelligence measures in addition to the dedicated effort tests. Though dedicated Symptom Validity Tests (SVTs) are very useful for detecting malingering in clinical settings, research is

being directed at developing or establishing useful embedded measures for which a malingered performance is typically more difficult to coach.

Though a few tests were normally distributed, many measures violated the assumptions of normality; therefore, only non-parametric results are presented to preserve comparability of reported statistics. Performance on these measures was analyzed with a series of omnibus tests using Kruskal-Wallis one-way ANOVA. Table 3.5 presents the test data by group as well as the results of these omnibus tests.

Statistically significant group differences were found on all measures, with the exception of the WAIS-IV Reliable Digit Span (RDS) variable. For each variable that exhibited omnibus group differences, non-parametric follow-up contrasts were performed using the Mann-Whitney *U* test. Table 3.6 displays the detailed results of these contrasts, with statistical significance held at $p<.01$ to reduce the chance of Type I error.

In line with hypotheses, statistically significant differences were found between nonclinical malingerers and clinical controls with ADHD on the majority of effort measures. The NLM group exhibited significantly decreased performances on all measures compared to the ADHD-H group. Similarly, the NLM group performed worse than the ADHD-CO group on most measures. Exceptions to this include comparable performances of the NLM and ADHD-CO groups on the b Test E-Score, the WAIS-IV Processing Speed Index (PSI), and the WJ-III Reading Fluency Age-Equivalent (WJ-III RF A-E) scale score variables. The ADHD-H and ADHD-CO groups only differed statistically significantly on the WJ-III RF A-E scale score, with the ADHD-CO group achieving lower scores. This finding suggests that the ADHD-CO group's WJ-III Reading Fluency performance may have been adversely affected by their comorbid

diagnoses. The average significant effect size was quite large for both NLM vs. ADHD-H ($|d|$ = 1.17) and NLM vs. ADHD-CO ($|d|$ = 0.99).

Effort Test Utility Indicators

Test operating characteristics for each effort measure were evaluated by determining sensitivity and specificity at a given cutting score. The majority of the effort measures examined in this study have established cut scores for use in clinical populations. Therefore, the utility of these measures in distinguishing individuals who are malingering from those who are giving good effort must be examined in light of the specified cut scores. Table 3.7 lists the established cut scores for these measures as well as SN, SP, and HR for each. Published cut scores were not available for the CTIP CRT Med RT, WAIS-IV PSI, and WJ-III RF A-E variables, and therefore, the high specificity optimal cut scores derived in Jasinski, Harp, et al. (2011) were used for the purpose of comparison and are noted in Table 3.7.

The cut scores for the majority of measures demonstrated fair to moderate sensitivity (SN ≥.40 and ≤ .70) to malingering instruction, including the TOMM Overall, NV-MSVT variables, CTIP Median Reaction Time for all conditions, WAIS-IV PSI, and WJ-III RF A-E. Sensitivity was lower (< .40) for trials one and two of the TOMM, the LMT, and the b Test E-Score. Sensitivity of the DMT was quite poor (SN < .20).

The cut scores demonstrated very high specificity for clinical participants under honest instructions, with somewhat higher specificity rates for ADHD-H than ADHD-CO (mean change in SP = .043). Exceptions for ADHD-H included the CTIP SCRT Med RT and the WAIS-IV PSI for which specificity was moderate (SP > .70). Exceptions for ADHD-CO included the b Test E-Score and the CTIP SCRT Med RT, for which

specificity was still quite good (SP > .80) and the WAIS-IV PSI and WJ-III RF A-E for which specificity was more modest (SP > .50), as presented in Table 3.8.

The hit rates for classifying malingering (NLM) were computed at a 50% base rate. The hit rates for the TOMM Overall variable and all variables of the CTIP were moderate (HR[50] > .70) and fair (HR [50] > .60) for trials one and two of the TOMM, LMT, b Test E-Score, NV-MSVT variables, WAIS-IV PSI, and WJ-III RF A-E. The DMT performed poorly (HR[50] ≤ .60).

Positive and negative predictive power (PPP and NPP) provide information about the ability of a test to predict whether an individual has a specified condition. In other words, these values express how well failure (scoring below or above the identified cut score) on a test predicts presence or absence of the condition: in this case, instruction to malinger. These values were calculated at base rates of 50% and 25% to determine classification accuracy for NLM at varying prevalence estimates for the general population. Table 3.8 displays PPP and NPP values for the various measures at the established cut scores.

PPP was generally higher than NPP at a base rate of 50%, and many of the measures demonstrated excellent PPP (> .90) for malingering, including the TOMM variables, DMT, LMT, and CTIP SRT Med RT. PPP for the NV-MSVT variables and the CTIP CRT Med RT was also quite high (> .80), and the remaining variables demonstrated moderate PPP (.PPP ≥ .60 and ≤ .80). NPP at this base rate was more modest with the CTIP CRT Med RT performing the best with NPP > .70. All other variables exhibited modest to moderate NPP (NPP ≥.50 and ≤ .70).

As expected, PPP values were somewhat lower than NPP values at a base rate of

25%. The TOMM variables, LMT, DMT, and CTIP SRT Med RT continued to display excellent PPP (1.00), and PPP for Criterion A1 of the NV-MSVT and the CTIP CRT Med RT remained in the moderately high range (PPP > .70). However, PPP for most of the remaining variables was reduced to the modest to moderate range (>.50 and <.70), and PPP for the WAIS-IV PSI and the WJ-III RF A-E variables was below chance levels. NPP at the 25% base rate was generally higher than PPP and much better than NPP at a 50% base rate, with all NPP values greater than .70.

Utility of Effort Tests Used in Combination

Ideally, clinicians should use more than one effort test during clinical evaluations to reduce the chance of false positives, and they should only classify as malingering those individuals who demonstrate inadequate effort on multiple measures. Using embedded indices in addition to dedicated effort tests is often preferred since the embedded measures tend to be less transparent. Therefore, sensitivity, specificity, and hit rate were calculated by overall number of tests failed – collapsed across dedicated and embedded indices – where failure is defined by the identified cut scores, and these values are listed in Table 3.9. When only one failed test was required to be classified as malingering, sensitivity to NLM was excellent (SN = .913), specificity was modest to moderate (SP = .591) for ADHD-H and modest for ADHD-CO (SP = .409). Requiring two or more positive test signs for malingering classification resulted in moderately high sensitivity to NLM (SN = .696), and very high to moderate specificity for ADHD-H and ADHD-CO, respectively (SP = .955 and SP = .773). Specificity to ADHD-H is perfect (SP = 1.00) when three or more positive test signs are required, but five or more positive test signs are required to achieve perfect specificity for ADHD-CO. The maximal overall hit rate

for classifying malingering (HR[50] = .773) was obtained when failure on at least two tests was required.

This analysis was conducted a second time, taking into consideration only dedicated effort tests, which generally have stronger classification properties. In other words, the intelligence and achievement measures (WAIS-IV and WJ-III) were not included. The results of this second analysis are reported in Table 3.10. Classifying those who failed one or more tests as malingering resulted in high sensitivity to malingering (SN = .870), as well as high specificity for ADHD-H (SP = .909) and ADHD-CO (SP = .864). This criterion also achieved the highest maximal hit rate for classifying malingering (HR[50] = .761). Perfect specificity for ADHD-H and ADHD-CO was achieved at a cut score of two or more tests for the former and three or more tests for the latter. These results raise the possibility of decreased specificity for ADHD with a comorbid disorder diagnosis.

To identify the most powerful combination of effort tests, a binomial logistic regression was performed ($N = 76$), where test performance was utilized to predict honest vs. malingering instruction. The variables included the TOMM Overall, LMT, DMT, b Test E-Score, NV-MSVT Overall, WAIS-IV PSI, and WJ-III A-E, and the tests selected as predictors in the regression model were determined by a forward conditional stepwise method. The results of the analysis are displayed in Table 3.11. The TOMM Overall variable was selected for Step 1 of the stepwise regression as the best single predictor. In the second step, the TOMM Overall variable was added to the LMT, resulting in significant change in the likelihood ratio (Δ-*2LL*), or in other words, significant improvement in overall model fit. The NV-MSVT Overall variable was added in the third

step, resulting in further incremental power. However, the NV-MSVT did not improve the overall classification accuracy, though it may be more robust in a larger sample. The addition of other tests did not significantly improve the model fit, and therefore, only three steps were entered.

Additional Analyses

Nonparametric follow-up analyses were performed to explore potential differences between the two original comorbid groups – ADHD-LD (n = 9) and ADHD-ANX (n = 13) – on neurocognitive feigning measures. These analyses revealed no statistically significant differences between the two subgroups on the aforementioned variables. However, the analyses were likely underpowered due to the small sample sizes in these groups.

Additional nonparametric analyses were conducted to compare the participants in the ADHD-H group who received their diagnoses prior to age 13 to those individuals who received their diagnoses at or after the age of 13. The purpose of these analyses was to reveal possible differences between individuals who received the diagnosis of ADHD at a younger age and individuals who were older at the time of diagnoses. However, there were no statistically significant differences between the two subsamples on the test variables.

Table 3.1

Demographic Characteristics of Participants Included in Final Analyses

		Group Descriptives				Omnibus Test	
		NLH *n* = 9	NLM *n* = 23	ADHD-H *n* = 22	ADHD-CO *n* = 22	*F* or $\chi^{2\backslash}$ *N* = 76	*P*
Male	%	44.44	56.52	50.00	31.82	2.96	.398
Age	*M*	19.44	20.04	19.05	19.50	1.89	.193
	SD	1.59	1.33	1.29	1.54		
Education Yr.	*M*	12.67	13.26	12.73	13.09	1.16	.332
	SD	1.00	0.92	1.12	1.34		
Repeat Grade	%	0.00	4.35	0.00	9.09	2.82	.420
WRAT:	*M*	99.44	106.04	98.55	99.32	2.19	.097
WR St.S	*SD*	16.08	8.21	8.18	13.47		
Right-handed	%	88.89	95.65	95.45	95.45	0.70	.873
Ethnicity						7.20	.303
White	%	100.00	86.96	100.00	100.00		
Black	%	0.00	8.70	0.00	0.00		
Hispanic	%	0.00	4.35	0.00	0.00		
Other	%	0.00	0.00	0.00	0.00		

Note. NLH = Normal Honest; NLM = Normal Malingering; ADHD-H = ADHD Honest; ADHD-CO = Comorbid ADHD; *M* = Mean; *SD* = Standard Deviation; WRAT: WR St.S = Wide Range Achievement Test-IV (WRAT-IV) Word Reading Standard Score.

Table 3.2

ADHD Diagnostic Characteristics of Participants in Final Analyses

		Group Descriptives		Omnibus Test	
		ADHD-H	ADHD-CO	*t* or χ^2	
		n = 22	*n* = 22	*n* = 44	*P*
Dx. Age	*M*	11.59	11.55	.040	.969
	SD	3.67	3.95	-	-
ADHD Type				2.07	.150
Inattentive	%	9.10	22.70	-	-
Hyperactive	%	4.50	13.60	-	-
Combined	%	31.80	36.40	-	-
Unspecified	%	54.50	27.20	-	-
Dx. Prof.				4.12	.043*
Psychologist	%	31.80	54.50	-	-
Psychiatrist	%	22.70	40.90	-	-
Fam. Phys.	%	18.20	0.00	-	-
Unspecified	%	27.20	4.50	-	-
ADHD Med				.028	.867
Adderall	%	31.80	27.30	-	-
Vyvanse	%	9.10	22.70	-	-
Concerta	%	13.60	13.60	-	-
Focalin	%	9.10	0.00	-	-
Ritalin	%	0.00	0.00	-	-
Strattera	%	0.00	4.50	-	-
Combination	%	9.10	9.10	-	-
Other	%	9.00	4.50	-	-
None	%	18.20	18.20	-	-
Accommodations	%	27.3	59.10	5.40	.020*
Comorbid Dx.					
Anxiety	%	0.00	59.10	18.03	.000**
Learning Disorder	%	0.00	40.90	11.06	.001**

Note. ADHD-H = ADHD Honest; ADHD-CO = Comorbid ADHD; *M* = Mean, *SD* = Standard Deviation; Dx. Age= age of ADHD diagnosis; Dx. Prof.= type of diagnostic professional; Fam. Phys.= Family Physician; Comorbid Dx. = Presence of second diagnosis.
* = significant at $p < .05$ level. ** = significant at $p < .001$ level.

Table 3.3

BAARS-IV: Mean Group Differences

	Group Descriptives				Omnibus Test ($N = 76$)	
	NLH $n = 9$	NLM $n = 23$	ADHD-H $n = 22$	ADHD-CO $n = 22$		
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*K*	*P*
Inatt. Raw	14.11 (4.28) [a]	23.39 (4.74) [b]	21.50 (4.73) [b]	21.19 (6.23) [b]	19.13	.000**
Hyp. Raw	7.44 (2.40) [a]	13.78 (2.75) [b]	11.05 (3.54) [c]	11.71 (2.47) [bc]	21.90	.000**
Imp. Raw	5.67 (1.94) [a]	10.48 (2.31) [b]	10.00 (3.92) [b]	9.29 (3.15) [b]	15.03	.002*
ADHD Raw	27.22 (7.68) [a]	46.04 (12.79) [b]	42.55 (9.51) [b]	42.19 (9.91) [b]	18.02	.000**
SCT Raw	16.22 (4.27) [a]	21.87 (3.58) [b]	21.95 (4.48) [b]	23.90 (6.69) [b]	11.68	.009*
Inatt. S.C.	0.67 (1.32) [a]	5.30 (2.30) [b]	3.77 (2.45) [b]	3.57 (2.91) [b]	20.37	.000**
Hyp./Imp. S.C.	0.89 (1.36) [a]	5.17 (2.23) [b]	3.86 (2.80) [b]	3.67 (2.11) [b]	18.15	.000**
ADHD S.C.	1.44 (2.55) [a]	10.48 (4.28) [b]	7.64 (4.18) [b]	7.24 (4.27) [b]	21.88	.000**
SCT S.C.	1.00 (2.29) [a]	4.22 (1.81) [b]	4.23 (1.82) [b]	4.76 (2.88) [b]	13.25	.004*

Note. These values reflect the performance of participants under experimental manipulation. BAARS-IV = Barkley Adult ADHD Rating Scale-IV; NLH = Normal Honest; NLM = Normal Malingering; ADHD-H = ADHD Honest; ADHD-CO = Comorbid ADHD; *K* = Kruskal-Wallis Chi-Square value; *M* = Mean; *SD* = Standard Deviation; Inatt. Raw = Inattention Raw Score; Hyp. Raw = Hyperactivity Raw Score; Imp. Raw = Impulsivity Raw Score; ADHD Raw = Total ADHD Raw Score; SCT Raw = Sluggish Cognitive Tempo Raw Score; Inatt. S.C. = Inattention Symptom Count; Hyp./Imp. S.C. = Hyperactivity/Impulsivity Symptom Count; ADHD S.C. = Total ADHD Symptom Count; SCT S.C. = Sluggish Cognitive Tempo Symptom Count.
[abc] Within each row, columns with different letters are statistically significantly ($p < .01$) different from each other using Mann-Whitney U follow up contrasts.
* = significant at $p < .01$ level. ** = significant at $p < .001$ level.

Table 3.4

Manipulation Check: NLM vs. NLH Neurocognitive Test Performance on Dedicated Effort Tests

	Group Descriptives			
	NLH *n* = 9 *M* (*SD*)	NLM *n* = 23 *M* (*SD*)	*K* *n* = 32	*P*
TOMM				
T2 % Correct	100.00 (0.00)	89.48 (11.76)	11.48	.001*
Ret % Correct	99.56 (0.88)	88.96 (11.33)	11.35	.001*
DMT %	100.00 (0.00)	95.28 (6.83)	8.52	.004*
LMT %	100.00 (0.00)	93.05 (8.04)	9.42	.002*
b test				
E-Score	144.12 (179.29)	180.03 (179.27)	0.79	.373
NV-MSVT				
Criterion A1	97.96 (2.67)	90.18 (6.70)	10.62	.001*
Criterion A2	96.94 (4.01)	85.65 (9.45)	10.61	.001*

Note. These values reflect the performance of participants under experimental manipulation. NLH = Normal Honest; NLM = Normal Malingering; *M* = Mean; *SD* = Standard Deviation; TOMM = Test of Memory Malingering; T2 % Correct =Trial 2 percent correct; Ret % Correct = Retention Trial percent correct; DMT % = Digit Memory Test Total percent correct; LMT % = Letter Memory Test Total percent correct; NV-MSVT = Non-Verbal Medical Symptom Validity Test.
* = significant at $p < .01$ level.

Table 3.5

Neurocognitive Feigning Test Results by Group on Dedicated and Embedded Effort Tests

	Group Descriptives			Omnibus Test (*N*=67)	
	NLM	ADHD-H	ADHD-CO		
	n=23	*n*=22	*n*=22		
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*K*	*P*
TOMM					
T1 % Correct	80.17 (12.04)	94.55 (8.38)	92.27 (7.81)	20.81	.000**
T2 % Correct	89.48 (11.76)	99.64 (1.00)	99.82 (0.85)	32.02	.000**
Ret % Correct	88.96 (11.33)	99.45 (1.41)	99.36 (0.95)	30.31	.000**
DMT %	95.28 (6.83)	99.37 (1.90)	99.50 (1.85)	18.82	.000**
LMT %	93.05 (8.04)	98.89 (1.78)	99.30 (1.43)	13.14	.001*
b test					
E-Score	180.03 (179.27)	45.06 (17.98)	84.22 (107.00)	12.53	.002*
NV-MSVT					
Criterion A1	90.18 (6.70)	96.82 (3.20)	96.82 (3.26)	17.10	.000**
Criterion A2	85.65 (9.45)	95.23 (4.80)	95.51 (4.72)	17.92	.000**
CTIP					
SRT Med RT	0.50 (0.22)	0.30 (0.04)	0.32 (0.05)	17.39	.000**
CRT Med RT	0.90 (0.28)	0.56 (0.14)	0.60 (0.13)	25.10	.000**
SCRT Med RT	7.36 (28.92)	0.83 (0.25)	0.90 (0.22)	20.16	.000**
WAIS-IV					
RDS	8.87 (1.42)	9.32 (1.62)	9.27 (1.58)	1.05	.593
PSI	91.00 (15.48)	106.82 (16.37)	98.23(9.45)	11.09	.004*
WJ III RF					
A-E	15.25 (4.53)	20.42 (3.28)	17.17 (3.84)	14.83	.001*

Note. These values reflect the performance of participants under experimental manipulation. Kruskal-Wallis non-parametric test (df = 2) was used due to violations of the assumptions of normality. NLM = Normal Malingering; ADHD-H = ADHD Honest; ADHD-CO = Comorbid ADHD. *K* = Kruskal-Wallis Chi-Square value; *M* = Mean; *SD* = Standard Deviation; TOMM = Test of Memory Malingering; T1 % Correct = Trial 1 percent correct; T2 % Correct =Trial 2 percent correct; Ret % Correct = Retention Trial percent correct; DMT % = Digit Memory Test Total percent correct; LMT % = Letter Memory Test Total percent correct; NV-MSVT = Non-Verbal Medical Symptom

Table 3.5 (continued)

Validity Test; CTIP = Computerized Test of Information Processing; SRT Med RT = Simple Reaction Time median reaction time; CRT Med RT = Choice Reaction Time median reaction time; SCRT Med RT = Semantic Choice Reaction Time median reaction time; WAIS-IV = Wechsler Adult Intelligence Scale – Fourth Edition; RDS = Reliable Digit Span; PSI = Processing Speed Index; WJ III RF= Woodcock-Johnson III Tests of Achievement Reading Fluency; A-E = Age-Equivalent Scale Score.
* = significant at $p < .01$ level. ** = significant at $p < .001$ level.

Table 3.6

Mann-Whitney U tests for Individual Contrasts on Dedicated and Embedded Effort Tests

	NLM vs. ADHD-H			NLM vs. ADHD-CO			ADHD-H vs. ADHD-CO		
	U	*p*	*d*	*U*	*p*	*d*	*U*	*p*	*D*
TOMM									
T1 % Correct	79.00	.000**	-1.41	96.50	.000**	-1.21	172.00	.095	0.29
T2 % Correct	82.00	.000**	-1.23	73.00	.000**	-1.25	221.00	.323	-0.20
Ret % Correct	61.00	.000**	-1.31	68.50	.000**	-1.31	212.50	.358	0.08
DMT %	127.00	.001*	-0.83	118.50	.000**	-0.85	231.50	.655	-0.07
LMT %	143.00	.008*	-1.02	122.50	.001**	-1.10	209.50	.344	-0.26
b test									
E-Score	92.00	.000**	1.07	148.00	.044	0.66	172.00	.152	-0.52
NV-MSVT									
Criterion A1	96.00	.000**	-1.28	98.00	.000**	-1.28	239.00	.943	0.00
Criterion A2	96.00	.000**	-1.30	91.00	.000**	-1.34	234.00	.850	-0.06
CTIP									
SRT Med RT	88.50	.000**	1.28	104.00	.001*	1.14	221.00	.621	-0.45
CRT Med RT	60.00	.000**	1.82	73.50	.000**	1.40	188.00	.204	-0.30
SCRT Med RT	74.00	.000**	0.32	98.50	.000**	0.32	198.00	.301	-.030
WAIS-IV									
PSI	118.00	.002*	-1.02	170.00	.059	-0.57	161.00	.056	0.66
WJ III RF									
A-E	96.5	.000**	-1.33	181.50	.104	-0.47	133.50	.009*	0.93

Note. Mann-Whitney non-parametric test was used due to violations of the assumptions of t-test. NLM = Normal Malingering; ADHD-H = ADHD Honest; ADHD-CO = Comorbid ADHD; *U* = Mann-Whitney *U* value; *M* = Mean; *SD* = Standard Deviation; TOMM = Test of Memory Malingering; T1 % Correct = Trial 1 percent correct; T2 % Correct = Trial 2 percent correct; Ret % Correct = Retention Trial percent correct; DMT % = Digit Memory Test Total percent correct; LMT % = Letter Memory Test Total percent correct; NV-MSVT = Non-Verbal Medical Symptom Validity Test; CTIP = Computerized Test of Information Processing; SRT Med RT = Simple Reaction Time median reaction time; CRT Med RT = Choice Reaction Time median reaction time; SCRT Med RT = Semantic Choice Reaction Time median reaction time; WAIS-IV = Wechsler Adult Intelligence Scale – Fourth Edition; PSI = Processing Speed Index; WJ III RF= Woodcock-Johnson III Tests of Achievement Reading Fluency; A-E = Age-Equivalent Scale Score.
* = significant at $p < .01$ level; ** = significant at $p < .001$ level.

Table 3.7

Effort Test Operating Characteristics for Dedicated and Embedded Effort Tests

	SN to NLM	SP for ADHD-H	SP for ADHD-CO	NLM HR(50)
TOMM				
T2 %	.391	1.00	1.00	.696
Ret %	.391	1.00	1.00	.696
TOMM Overall	.522	1.00	1.00	.761
DMT (%TOT < 90)	.174	1.00	1.00	.587
LMT % (%TOT < 93)	.391	1.00	1.00	.696
b test (E-Score ≥ 120)	.364	1.00	.857	.635
NV-MSVT				
Criterion A1 (≤ 90)	.435	.955	.955	.689
Criterion A2 (< 88)	.478	.909	.909	.692
NV-MSVT Overall	.478	.909	.909	.692
CTIP				
SRT Med RT (≥ .50)	.435	1.00	1.00	.718
CRT Med RT (> .77) [a]	.609	.910	.909	.767
SCRT Med RT (≥ 1.05)	.609	.727	.818	.710
WAIS-IV				
PSI (< 97) [a]	.652	.727	.591	.666
WJ III RF				
A-E (< 16) [a]	.478	.909	.500	.617

Note. SN = Sensitivity; SP = Specificity; HR = Overall Hit Rate based on estimated BR = .50; NLM = Normal Malingering; ADHD-H = ADHD Honest; ADHD-CO = Comorbid ADHD; 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 %TOT = Digit Memory Test Total percent correct; LMT %TOT = Letter Memory Test Total percent correct; NV-MSVT = Non-Verbal Medical Symptom Validity Test; NV-MSVT Overall = failure on either or both Criterion A1 and Criterion A2; CTIP = Computerized Test of Information Processing; SRT Med RT = Simple Reaction Time median reaction time; CRT Med RT = Choice Reaction Time median reaction time;

Table 3.7 (continued)

SCRT Med RT = Semantic Choice Reaction Time median reaction time; WAIS-IV = Wechsler Adult Intelligence Scale – Fourth Edition; PSI = Processing Speed Index; WJ III RF= Woodcock-Johnson III Tests of Achievement Reading Fluency; A-E = Age-Equivalent Scale Score.

[a] = cut score derived from Jasinski, Harp, et al. (2011) high specificity optimal cut scores.

Table 3.8

Positive and Negative Predictive Power of Dedicated and Embedded Effort Tests

	NLM			
	BR = .50		BR = .25	
	PPP	NPP	PPP	NPP
TOMM				
T2 %	1.00	.622	1.00	.831
Ret %	1.00	.622	1.00	.831
TOMM Overall	1.00	.676	1.00	.863
DMT (%TOT < 90)	1.00	.547	1.00	.784
LMT % (%TOT < 93)	1.00	.622	1.00	.831
b test (E-Score ≥ 120)	.793	.587	.561	.815
NV-MSVT				
Criterion A1 (≤ 90)	.884	.625	.718	.834
Criterion A2 (< 88)	.834	.634	.626	.839
NV-MSVT Overall	.834	.634	.626	.839
CTIP				
SRT Med RT (≥ .50)	1.00	.639	1.00	.842
CRT Med RT (> .77) [a]	.890	.703	.730	.877
SCRT Med RT (≥ 1.05)	.763	.675	.518	.862
WAIS-IV				
PSI (< 97) [a]	.706	.661	.404	.854
WJ III RF				
A-E (< 16) [a]	.661	.591	.394	.813

Note. BR = Base rate of malingering; PPP = Positive Predictive Power; NPP = Negative Predictive Power; NLM = Normal Malinger; 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 %TOT = Digit Memory Test Total percent correct; LMT %TOT = Letter Memory Test Total percent correct; NV-MSVT = Non-Verbal Medical Symptom Validity Test; NV-MSVT Overall = failure on either or both Criterion A1 and Criterion A2; CTIP = Computerized Test of Information Processing; SRT Med RT = Simple Reaction Time median reaction time; CRT Med RT = Choice Reaction Time

Table 3.8 (continued)

median reaction time; SCRT Med RT = Semantic Choice Reaction Time median reaction time; WAIS-IV = Wechsler Adult Intelligence Scale – Fourth Edition; PSI = Processing Speed Index.
[a] = cut score derived from Jasinski, Harp, et al. (2011) high specificity optimal cut scores.

Table 3.9

Utility Indicators for Failure of Multiple Dedicated and Embedded Effort Tests

# Tests Positive	SN to NLM	SP for ADHD-H	SP for ADHD-CO	NLM HR(50)
1	.913	.591	.409	.721
2	.696	.955	.773	.773
3	.565	1.00	.909	.754
4	.435	1.00	.955	.708
5	.304	1.00	1.00	.652
6	.261	1.00	1.00	.631
7	.130	1.00	1.00	.565

Note. Measures included TOMM Overall, LMT total percent correct, DMT total percent correct, NV-MSVT Overall, WAIS-IV PSI, b Test E-Score, and WJ III RF Age-Equivalent Scale Score. # Tests Positive = 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 et al. (2011). SN = Sensitivity; SP = Specificity; HR(50) = Overall Hit Rate based on estimated BR = .50; NLM = Normal Malingering; ADHD = ADHD Honest; ADHD-CO = Comorbid ADHD.

Table 3.10

Utility Indicators for Failure of Multiple Dedicated Effort Tests

# Tests Positive	SN to NLM	SP for ADHD-H	SP for ADHD-CO	NLM HR(50)
1	.870	.909	.864	.761
2	.478	1.00	.909	.696
3	.348	1.00	1.00	.674
4	.174	1.00	1.00	.587
5	.130	1.00	1.00	.565

Note. Measures included TOMM Overall, LMT total percent correct, DMT total percent correct, NV-MSVT Overall, b Test E-Score. # Tests Positive = 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). SN = Sensitivity; SP = Specificity; HR(50) = Overall Hit Rate based on estimated BR = .50; NLM = Normal Malingering; ADHD = ADHD Honest; ADHD-CO = Comorbid ADHD.

Table 3.11

Binomial Logistic Regression Models of Incremental Validity

Step		*-2LL*	R^2	% Class.	*Δ-2LL*	*P*
1	**TOMM Overall**	58.73	.516	85.5	42.26	.000**
2	**LMT % Correct**				12.19	.000**
	TOMM Overall	47.41	.640	89.5	24.38	.000**
3	**LMT % Correct**				11.88	.001*
	TOMM Overall				23.76	.000**
	NV_MSVT Overall	40.57	.707	89.5	7.32	.007*

Note. Forward Stepwise Conditional Logistic Regression was used due to the exploratory nature of the data. *-2LL* = -2 log likelihood; R^2 = Nagelkerke R squared; % Class. = % of sample correctly classified; *Δ-2LL* = Change in -2 log likelihood; TOMM Overall = Test of Memory Malingering, Failure on either or both TOMM Trial 2 and TOMM Retention Trial; LMT % Correct = Letter Memory Test, Total Percent Correct; NV-MSVT Overall = Nonverbal Medical Symptom Validity Test, Failure on either or both Criterion A1 and Criterion A2.
* = significant at $p < .01$ level. ** = significant at $p < .001$ level.

Chapter 4: Discussion

Overview of Findings

The growing prevalence of malingered ADHD on college campuses demonstrates the importance of identifying effective instruments to use in ADHD evaluations to prevent misdiagnosis. Most of the research in this area has been conducted within the last decade, and the trends indicate that many of the dedicated effort tests which have been validated for use in traumatic brain injury populations are also effective in the context of ADHD. Additionally, research is exploring the possibility of using embedded indices in various frequently administered tests, in hopes that these may demonstrate high classification accuracy for malingering while avoiding the extra time for effort test administration. The present study sought to cross-validate the findings of Jasinski, Harp, et al. (2011), which consistent with earlier studies (e.g. Sollman, Ranseen, & Berry, 2010) indicated that a wide array of measures, ranging from well-established SVTs to less researched embedded processing speed indices, are useful in the detection of malingered ADHD.

As expected, the Barkley Adult ADHD Rating Scale (BAARS-IV) was able to differentiate clinical participants from nonclinical honest participants, with clinical participants endorsing significantly more ADHD symptomatology. The malingering participants also endorsed significantly more ADHD symptomatology than the nonclinical honest participants, but contrary to the hypothesis, malingerers did not score higher than clinical participants on the majority of BAARS-IV indices. The one exception is that the malingerers did endorse significantly more hyperactivity symptoms

than the ADHD only control group but not significantly more than the comorbid ADHD group.

In general, the clinical groups performed comparably to honest, nonclinical controls on neurocognitive feigning measures. In line with the hypothesis, individuals assigned to malinger ADHD performed significantly worse than clinical controls on the vast majority of tests given. The measures with the highest effect sizes for differentiating malingered ADHD from honest ADHD controls included the TOMM, the NV-MSVT, the CTIP CRT Med RT and SRT Med RT, and the WJ-III RF A-E. These same variables best differentiated malingered ADHD from comorbid ADHD, with the exception of the WJ-III RF A-E and the addition of the LMT.

Though effect size is a good indicator for the magnitude of between group differences, it is necessary to examine utility indicators at published cut scores for each of the measures to determine how well the tests hold up in a clinical setting. The established cut scores generally exhibited modest to moderate sensitivity to malingering, with specificity to honest ADHD ranging from moderate to high and specificity to comorbid ADHD ranging from modest to high. Contrary to the hypothesis, the DMT demonstrated the poorest sensitivity to malingering.

Evaluating Positive and Negative Predictive Power provides more information about the utility of the tests in a clinical setting because of the advantage of incorporating base rate information. A base rate of 50% maximizes classification accuracy, and at this base rate, the TOMM, DMT, and LMT achieved PPP > .90, with most other measures exhibiting PPP in the .70 to .90 range. This means that there is a strong likelihood that someone classified as feigning was actually a malingerer. NPP at this base rate was

between .50 and .70, indicating moderate likelihood that the individuals who were identified as honest were actually giving their best effort. At a 25% base rate, which likely more closely approximates base rate of malingering ADHD in the general college population, PPP was typically between .50 and 1.00 with the lowest PPP (WJ-III RF A-E) falling in the .30 range. NPP for all variables fell within the .80 range, with the exception of the DMT which fell in the .70 range.

Examining incremental validity when failure on multiple tests is required for malingering classification indicated that failure on at least two tests produces the highest hit rate when both SVTs and embedded indices are examined and at least one test when only dedicated SVTs are examined. These conclusions are consistent with the findings of Jasinski, Harp, et al. (2011). The results of the hierarchical logistic regression indicated that the dedicated effort tests still achieve the highest classification accuracy. Specifically, failure on both the TOMM and the LMT identified 89.5% of the overall sample correctly when tests were introduced individually into the model in a forward stepwise fashion. This suggests that these tests used in combination are likely to be most useful for detecting malingered ADHD in a college setting.

This study also sought to expand the current knowledge of the utility of these measures for ADHD evaluations by examining their discriminant validity when individuals with comorbid ADHD diagnoses are compared to individuals malingering ADHD. Generally, the present results indicate that although the dedicated effort tests can differentiate malingered and true ADHD and malingered and comorbid ADHD equally well, the specificity of the embedded indices (WAIS-IV Processing Speed Index and WJ-III RF A-E) to comorbid ADHD is less impressive. There was not a statistically

significant difference between the malingerers and the individuals with comorbid ADHD on the PSI and A-E variables, and the individuals with comorbid ADHD actually performed statistically significantly worse than the ADHD only group on the WJ-III RF A-E, in line with the hypothesis. Along with this theme, the incremental validity analyses for number of tests failed indicated that inadequate effort, as indicated by performance below or above the established cut score, on one additional test should be required for the comorbid ADHD group when looking at both dedicated SVTs and embedded indices. In other words, in order to obtain respectable specificity for comorbid ADHD, failure on three tests should be demonstrated prior to classifying someone as malingering. Overall, the previous findings were supported, though the results of this study were generally less robust, probably due to smaller samples.

Limitations

The simulation design generally displays strong internal validity relative to known group designs, but the concern is that this may come at the expense of external validity. The internal validity of the present study was bolstered with efforts to ascertain the success of malingering instruction by providing monetary incentives, administering instruction checks to ensure that the participants understood their roles, and giving post-test questionnaires to gauge effort and perceived success. As with any simulation design, external validity is sacrificed to some degree given that laboratory settings do not perfectly approximate that of a clinical evaluation. This study endeavored to control this issue to some extent by providing a realistic and age-relevant scenario and monetary incentives to participants and also by including a comorbid group. However, it is still not

certain whether these incentives are adequate or if these individuals truly mirror or resemble real world malingerers.

A second issue with the study is that the researcher could only establish the credibility of participants' ADHD diagnoses to a limited extent. Though the researcher could not review medical records for the participants, some restrictions were set in place. For example, individuals were only recruited to participate in the study if their ADHD diagnoses were based on at least a clinical interview and a minimum of one other source of information. Past studies have recognized the distinct possibility that some individuals in their clinical control groups may have received their ADHD diagnoses through exaggeration or fabrication of symptoms. In order to decrease this potential issue, participants were only recruited for the clinical groups if they had received their diagnoses prior to the age of 18, which is the age most individuals are when they begin their college career. Furthermore, more than half of the ADHD-H sample was diagnosed by the age of 12 (no statistically significant differences on any variables between those who were and those who were not), providing further support for the credibility of the diagnoses. Unfortunately, no restrictions could be placed on the diagnoses of the comorbid anxiety and learning disorders due to low base rates of comorbidity of these specific disorders in this specific college population.

Several limitations are apparent with regards to the ADHD-CO group. The group is essentially dichotomous given that the initial ADHD-ANX and ADHD-LD groups were combined to increase the sample size. Due to probable differences in presentation between these two subgroups as well as the very small individual sample sizes, analyses for the ADHD-CO group were likely underpowered, and it is not surprising that no

differences between the two subgroups were found. Furthermore, the diagnoses within each subgroup are also heterogeneous. Additionally, it is uncertain whether the performances of individuals in the ADHD-CO group would be comparable to the average individual presenting for an ADHD evaluation in a college setting since many individuals with diagnosed anxiety disorders were currently receiving treatment for their symptoms, and most individuals with diagnosed learning disorders had received these diagnoses at a younger age and learned to function within those parameters over time.

Conclusions

In summary, recognition of the prevalence of malingering ADHD in order to obtain unfair advantages within the college environment is on the rise. More research is acknowledging the importance of detecting malingering in ADHD evaluations to prevent unwarranted distribution of medications and allocation of accommodations within an academic setting. The present study has added to the field by providing further support in cross-validating the findings of previous studies which indicate the utility of multiple dedicated and embedded effort tests within the clinical evaluation context. Furthermore, this study has illustrated that the presence of a comorbid diagnosis does somewhat reduce the specificity of the embedded measures. Clinicians need to be especially sensitive to the complexities of the comorbid presentation and weigh their theories against multiple sources of data prior to making a final conclusion regarding potential malingering in the context of a comorbid ADHD evaluation. A large-scale study spanning multiple college campuses would be ideal for obtaining the necessary sample sizes to adequately examine the problem of malingering in the context of comorbid ADHD.

Appendix A: Mass Screening Form

What is your: STUDENT ID # _____

AGE: _____

GENDER: _____

Year in school:_____

Do you have a diagnosis of Attention Deficit/Hyperactivity Disorder (ADHD) or Attention Deficit Disorder (ADD)?

YES or **NO**

If YES, how old were you when you were diagnosed with ADHD or ADD? _____

Are you currently prescribed stimulant medication (Adderall, Ritalin, Concerta, Straterra, etc.) for ADHD?

YES or **NO**

Have you ever been prescribed stimulant medication (Adderall, Ritalin, Concerta, Straterra, etc.) for ADHD?

YES or **NO**

Are you currently receiving academic accommodations (extra test time, financial aid, electronic aids) as a result of having ADHD?

YES or **NO**

In school as a child, did you ever receive any special services (tutoring, special classes, extra time on tests) as a result of having ADHD?

YES or **NO**

Do you have a close friend or family member with ADHD?

YES or **NO**

How many people do you know who have used stimulant medications without a prescription (not including yourself)?

Circle your answer: **None** **1 – 2** **3 – 4** **5 or more**

How many people do you know who have faked or exaggerated problems to get a prescription for stimulant medication (not including yourself)?

Circle your answer: **None** **1 – 2** **3 – 4** **5 or more**

Have you ever been evaluated and/or treated for a learning problem (not including ADD/ADHD) such as **dyslexia**, a **reading disorder**, or a problem with **written language**, for example?

YES or **NO**

Have you ever been diagnosed with a learning problem such as those mentioned above?

YES or **NO**

If YES, what diagnosed learning problem do you have?

Have you ever received special help or accommodations within the school system because of a diagnosed learning problem with reading and/or writing?

YES or **NO**

Have you ever been evaluated and/or treated for anxiety?

YES or **NO**

Do you have a diagnosed anxiety disorder?

YES or **NO**

If YES, what diagnosed anxiety disorder do you have?

Are you currently being treated for anxiety?

YES or **NO**

If YES, what medications are you taking for anxiety?

Are you currently being treated for depression?

YES or **NO**

If YES, what medications are you taking for depression?

Do you have a history of:

Brain injury? **YES** or **NO**

Hallucinations or delusions? **YES** or **NO**

Depression? **YES** or **NO**

Have you been diagnosed with any other psychological or psychiatric disorder?

YES or **NO**

IF YES, what diagnoses have you received?

Appendix B: Recruitment Flier

Attention UK Undergraduates!!!

Do you have Attention Deficit Disorder? (ADD or ADHD)

If so, you can get paid $40
to participate in a research study being conducted at the University of Kentucky.

We would like to see how effective
various tests are at diagnosing ADHD
in college students.

please call or text for more information:
Kim
(502) 779-1481

Paid Research Study (502) 779-1481
Paid Research Study (502) 779-1481
Paid Research Study (502) 779-1481
Paid Research Study (502) 779-1481
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Appendix C: General Phone Screening Form

General Phone Screening Form

(if PSY 100 Student) **SAY:** ***My name is __ and I'm calling from the Department of Psychology. I'm contacting you because you completed the psychology online screening and indicated interest in a research study for psychology research credits.*** *I have a 5-credit study. Do you still need research credits at this time?* (if Yes): *Great! I'd like to tell you more about the study, but first I need to get some general information to see if you qualify. Only your first name and phone number will be associated with the information you provide, if you tell me at the end of this call that you are still interested. Ok?*

(if Non-PSY 100 Student) **SAY:** ***My name is __ and I'm calling from the Department of Psychology. I'm contacting you because you expressed interest in participating in Kim Williamson's paid research study on ADHD.*** *Is this a good time for you?* (if Yes): *Great! I'd like to tell you more about the study, but first I need to get some general information to see if you qualify. Only your first name and phone number will be associated with the information you provide, if you tell me at the end of this call that you are still interested. Ok?*

1. How old are you?_____
If younger than 18 or older than 25, stop and thank them for their time.

2. Are you an undergraduate student? Yes No

If Yes:
What school do you attend: _____

If No:
What is your occupation: _____

3. What year are you in school? F So Jr Sr Other: (_____th semester)

4. What is your first language?: _____

5. This is a study about ADHD and other psychological disorders. We have openings for people with *and* without ADHD. Have you been ever diagnosed with ADHD? Yes No
If yes, stop here and switch to ADHD Group phone screening.
If no, proceed to next question.

5. Do you currently have a diagnosis of anxiety disorder (includes all DSM-IV Anxiety Disorders; E.G. Generalized Anxiety, Social Phobia, Obssessive Compulsive Disorder, Panic Disorder, etc.)?
Yes No

If yes to #5, inquire about specific diagnoses:
_____

6. Do you currently have a diagnosis of a learning disability (includes DSM-IV learning disorders; E.G. Writing Disorder [dysgraphia], Reading Disorder [dyslexia])? Yes No

If yes to #6, inquire about specific diagnoses: -
_____

7. Have you been diagnosed with any other psychological or psychiatric disorders (includes Bipolar Disorder, Schizophrenia, Personality Disorders, etc.)? Yes No

If yes to #7, inquire about specific diagnoses:
_____

8. Have you been diagnosed with a neurological disorder (includes things like Epilepsy, Tourrettes, Central Processing Disorder; If unsure, call or google)? Yes No

If yes to #8, inquire about specific diagnoses:
_____

If yes to 6, 7, or 8, EXCLUDE (unless comorbid ADHD; in which case, you would no longer be on this form).

9. Have you ever had a head injury (including minor concussions)? Yes No

If yes, ask the following questions:

- Have you had a head injury more severe than a concussion? Yes No
  If yes, Exclude
  If they are unsure, ask the following question:

  - Did you lose consciousness? Yes No
  If yes: For how long?_____

  - Were you hospitalized? Yes No
  If yes: For how long?_____

  - Did you have any tests run? Yes No
  If yes: Which and what did they find?_____

Exclude for LOC >30 min., positive brain imaging findings (indicating complicated mTBI), or extensive hospitalization.

-How many past concussions have you had? _____

-When was your most recent concussion? _____

Exclude for more than 2 previous concussions or concussion within the last 6 months.

If no to all of the above,…

SAY: *Thank you very much for answering these questions. Now let me tell you more about the study. This study involves you taking a number of different tests that are used to diagnose ADHD and other psychological disorders. We are interested in whether these tests can discriminate between people with ADHD and people without it. The tests are all pencil /paper, verbal, or computerized. If you participate, it will take about 4 hours of your time and you will be compensated 5 research credits.*

Are you still interested in participating? Yes No

If Yes: Collect contact information If No: STOP. *Thank you for your time.*

10. First name:_____ Phone:_____

11. Gender: M F

12. Date/time scheduled: _____

13. Group assignment: _____

14. Examiners: _____

Appendix D: ADHD Phone Screening Form

ADHD Phone Screening Form

After switching from General phone screening:

I'd like to ask you more about the process you went through to get your diagnosis of ADHD.

1. When were you diagnosed (age/grade/year?)_____
If 18 or older at the time of diagnosis, tell them that we are only collecting data from individuals who received their diagnoses before the age of 18. Thank them for their time.

2. What subtype of ADHD is your diagnosis (Inattentive, Hyperactive, Combined, Not Otherwise Specified [NOS]?_____

3. What sort of health care professional gave you this diagnosis? _____
Be sure to figure out whether it was a psychologist, psychiatrist, or just family physician.

4. Did you take any tests to get your diagnosis? Yes No
(If yes): What sorts of tests
__ pencil / paper that asked about your symptoms
__ pencil / paper not asking specifically about symptoms
__ Computerized
__ Tests of other cognitive abilities, thinking, or learning

5. Did your parent or guardian fill out any questionnaires? Yes No

6. Do you remember how long this evaluation took? (# Appts, # Hours)
_____

7. Was there someone who came into your school classroom to observe you? Yes No----
-Diagnosis must be based on a *minimum* of self-report and parent-report measures *or* self-report and clinical interview. Self-report only or less is not acceptable.
-If you are unsure about the credibility of their diagnosis, finish the interview and tell them you will call them back for scheduling purposes. Contact me about this.

8. Do you have access to a diagnostic report or evaluation? Yes No

9. Are you taking medication for this right now? Yes No
What kind (If yes): _____
How long have you been taking it:_____

10. About how often do you skip a dose, either accidentally or on purpose? _____
Make sure you check about whether they take it on the weekends (many people don't and don't consider this skipping).

11. Are you receiving accommodations in any of your courses or through the university? Yes No
If so, what types of help are you getting? _____
Common accommodations include extra test time (ask how much extra [50%; 100%], teacher's notes and ppts, testing in a private room, priority registration, preferred seating for tests).

12. We also have openings for people with and without a history of anxiety disorder. Have you been diagnosed with anxiety disorder? Yes No
If yes, complete ANX Group phone screening.
If no, proceed to next question.

13. We also have openings for people with and without a history of learning disabilities. Have you been diagnosed
with a learning disability? Yes
No
If yes, complete LD Group phone screening.
If no, proceed to next question.

14. Have you been diagnosed with any other psychological, psychiatric, or neurological disorders, or had a head
injury? Yes
No
If yes, which: _____

-If yes to #14, get information about specific diagnoses. If their only additional diagnosis is depression, get additional information about type of depression diagnosis and current treatment. They can still participate. Also, if they have a history of brain injury, do not exclude for less than 3 past concussions. (see General Phone Screening for more info)
-If other disorders than those indicated above, tell them we are not collecting data from individuals with those specific diagnoses. Thank them for their time.

If no to all of the above,…

SAY: *Thank you for answering these questions. Now let me tell you more about the study. This is a study about the ability of some tests to properly diagnose people who do or do not have ADHD. The study takes about 3 to 3.5 hours and you will be compensated with (5 research credits or $40). This study involves you taking a number of different tests that are used to diagnose ADHD. Some of them you may have taken before. These are all pencil/paper or computerized tests. The study is conducted at Kastle Hall (ask if they know where it is and tell them if they don't).* ***One requirement of the study is that you not take your stimulant medication for 12 hours before your participation, so that we can know how people with ADHD do without treatment. Would you be interested in participating?*** Yes No

If Yes: Collect contact information If No: STOP. *Thank you for your time.*

Go ahead and schedule if you can.

15. First name_____ Phone_____

16. Gender: M F

17. Date/Time Scheduled: _____

18. Group Assignment: _____

19. Examiners: _____

Appendix E: Anxiety Phone Screening Form

ANX Phone Screening Form

After completing ADHD phone screening:

1. What type of anxiety disorder have you been diagnosed with? _____

2. When were you diagnosed (age/grade/year?)_____

3. What sort of health care professional gave you this diagnosis? _____

4. Now I'd like to ask you about the process you went through to get diagnosed. (Same evaluation or different?)

Did you take any tests? Yes No

(If yes): What sorts of tests

__ pencil / paper that asked about your symptoms
__ pencil / paper not asking specifically about symptoms
__ Computerized
__ Tests of other cognitive abilities, thinking, or learning

5. Did your parent or guardian fill out any questionnaires? Yes No

6. Do you remember how long this evaluation took?

_____

7. Do you have access to a diagnostic report or evaluation? Yes No

8. Are you taking medication for this right now? Yes No

What kind (If yes): _____

How long have you been taking it:_____

9. Have you ever received any type of counseling services? Yes No

If yes, what type: _____

10. Are you receiving any type of counseling services at the present time? Yes No

If yes, what type: _____

11. Are you still experiencing any symptoms? Yes No

12. Do you also currently have a diagnosis of a learning disability? Yes No

If yes, switch to LD screening form.

13. Have you been diagnosed with any other psychological, psychiatric, or neurological disorders, or had a head injury?

Yes No

If yes, which: _____

If yes to #13, get information about specific diagnoses. If their only additional diagnosis is depression, get additional information about type of depression diagnosis and current treatment. They can still participate. Also, if they have a history of brain injury, do not exclude for less than 3 past concussions. (see General Phone Screening for more info)

If other disorders than those indicated above, tell them we are not collecting data from individuals with those specific diagnoses. Thank them for their time.

If no to all of the above,…

SAY: *Thank you for answering these questions. Now let me tell you more about the study. This is a study about the ability of some tests to properly diagnose people who do or do not have ADHD. The study takes about 3 to 3.5 hours and you will be compensated with (5 research credits or $40). This study involves you taking a number of different tests that are used to diagnose ADHD. Some of them you may have taken before. These are all pencil/paper or computerized tests. The study is conducted at Kastle Hall (ask if they know where it is and tell them if they don't).* ***One requirement of the study is that you not take your stimulant medication for 12 hours before your participation, so that we can know how people with ADHD do without treatment. Would you be interested in participating?*** Yes No

If Yes: Collect contact information If No: STOP. *Thank you for your time.*

Go ahead and schedule if you can.

14. First name_____ Phone_____

15. Gender: M F

16. Date/Time Scheduled: _____

17. Group Assignment: _____

18. Examiners: _____

Appendix F: Learning Disorder Phone Screening Form

LD Phone Screening Form

After completing ADHD phone screening:

1. Have you been diagnosed with a learning disability? Yes No
   If Yes, which: _____

If disorder of writing (dysgraphia) or disorder of reading (dyslexia), proceed to next question.

If the LD is for math only, tell them we are not collecting data from individuals with that type of LD. However, don't exclude for math and reading or writing. Thank them for their time.

2. When were you diagnosed (age/grade/year?)_____

3. What sort of health care professional gave you this diagnosis? _____

4. Now I'd like to ask you about the process you went through to get diagnosed (Same eval or different?).
   Did you take any tests? Yes No
   (If yes): What sorts of tests
   __ pencil / paper that asked about your symptoms
   __ pencil / paper not asking specifically about symptoms
   __ Computerized
   __ Tests of other cognitive abilities, thinking, or learning

5. Did your parent or guardian fill out any questionnaires? Yes No

6. Do you remember how long this evaluation took?
_____

7. Was there someone who came into your school classroom to observe you? Yes No

8. Do you have access to a diagnostic report or evaluation? Yes No

9. Are you taking medication for this right now? Yes No
   What kind (If yes): _____
   How long have you been taking it:_____

10. About how often do you skip a dose, either accidentally or on purpose? _____

11. Are you receiving accommodations in any of your courses or through the university? Yes No
    If so, what types of help are you getting? _____

12. Do you also currently have a diagnosis of anxiety? Yes No
    If yes, complete LD screening if you haven't already.

13. Have you been diagnosed with any other psychological, psychiatric, or neurological disorders, or had a head injury?
    Yes No
    If yes, which: _____

If yes to #13, get information about specific diagnoses. If their only additional diagnosis is depression, get additional information about type of depression diagnosis and current treatment. They can still participate. Also, if they have a history of brain injury, do not exclude for less than 3 past concussions. (see General Phone Screening for more info)

If other disorders than those indicated above, tell them we are not collecting data from individuals with those specific diagnoses. Thank them for their time.

If no to all of the above,…

SAY: *Thank you for answering these questions. Now let me tell you more about the study. This is a study about the ability of some tests to properly diagnose people who do or do not have ADHD. The study takes about 3 to 3.5 hours and you will be compensated with (5 research credits or $40). This study involves you taking a number of different tests that are used to diagnose ADHD. Some of them you may have taken before. These are all pencil/paper or computerized tests. The study is conducted at Kastle Hall (ask if they know where it is and tell them if they don't).* ***One requirement of the study is that you not take your stimulant medication for 12 hours before your participation, so that we can know how people with ADHD do without treatment. Would you be interested in participating?***

Yes No

If Yes: Collect contact information

If No: STOP. *Thank you for your time.*

Go ahead and schedule if you can.

14. First name_____ Phone_____

15. Gender: M F

16. Date/Time Scheduled: _____

17. Group Assignment: _____

18. Examiners: _____

Appendix G: Demographics Questionnaire

Demographics Questionnaire

INSTRUCTIONS: ***Please respond to the following as best you can. You do not need to share your responses with the examiner. Your responses will NOT be associated with your name. Please put this in the envelope and seal it when done.***

Gender: M F

Age: _____

Handedness: R L

Ethnic background:

African American	Hispanic/Latino	Native American
Asian/Pacific Islander	Caucasian	Other_____

Education: Freshman Sophomore Junior Senior Other _____

Please check which apply to you. If you respond "Yes," please answer the Additional questions below:

1. Color Blindness □N □Y

2. Repeated a Grade □N □Y

3. Knocked Unconscious □N □Y

(respond for most severe occurrence)
Length of Time: Unconscious_____ Hospitalized_____
Age of occurrence: _____ Do you remember this happening?_____

4. Attention Deficit Disorder □N □Y

Type: _____ Age diagnosed:_____
What medication do you take for this?_____
Have you taken medication for this in the past 12 hours? Y / N

5. Learning Disability □N □Y

Type: _____ Age diagnosed:_____

6. Current Mood, Anxiety, or Thought Disorder □N □Y

(list separately)
Type: _____ Age diagnosed:___ Are you currently being treated? Y / N
Type: _____ Age diagnosed:___ Are you currently being treated? Y / N
Type: _____ Age diagnosed:___ Are you currently being treated? Y / N

7. Neurological or Neuro-degenerative Disorder □N □Y

(list separately)
Type: _____ Age diagnosed:___ Are you currently being treated? Y /N
Type: _____ Age diagnosed:___ Are you currently being treated? Y /N

Thank you! Please seal this in the envelope provided.

Appendix H: Instructions for Honest Group

Instructions for Honest Groups

Today you will complete a series of psychological tests much like a clinician would use to test someone for Attention Deficit/Hyperactivity Disorder (ADHD). You should try your hardest on these tests and give your very best effort throughout the testing session.

Are you comfortable with these instructions? Do you still wish to participate in the study?

You will now be introduced to the person who will complete testing with you. The examiner does not know what instructions you have been given, so please do not give it away!

If you have any questions, please take the time to ask them right now.

Appendix I: Instructions for Malingering Group

Instructions for NLM group

Congratulations! You have been selected for a chance to win $25 cash!

Today you will complete a series of psychological tests much like a clinician would use to test you for attention deficit/hyperactive disorder (ADHD). Normally, you would be asked to try your best on these tests. That is *not* what we want you to do today. Instead, we want you to perform on the tests exactly how you think someone with ADHD would perform. That is, you should try to take the tests in such a way that you look like you have ADHD. The tests have scales designed to detect people who are faking, so *be careful not to be too obvious*. If you can take the tests in such a way that you are classified as having ADHD without the examiner knowing you are faking, you will receive $25 cash at the end of testing. It will help if you imagine the following scenario:

You have a friend on campus who has just been diagnosed with ADHD. She is prescribed a stimulant drug (like Ritalin or Adderall) that makes her concentrate better and stay awake more easily. Studying becomes much easier for her and takes less time. Meanwhile, her grades have improved. On top of that, the University gives her extra time to complete exams and other assignments because she has ADHD. Because schoolwork is easier, she is able to socialize more often. She tells you that all she had to do was take a few tests to receive her diagnosis. You feel you could really use some extra time on exams and assignments, and it would be great to have some medication to help you study faster, so you decide you will try to get a diagnosis, too. You search the internet for information on ADHD, and you make an appointment for testing.

The next few pages contain the information you might find in an internet search for ADHD.

[*After preparation*]
Are you comfortable with these instructions? Do you still wish to participate in the study?
You will now be introduced to the person who will complete testing with you.
Please take the following tests as if you are trying to convince someone that you have ADHD. You should respond to the test items in a way that makes clear that you have ADHD. The examiner who tests you will not know what instructions you have been given, so please do not give it away!

Remember, if you are successful at deceiving the tests without being detected by the examiner as faking, you will win $25! If you have any questions, please take the time to ask them right now.

Appendix J: Internet Information Packet on ADHD

Internet Information on ADHD

The next several pages will provide you with information about ADHD that you can easily access via the internet. You will need to read the following information carefully. Feel free to underline or write notes on these pages. At the end of the internet information, you will be asked to jot down a few symptoms or characteristics of people with ADHD to help you make sure the tests classify you as having ADHD.

Website 1

Address	http://www.daytrana.com/?SOURCE=GOOG&KEYWORD=p

WHAT ARE THE SYMPTOMS OF ADHD?

- The most common behaviors exhibited by those who have ADHD are inattention, hyperactivity, and impulsivity. People with ADHD often have difficulty focusing, are easily distracted, have trouble staying still, and frequently are unable to control their impulsive behavior.
- Because everyone shows signs of these behaviors at times, the DSM-IV-TR specifies that the behaviors must appear early in life (before age 7) and continue for at least six months.
- In children, these behaviors must be more frequent or severe than in other children the same age. In addition, the behaviors must interfere with at least two areas of a person's life, such as paying attention in school, completing homework, or making friends.
- ADHD in adults looks much as it does in children, except that much less hyperactivity is present. Still, inattention and impulsivity can have a major effect on functioning at work and in social relationships. People often have difficulty focusing, are easily distracted, have trouble staying still, and frequently are unable to control their impulsive behavior.

Website 2

Address	http://www.adultADHD.com/2_2_recognizing/2_2_recognizing.jsp

Recognizing Adult ADHD

Fidgeting, interrupting conversations, losing things, forgetting the reason for a trip to the grocery store – everyone acts this way once in a while. But a long and persistent history of restless, impulsive, or inattentive behavior may be a sign of Adult ADHD. This is especially true if these behaviors have existed since childhood and result in problems at work, home, and/or in social situations.

If you think you may have Adult ADHD, here are several questions you may want to ask yourself. These are some of the questions that can help doctors and healthcare professionals screen for Adult ADHD.

Ask yourself these questions and think about how long you have experienced these symptoms and how often they occur. If these symptoms are interfering with your success at home, at work or with friends, you may want to talk with your doctor or healthcare professional about a clinical evaluation.

- Do you have difficulty concentrating or focusing your attention on one thing?
- Do you often start multiple projects at the same time, but rarely finish them?
- Do you have trouble with organization?
- Do you procrastinate on projects that take a lot of attention to detail?
- Do you have problems remembering appointments or obligations?
- Do you have trouble staying seated during meetings or other activities?
- Are you restless or fidgety?
- Do you often lose or misplace things?

On the next two pages are diagnostic screening tests you find. Please read through the questions. You do not need to complete the tests.

Website 3

Address	http://www.adultADHD.com/2_2_recognizing/2_2_recognizing.jsp

Screener Test

Many adults have been living with Adult Attention-Deficit Disorder (Adult ADHD) and don't recognize it. Why? Because its symptoms are often mistaken for a stressful life. If you've felt this type of frustration most of your life, you may have Adult ADHD; a condition your doctor can help diagnose and treat.

Adult Self-Report Scale (ASRS – V1.1) Screener
from WHO Composite International Diagnostic Interview
© World Health Organization

	Never	Rarely	Sometimes	Often
How often do you have trouble wrapping up the final details of a project, once the challenging parts have been done?	◘	◘	◘	◘
How often do you have difficulty getting things in order when you have to do a task that requires organization?	◘	◘	◘	◘
How often do you have problems remembering appointments or obligations?	◘	◘	◘	◘
When you have a task that requires a lot of thought, how often do you avoid or delay getting started?	◘	◘	◘	◘
How often do you fidget or squirm with your hands or your feet when you have to sit down for a long time?	◘	◘	◘	◘
How often do you feel overly active and compelled to do things, like you were driven by a motor?	◘	◘	◘	◘

Website 4

Address	http://psychcentral.com/ADHDquiz.htm

Adult ADD/ADHD Test

Jasper/Goldberg Adult ADHD Screening Quiz
by Larry Jasper & Ivan Goldberg

Instructions: The 24 items below refer to how you have behaved and felt DURING MOST OF YOUR ADULT LIFE. If you have usually been one way and recently have changed, your responses should reflect HOW YOU HAVE USUALLY BEEN. For each item, indicate the extent to which it is true by checking the appropriate box next to the item.

1. At home, work, or school, I find my mind wandering from tasks that are uninteresting or difficult.
2. I find it difficult to read written material unless it is very interesting or very easy.
3. Especially in groups, I find it hard to stay focused on what is being said in conversations.
4. I have a quick temper... a short fuse.
5. I am irritable, and get upset by minor annoyances.
6. I say things without thinking, and later regret having said them.
7. I make quick decisions without thinking enough about their possible bad results.
8. My relationships with people are made difficult by my tendency to talk first and think later.
9. My moods have highs and lows.
10. I have trouble planning in what order to do a series of tasks or activities.
11. I easily become upset.
12. I seem to be thin skinned and many things upset me.
13. I almost always am on the go.
14. I am more comfortable when moving than when sitting still.
15. In conversations, I start to answer questions before the questions have been fully asked.
16. I usually work on more than one project at a time, and fail to finish many of them.
17. There is a lot of "static" or "chatter" in my head.
18. Even when sitting quietly, I am usually moving my hands or feet.
19. In group activities it is hard for me to wait my turn.
20. My mind gets so cluttered that it is hard for it to function.
21. My thoughts bounce around as if my mind is a pinball machine.
22. My brain feels as if it is a television set with all the channels going at once.
23. I am unable to stop daydreaming.
24. I am distressed by the disorganized way my brain works.

When you are done reviewing these materials, please use the paper to jot down symptoms that will help you remember how to fake on the tests you will be given. Tell the examiner when you are done.

Appendix K: Instruction Check for Malingering Group

Instruction Check

Please write below the instructions you have been given. The researcher will also ask you to verbally describe the role you have been asked to fulfill.

Please list below several characteristics of individuals with Attention Deficit Hyperactivity Disorder:

1.

2.

3.

Please list a few strategies you will use to convince the tests that *you have* Attention Deficit Hyperactivity Disorder:

1.

2.

3.

If you have any questions at all, please take the time to ask them now!

Appendix L: Post-Test Questionnaire

Post-test Questionnaire

Please write the instructions (role) you were given at the very beginning of this study:

How well did you understand these instructions given at the very beginning?

1	2	3	4	5
Not at All		Somewhat Understood		Perfectly Well

How hard did you try to follow the instructions or role given at the very beginning?

1	2	3	4	5
Not at All		Somewhat Hard		Your Hardest

How difficult was it for you to adhere to the instructions and play the role throughout the session?

1	2	3	4	5
Not at All		Somewhat Difficult		Very Difficult

How successful do you think you were at following those instructions or playing the role?

1	2	3	4	5
Not at All		Somewhat Successful		Extremely Successful

How motivating was the incentive offered for successfully playing the role?

1	2	3	4	5
Not at All		Somewhat Motivating		Extremely Motivating

What strategies did you use to make sure you followed your instructions?

1.

2.

3.

Appendix M: Debriefing Form for Honest Groups

Explanation of Study: Debriefing Form for Honest Groups

Thank you for participating in our study! As we told you in the beginning, the purpose of this study is to determine how effectively some tests discriminate between individuals with and without ADHD, as well as other psychological disorders. Such information is important to accurately diagnosing students who deserve accommodations and need treatment for the disorder.

In this study, some students were instructed to fake having ADHD, and they will be compared to a group of students who have been previously diagnosed with ADHD and also to a group of students who have been diagnosed with ADHD and either anxiety or a learning disability. Thus, the independent variable is whether a person was instructed to fake or answer honestly. The dependent variable is how well the groups will perform on the different tests. We hypothesize that some of the tests will be better able to detect who is faking, but we are unsure of which tests will do the best. The tests used in this study are often used to detect faking of a brain injury and have also been used to detect faking of ADHD, and now we want to see how well they are able to differentiate feigned ADHD from comorbid ADHD/Anxiety and comorbid ADHD/LD.

We ask that you do not discuss this with anyone. If others know how the study is run, then we will not get the effort and motivation from participants necessary for us to determine if these tests really work! This is an important study that can bring the University of Kentucky much recognition if it is run properly, so please do not discuss what you did with anyone!

Thank you again for your participation! It would not be possible to continue psychological research without your goodwill and cooperation. We hope that you enjoyed this experiment. If you would like to learn more about faking of disorders, please feel free to contact the primary investigator or consult the references below. We expect to have the results analyzed by next summer, so feel free to contact the primary investigator if you are interested in the findings.

Kimberly Williamson
111-C Kastle Hall
(502) 779-1481

References:

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Appendix N: Debriefing Form for Malingering Group

Explanation of the Study: Debriefing Form for Faking Group

Thank you for participating in our study! As we told you in the beginning, the purpose of this study is to determine how effectively some tests discriminate between individuals with true ADHD and individuals asked to fake ADHD. Such information is important to accurately diagnosing students who deserve accommodations and need treatment for the disorder.

In this study, some students were instructed to fake having ADHD, and they will be compared to a group of students who have been previously diagnosed with ADHD and also to a group of students who have been diagnosed with ADHD and either anxiety or a learning disability. Thus, the independent variable is whether a person was instructed to fake or answer honestly. The dependent variable is how well the groups will perform on the different tests. We hypothesize that some of the tests will be better able to detect who is faking, but we are unsure of which tests will do the best. The tests used in this study are often used to detect faking of a brain injury and have also been used to detect faking of ADHD, and now we want to see how well they are able to differentiate feigned ADHD from comorbid ADHD/Anxiety and comorbid ADHD/LD.

In order to motivate you to fulfill your role as well as you could, we offered that you would receive a "bonus incentive" of $25 if you followed instructions and were successful in your role. In reality, everyone who received this role is given this incentive, regardless of how well they were able to fake ADHD. We said it would only be earned if you were successful to make sure you were motivated and tried your hardest to follow your instructions.

We ask that you do not discuss this with anyone. If others know how the study is run, then we will not get the effort and motivation from participants necessary for us to determine if these tests really work! This is an important study that can bring the University of Kentucky much recognition if it is run properly, so please do not discuss what you did with anyone!

Thank you again for your participation! It would not be possible to continue psychological research without your goodwill and cooperation. We hope that you enjoyed this experiment. If you would like to learn more about faking of disorders, please feel free to contact the primary investigator or consult the references below. We expect to have the results analyzed by next summer, so feel free to contact the primary investigator if you are interested in the findings.

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References:

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.

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Appendix O: Permission for Use of Data Form

Permission for Use of Data

If you do not wish to have your data included, please tell the examiner now.

I MAINTAIN CONSENT / WITHDRAW CONSENT to have my data used in this study. (circle one)

_____
Print Name Date

_____
Sign Name

_____
Witness Date

Appendix P: Permission to Contact for Future Research

Permission to Contact for Future Research

Would you be interested in participating in future studies about Attention Deficit-Hyperactivity Disorder?

_____Yes _____ No

Would you like to be contacted for future research opportunities in this research area?

_____Yes _____ No

If so, please list:

Name:_____

Phone #:_____

Email:_____

Appendix Q: Payment Receipt for NLM Participants

Receipt for Payment

I acknowledge that I have received $25 payment for my participation in the study "Discriminating Between Malingered and Comorbid Attention Deficit/Hyperactivity Disorder in a College Sample."

Name (Printed): _____

Signature: _____

SS#: _____

Date: _____

Witness: _____

Appendix R: Payment Receipt for Clinical Participants Not in Need of Research Credits

Receipt for Payment

I acknowledge that I have received $40 payment for my participation in the study "Discriminating Between Malingered and Comorbid Attention Deficit/Hyperactivity Disorder in a College Sample."

Name (Printed): _____

Signature: _____

SS#: _____

Date: _____

Witness: _____

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Therapist April 2012 – June 2012

Jesse G. Harris Psychological Services Center
University of Kentucky, Department of Psychology
Therapist September 2011 – Present

Cardinal Hill Rehabilitation Hospital, Lexington, KY
Neuropsychology Intern 2011 – 2012

Edelson & Associates, Louisville, KY
Psychology Intern 2009 – 2010

The Infant & Child Temperament and Cognition Lab
Bellarmine University
Research Assistant 2009

PRESENTATIONS

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 Annual Meeting, February 2012, Montreal, Canada and at the Kentucky Psychological Association Spring Academic Conference, March 2012, Lexington, KY.

Williamson, K. D. (2009, Spring) A survey of knowledge and acceptance of mental illness and psychopharmacology in a college population. Paper symposium presented at the Mid-America Undergraduate Psychology Research Conference in Franklin, Indiana.

Williamson, K. D. (2009, Spring) A survey of knowledge and acceptance of mental illness and psychopharmacology in a college population. Poster presented at the annual Kentucky Psychological Association convention in Lexington, KY.

PUBLICATIONS

Mason, L.H., Shandera-Ochsner, A.L., **Williamson, K.D.,** Harp, J.P, Edmundson, M., High, W.M., & Berry, D.T.R. (revised and resubmitted, recommended by action editor for publication). Accuracy of MMPI-2-RF validity scales for identifying feigned PTSD symptoms, random responding, and genuine PTSD.

TEACHING EXPERIENCE

Teaching Assistant: Graduate Level

Personality Assessment
University of Kentucky — Spring 2012

Teaching Assistant: Undergraduate Level

Experimental Psychology
University of Kentucky — Fall 2010-Fall 2011
Learning and Cognition (Online)
University of Kentucky — Summer 2011, Summer 2013
Research Methods
Bellarmine University — Spring 2010

AWARDS and HONORS

Recipient of the Daniel R. Reedy Quality Achievement Award
University of Kentucky — 2010 – 2013
Outstanding Psychology Graduate
Bellarmine University — 2010
Psi Chi Inductee
Bellarmine University — 2010
Psych Bowl Champions, Kentucky Psychological Association
Bellarmine University — 2010
Mary Agnes Dugan Clayton Scholarship Recipient
Bellarmine University — 2006 – 2010

PROFESSIONAL MEMBERSHIPS

Bluegrass Area Neuropsychology Group (BANG) — 2010 – Present
Kentucky Psychological Association (KPA) — 2008 – Present
American Psychological Association (APA) — 2009 – 2010

CERTIFICATIONS

Coma Recovery Scale-Revised (CRS-R) — 2012 – Present