

FEIGNING ADHD: EFFECTIVENESS OF SELECTED ASSESSMENT TOOLS IN  
DISTINGUISHING GENUINE FROM SIMULATED ADHD

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Research indicates that some college students may be strongly motivated to feign ADHD symptoms for desired external incentives, such as stimulant medication or academic accommodations. To date, literature examining feigned ADHD has been primarily focused on ADHD specific self-report measures (e.g., CAARS) and continuous performance tests (e.g., CPTs); however, little attention has been devoted to the use of multi-scale inventories in detecting feigned ADHD. For CPT measures, virtually no literature exists on the effectiveness of the TOVA to identify feigned ADHD, despite its frequent clinical use for establishing this diagnosis. The current study utilized a between-subjects simulation design to validate feigning cut scores on ADHD-specific measures using 66 feigners and 51 confirmed ADHD cases. As prior literature suggested, the results convincingly demonstrated that face-valid ADHD assessment measures were easily faked. Across both TOVA modalities (e.g., Auditory and Visual), the ADHD simulators performed significantly poorer than those diagnosed with ADHD. As an innovative approach, a Dissimulation-ADHD (Ds-ADHD) scale was developed and initially validated. The Ds-ADHD is composed of ten MMPI-2-RF items mistakenly believed to be clinical characteristics associated with ADHD. Requiring cross-validation, Ds-ADHD optimized cut scores and classification of ADHD feigners appears promising. They were clearly distinguishable from ADHD client, as well as those feigning general psychopathology. Recommendations for the utilization of the Ds-ADHD scale, and future directions for research are discussed.

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## CHAPTER 1

### INTRODUCTION

Individuals from college and the community may intentionally feign or exaggerate symptoms of Attention Deficit Hyperactivity Disorder (ADHD) to gain access to academic benefits and stimulant medications (Harp, Jasinski, Shandera-Ochsner, Mason, & Berry, 2011). These fraudulent claims, frequently occurring on college campuses, cause considerable burdens, financial and otherwise, for our society. For example, university staff as well as mental health professionals may devote unwarranted time and accommodations or provide nonessential medication to students that do not need these resources (Harrison, 2006; Jachimowitz & Geiselman, 2004). More generally, persons feigning ADHD, who may remain undetected, are responsible for the unwarranted taxing of limited health care resources (e.g., mental health professionals' time). If not assessed accurately, these fraudulent acts may also lead to unintentional, passive support of potential drug abuse and drug trafficking on college campuses. Further, feigned ADHD places an unfair disadvantage on students who do not feign and therefore do not receive academic accommodations. Lastly, undetected feigned ADHD may contribute to a potential decrease in the public's confidence in the effectiveness of psychologists and other health care providers.

Given the far-reaching societal consequences of feigned ADHD, it is an important priority both to develop a fuller understanding of how ADHD is feigned successfully and to develop detection strategies to identify feigned cases. In particular, the current dissertation addresses the effectiveness of ADHD-specific instruments in distinguishing (a) feigned from genuine ADHD, as well as the differentiation of (b) feigned ADHD from feigning of general psychopathology. On the latter issue, this dissertation developed a

feigned ADHD scale on a multiscale inventory (i.e., MMPI-2-RF; Ben-Porath & Tellegen, 2008/2011).

The introduction chapter of this dissertation is parceled into two main sections: ADHD and malingering. The first section begins with a broad overview of ADHD and its recent diagnostic changes. It evaluates research on various types of ADHD assessments (e.g., self-report, corroborative, and continuous performance tests). Finally, it considers how individuals may be motivated to feign ADHD for an external gain (e.g., malingering). The second major section introduces malingering and its various contrasting models (e.g., criminological, pathogenic, and adaptational perspectives). Prior research regarding feigned ADHD is organized based on research methodology (e.g., known-groups design versus simulation design) and analyzed for its effectiveness. Questions arising from this review set the stage for the current study and its objectives.

### Attention Deficit Hyperactivity Disorder

Attention Deficit Hyperactivity Disorder (ADHD) is classified by the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5; American Psychiatric Association, 2013) as a neurodevelopmental disorder in which individuals experience inattention, disorganization, and/or hyperactivity and impulsivity. According to the manual, ADHD “often persists into adulthood, with resultant impairments in social, academic and occupational functioning” (p. 32). Academically, a small but appreciable number of undergraduate students may be highly motivated to seek a diagnosis of ADHD, given the abundance of accommodations and other incentives offered to these students (Harrison, 2006). Specifically, stimulant drug prescriptions and classroom test



accommodations provide significant motivation for students to feign symptoms of ADHD (McGuire, 1998).

Since the mid-1990s, researchers have consistently documented a steady increase in diagnoses of ADHD in American children (McCabe, Teter, & Boyd, 2004; Rushton & Whitmire, 2001). Although the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2013) only estimates approximately 5.0% of children have ADHD, epidemiological studies suggest substantially higher percentages are found in community samples (Bird, 2002; Faraone, Sergeant, Gillberg, & Biederman, 2003). For example, The Center for Disease Control and Prevention (CDC; 2013) reported the prevalence rates for ADHD varied dramatically across the country from a low of 5.6% in Nevada to a high of 14.8% of children in Kentucky, with a national mean of 8.8%. A second national survey (e.g., Visser et al., 2014) concluded that approximately 11.0% of youth (ages 4 to 17) had received an ADHD diagnosis as of 2011. Of particular note, Visser et al. also observed an increasing linear trend in childhood ADHD: 7.8% in 2003, 9.5% in 2007, and 11.0% in 2011. As a parallel finding, the CDC (2013) observed that ADHD diagnoses increased at an average rate of 3.0% per year from 1997 to 2006.

Initially, Attention Deficit Hyperactivity Disorder (ADHD) was believed to affect only the pediatric population (McCabe et al., 2004); however, a series of longitudinal studies suggests anywhere from 30.0 to 70.0% of children with ADHD continue to display symptoms as adults (Barkley, Fischer, Edelbrock, & Smallish, 1990; Biederman et al., 1996; Gittelman, Mannuzza, Shenker, & Bonagura, 1985; Greenberg, 1994; Hunt, 1997; Klein & Mannuzza, 1991; Wender, 1995). Interestingly, a more recent study

conducted via the National Comorbidity Survey Replication (Kessler et al., 2005b) estimated the prevalence of current adult ADHD at only 4.4%. However, this anomalous finding may be due to a relatively small response rate ( $n = 154$ ) and the sole reliance on the ASRS (Adult ADHD Self-Report Scale; Kessler et al., 2005a) to diagnose ADHD. In addition, this study was conducted using the DSM-IV-TR (APA, 2000). Because the DSM-5 (APA, 2013) has adopted less stringent criteria, the prevalence rates of adult ADHD are likely to increase, as discussed in the next section.

The high base rate at which individuals in the general community report ADHD symptoms presents one hurdle in obtaining an accurate prevalence rate. Epidemiological research suggests only 1.0 to 5.0% of adults are formally diagnosed with ADHD (DuPaul et al., 2001); yet, much larger percentages reported current ADHD symptoms (22.0%) and childhood ADHD symptoms (56.0%) as occurring “often or very often” (Murphy & Barkley, 1996).

The observed trend of high percentages of reported ADHD symptoms extends to nonclinical undergraduate samples. For example, Weyandt, Linterman, and Rice (1995) found 8.0% of undergraduates claimed they experienced current ADHD symptoms; whereas Heiligenstein, Conyers, Berns, Miller, and Smith (1998) reported 11.0%. As a startling contrast, Du Paul et al.’s (2001) research found much higher (more than double) symptom endorsement rates, with 27.4% of males and 24.6% of females claiming ADHD symptoms. The remarkable variability in estimates may be reflective of how the various researchers operationalized ADHD symptoms as well as the measures they used to assess those symptoms. For example, DuPaul et al. (2001) administered a 24-item questionnaire (the Young Adult Rating Scale; DuPaul et al., 2001) and

considered symptoms to be significant only if the item was scored as a “two” (often) or “three” (very often) on a three-point Likert-type scale. In contrast, Heiligenstein et al. (1998) utilized the ADHD Rating Scale (ARS; DuPaul, 1991), while maintaining a similar decision point for significant ADHD symptoms (e.g., only those endorsed as “often” or “very often”). As a third approach, Weyandt et al. (1995) also administered the ARS, but unlike other studies (e.g., DuPaul et al., 2001; Heiligenstein et al., 1998), they also included the Wender Utah Rating Scale (WURS; Ward, Wender, & Reimherr, 1993) to examine early ADHD history.

In line with community and college studies, clinical research also suggests the number of adults presenting with ADHD symptoms is dramatically increasing (Hagar & Goldstein, 2005). This growing trend is observed in college and university students as well (Learning Opportunities Task Force, 2002). Notably, prevalence rates of ADHD are highly dependent on diagnostic criteria. With the recent relaxation of standards in the diagnostic criteria (e.g., age of onset increased from seven to 12-years-old) for an ADHD diagnosis, clients receiving mental health services are more likely to receive the diagnosis. The next section highlights the changes in ADHD and its classification by the DSM-5 (APA, 2013).

#### ADHD and the DSM-5

The Diagnostic and Statistical Manual (DSM-5; APA, 2013) serves as the official nomenclature used by researchers and mental health professionals to diagnose mental disorders. The DSM-5 establishes the diagnostic criteria for disorders, such as ADHD. It also provides information regarding differential diagnoses, ages of onset for various disorders, as well as the known etiology of some disorders. Since it was first published

in 1952, the DSM has evolved from the original DSM to the current DSM-5, reflecting the most recent information regarding diagnoses.

From a historical perspective, the original DSM (APA, 1952) failed to include any classification for attentional disorders. However, the second edition (DSM-II; APA, 1968) included the Hyperkinetic Reaction of Childhood Disorder, which was characterized primarily by symptoms of hyperactivity. As the evolution continued, the third edition (DSM-III; APA, 1980) became more specific and labeled the disorder Attention Deficit Disorder (ADD). DSM-III also added more inattentive symptoms plus subcategories based on the presence or absence of hyperactivity. With the third edition's revision (DSM-III-R; APA, 1987), the diagnostic criteria were maintained, but "undifferentiated ADD" was implemented for cases that were difficult to classify.

The next two editions (DSM-IV; APA, 1994 and DSM-IV-TR; APA, 2000) once again changed the name of the disorder to Attention Deficit Hyperactivity Disorder. Additionally, three specific subtypes were included (e.g., primarily inattentive, primarily hyperactive, or combined subtypes). Most recently, the latest version (DSM-5; APA, 2013) was published, creating an enthusiastic scholarly debate, as well as a public controversy described later in this section.

As a general introduction, the release of the DSM-5 was highly controversial (Frances & Widiger, 2012) because criteria for many disorders (including ADHD) were dramatically shifted. For example, Autism and Post Traumatic Stress Disorder (PTSD) both experienced major shifts in diagnostic criteria and classification (Frazier et al., 2012; Resick et al., 2012). The professional debate surrounding diagnostic standards also extended to ADHD classification (Coghill & Seth, 2011). While most ADHD criteria

in the DSM-5 are similar to DSM-IV-TR, a few fundamental changes have potentially produced far-reaching consequences, as strongly expressed by its critics. Before discussing these criticisms, a brief summary of DSM-5 diagnostic criteria is presented.

For DSM-5, a total of 18 symptoms are used to classify ADHD, paralleling the DSM-IV-TR (APA, 2000). Like the DSM-IV-TR, these symptoms are separated into two general domains: (a) inattention and (b) hyperactivity/impulsivity (see Table 1). An examinee needs several symptoms in at least one domain to receive an ADHD diagnosis. To avoid situation-specific criteria, the ADHD symptoms must be present in two or more settings (e.g., school and home). Further, symptoms must have sufficient severity as to impair social, academic, or occupational functioning. As exclusion criteria, these symptoms cannot occur exclusively during the course of schizophrenia or another psychotic disorder, or be better explained by another mental disorder.

The expansion of ADHD diagnoses is observed in two additional DSM-5 codes for individuals who do not meet requirements for the inattentive or hyperactive-impulsive categories. When individuals experience symptoms of ADHD that cause significant impairment in their functioning, yet they do not meet the full criteria, they are given a diagnosis of Other Specified Attention Deficit Hyperactivity Disorder. When this code is given, the reason for failing to meet full criteria for ADHD is specified. When unable to provide this reason, clinicians diagnose the individual with Unspecified Attention Deficit Hyperactivity Disorder (APA, 2013).

Despite general agreement on these basic ADHD criteria, other alterations have sparked a lively debate (see Bastra & Frances, 2012; Prosser & Reid, 2013; and Sibley, Waxmonsky, Robb, & Pelham, 2013). Several substantive DSM-5 changes pertain to

the extension of ADHD past childhood and into adulthood, likely in response to research calling for this expansion (Faraone, Biederman, & Mick, 2005; McGough & Barkley, 2004). In addition to ADHD being considered an adult disorder, onset, subtypes, and even the classification of the disorder have been modified. The five major differences between DSM versions are summarized in Table 2.

Table 1

*DSM-5 Diagnostic Criteria for Attention Deficit Hyperactivity Disorder*

Inattention Domain
Fails to give close attention to details or makes careless mistakes
Difficulty sustaining attention in tasks or play activities
Does not seem to listen when spoken to directly
Does not follow through on instructions and fails to finish schoolwork, chores, or duties in workplace
Difficulty organizing tasks and activities
Avoids, dislikes, or is reluctant to engage in tasks requiring sustained mental effort
Loses things necessary for tasks or activities
Easily distracted by extraneous stimuli *
Forgetful in daily activities
Hyperactivity/Impulsivity Domain
Fidgets with or taps hands or feet or squirms in seat
Leaves seat in situations when remaining seated is expected
Runs about or climbs in situations where it is inappropriate *
Unable to play or engage in leisure activities quietly
On the go, acting as if driven by a motor
Talks excessively
Blurts out an answer before the question is completed
Difficulty waiting for his or her turn
Interrupts or intrudes on others *

*Note.* \* Indicates specific examples provided for children that may not be readily apparent in adolescents or adults (DSM-5; APA, 2013). For example, children with ADHD may be seen running or climbing in inappropriate situations, whereas adolescents or adults may have an internal sensation of feeling restless without acting inappropriately in their contexts.

The most sweeping amendment involves the re-categorization of ADHD as a Neurodevelopmental Disorder. Previously, ADHD and Learning Disorders (LD) were clustered under “Disorders First Diagnosed in Infancy, Childhood, or Adolescence” and were grouped in the same category as Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD). This fundamental shift highlights a growing understanding of ADHD impairments as encompassing both cognitive and behavioral difficulties (Coghill & Seth, 2011). This change is likely not sufficiently dramatic to decrease identification in adults, as its previous classification was one of childhood disorders (Tannock, 2013). Generally, this transition appears to be less controversial than the others.

As a major point of contention, the DSM-5 reduces the ADHD diagnostic threshold for adults from six to five symptoms. This loosening of standards is intended to reflect age-related decline in symptoms, despite persistent impairment (Faraone et al., 2005). Therefore, one intended aim of the DSM-5’s ADHD and Disruptive Behavior Disorders Committee was to convey the pervasiveness of the disorder into adulthood (Coghill & Seth, 2011).

Table 2

*Changes in Attention Deficit Hyperactivity Disorder Diagnosis from the DSM-IV-TR to the DSM-5*

	DSM-IV-TR	DSM-5
1. Classification	Classified as a diagnosis usually first made in infancy, childhood, or adolescence	Classified as a neurodevelopmental disorder
2. Diagnostic Threshold	6 symptoms in either domains needed for diagnosis	Only 5 symptoms in either domain needed for diagnosis
3. Onset Criterion	Symptoms causing impairment need to be present before 7 years of age	Several inattentive or hyperactive-impulsive symptoms being present before 12 years of age
4. Subtypes vs. Specifiers	Subtypes	Specifiers that map directly to prior subtypes
5. Comorbid Diagnosis	ADHD precluded autism spectrum disorder	Autism spectrum disorder may co-occur

*Note.* DSM-IV-TR = Diagnostic and Statistical Manual Fourth Edition Text Revision (American Psychological Association, 2000); DSM-5 = Diagnostic and Statistical Manual Fifth Edition (American Psychological Association, 2013).

Favoring the DSM-5 reduction, several researchers (Faraone et al., 2006; Solanto, Marks, Wasserstein, & Mitchell, 2011) believe this will decrease the number of false-negative ADHD diagnoses. They argue adults that previously did not meet the symptom threshold but who still experience impairment will now be provided with the diagnosis and therefore eligible for accommodations, etc. In contrast, other investigators (Barkley, Murphy, & Fischer, 2008) argue decreasing the inclusion criteria may dramatically increase the number of false-positive ADHD diagnoses. For example, Barkley et al. (2008) found decreasing the symptom threshold from six to five increased the false-positive rate tremendously from 1.0% to 65.0%. This finding is particularly



concerning given the propensity for some examinees to exaggerate their symptoms (Wilens et al., 2008), a topic which will be discussed in detail in the coming sections.

The DSM-5 ADHD age of onset was increased from seven to 12-years-old after a systematic literature review failed to support the use of age seven as a maximum age (Kieling et al., 2010). Setting the age at 12 was bolstered by Kessler et al. (2005b), who found 95.0% of adults with ADHD diagnoses recalled their symptoms as starting before this age. As further support, Polanczyk et al. (2010) concluded that setting the age of onset at 12 would not substantially increase prevalence rates of ADHD diagnoses. As a counter point, Frances (2010, June) offered a stinging critique of Kieling et al.'s (2010) findings, arguing they focused solely on the benefit of reducing false negatives. He warned raising the age of onset to 12 might “result in a flood of new false positives for a diagnosis that may already be quite overinclusive” (p. 718).

The shift from subtypes to specifiers in the DSM-5 appears to be a less controversial alteration reflecting a compromise between clinical practice and empirical research. The DSM-5 (APA, 2013) scuttled the three DSM-IV-TR (APA, 2000) subtypes (i.e., combined type, predominantly inattentive type, and predominantly hyperactive-impulsive type) in favor of specifiers. Specifiers are diagnosed based on the individual's prominent symptom pattern for the past six months. Strong empirical evidence (e.g., Willcutt et al., 2012) argued against preserving the DSM-IV subtypes in DSM-5; however, clinicians continually reported the “inattentive subtype” as a common diagnosis. Therefore, in an effort to reach middle ground, the work group recommended and ultimately implemented specifiers.

Beyond the scholarly debate, the changes in ADHD criteria in the DSM-5 sparked public debate. For example, a DSM-5 critic and prominent psychiatrist, Allen Frances, accused the APA of “medicaliz[ing] normality,” which could “result in a glut of unnecessary and harmful drug prescriptions” in the *New York Times* editorial (Frances, 2012a, para 9). In addition, Frances (2012b) posted in the *Psychology Today* blog, listing the “ten worst changes” to adult ADHD in the DSM-5; he stated they earned the title of worst because they encourage unnecessary psychiatric prescriptions of medically contra-indicated stimulants.

Overall, these fundamental alterations from the DSM-IV-TR to the DSM-5 can be summarized as a broadening of the inclusion and exclusion criteria. As a specific result, ADHD diagnoses may be more easily feigned on specific ADHD instruments, for reasons discussed below.

#### ADHD Assessments

According to Young (2000), a marked and growing disparity is underscored between (a) the limited and traditional assessment methods, and (b) the increasing demand for sophisticated evaluations. This disparity, likely the result of several unique factors, must be considered in the assessment and diagnosis of ADHD. The following paragraphs outline four factors that contribute to the gap between clinicians’ methods of assessment and the growing need for accurate diagnoses. These factors include: (a) limited understanding of adult ADHD clinical presentations, (b) the longitudinal nature of assessing adult ADHD, (c) the complexity of assessing behavioral and cognitive adult ADHD symptoms, and (d) the lack of an agreement regarding which psychological measures most accurately diagnose adult ADHD. These four issues will be addressed sequentially in the next paragraphs.

Firstly, assessment practices may be progressing slowly due to a lack of knowledge regarding the clinical presentation and assessment of ADHD in adults (Glutting, Monaghan, Adams, & Sheslow, 2002). As noted earlier, this disorder has long been primarily conceptualized as affecting young children, and only recently have researchers begun investigating how it manifests in adult populations, a key first step in obtaining an accurate diagnosis (Weiss & Hechtman, 1986). Indeed, the criteria set forth in previous DSM versions were determined by extant literature, composed mostly of field trials with children (Frick et al., 1994; Lahey et al., 1994), with limited applicability to adults (Feinberg, 2000).

Secondly, current DSM criteria include a history of ADHD symptoms present in childhood, making evaluations longitudinal in nature. This longitudinal component of adult ADHD assessments creates a substantial reliance on individuals' abilities to accurately recall behavioral and cognitive difficulties from many years before (Shaffer, 1994). This observation holds true whether the person recalling information is the client seeking the assessment or a third party observer (e.g., elementary school teacher). Clinicians can strive to obtain school records that may confirm or deny these symptoms, but this information is often no longer available or limited in its helpfulness (Kooij et al., 2008). Specifically, internal cognitive difficulties associated with ADHD may be reported by the individual seeking the assessment, but would have likely not been directly observed by a parent or teacher. Obviously, the behavioral symptoms of ADHD (e.g., fidgeting) are far easier to observe.

The third challenge of assessing adult ADHD is the complexity of evaluating both cognitive and behavioral domains with the disorder. How ADHD symptoms are

expressed in these domains can vary by age, further complicating the assessment process. For example, Smith and Johnson (1998) found four specific symptoms to be most sensitive to detecting adult ADHD: (a) interrupting or intruding on others, (b) difficulty waiting in lines, (c) problems engaging in leisure activities quietly, and (d) blurting out answers. Conversely, Cumba-Aviles and Bauermeister (2002) found childhood ADHD symptoms warranting a diagnosis to be substantially different: (a) inability to sustain attention, (b) difficulty remaining seated, (c) moving around excessively, (d) problems engaging in leisure activities quietly, (e) fidgets or squirms in seat, and (f) feelings of being “on the go.” Clearly, children with ADHD appear to exhibit more symptoms from the hyperactivity or behavioral domain than adults (Riccio, Wolfe, Davis, Romine, George, & Lee, 2005). Although adults may more often receive predominantly inattentive specifiers, assessing multiple domains for a single diagnosis still remains a more complex task than assessing a purely cognitive or purely behavioral disorder.

A fourth challenge is the lack of gold-standard diagnostic tests for adult ADHD (Booksh, Pella, Singh, & Gouvier, 2010). Prominent scholars and professional organizations present widely divergent views of what constitutes adequate to exemplary ADHD assessments. Previously, experts encouraged psychologists (e.g., McGough & Barkley, 2004) and psychiatrists to base their diagnoses of ADHD on clinical interviews and self-report data alone. Although some researchers argue a clinical interview remains the cornerstone of accurate diagnosis (Adler & Cohen, 2004), the shortcomings of clinicians’ interviews are becoming well known (Wiesner & Cronshaw, 1988; Wright, Lichtenfels, & Pursell, 1989). With regard to ADHD, the practice of solely interview-

based diagnoses limits the comprehensiveness of the assessment by omitting third party sources and standardized test data. Moreover, this over-reliance on a single method may further allow for potential manipulation of the clinician by an examinee seeking external gain (e.g., malingering to obtain stimulant medication).

Omitting important information from third party observers (e.g., teachers or coworkers) places an undue responsibility on the individual presenting for the evaluation. Recognizing this limitation, more recent clinical guidelines (American Psychiatric Association, 2013; National Institute for Health and Clinical Evidence, 2008) consistently recommend that collateral reports should be obtained and considered during the diagnostic formulation of ADHD. It is also suggested that examiners utilize standardized diagnostic tools (e.g., clinical interviews, self-report data, and collaborative data) in conducting thorough and accurate adult ADHD assessments.

Neuropsychological testing is sometimes recommended to standardize ADHD evaluations and potentially increase their validity. Neuropsychological researchers (e.g., Barkley & Grodzinsky, 1994; Hervey, Epstein, & Curry, 2004; Schoechlin & Engel, 2005) have consistently demonstrated that adults with ADHD exhibit general deficits on executive functioning, processing speed, memory, and sustained attention tasks. However, no pattern of impairment on specific tests has been established as the most effective battery for identifying adult ADHD (Heiligenstein et al., 1998). The sections below briefly describe classifications of the most commonly used measures in the assessment of ADHD.

Self-report measures. Childhood and adult assessments of ADHD often differ substantially in access to collateral resources and accuracy of self-reported symptoms.

Diagnosing ADHD in children typically involves an assessment battery including information from multiple sources (Fisher & Watkins, 2008). However, in the assessment of adult ADHD, the documentation of symptoms is generally minimized (DeQuiros & Kinsbourne, 2001). For example, adults' school records are often no longer available for collateral information. Similarly, adult clients are typically unaccompanied, with no collateral source to confirm childhood symptoms. Therefore, clinicians place a high importance on adults' self-reporting in making diagnostic decisions (Fisher & Watkins, 2008).

An important longitudinal study by Mannuzza, Klein, Klein, Bessler, and Shrout (2002) has clearly shown a marked lack of stability and accuracy in using only self-reports for ADHD assessments. Their 16-year follow-up examined adults diagnosed with ADHD in childhood (based on strict research criteria) and adults with no childhood ADHD symptoms. Both groups were administered a structured clinical interview by examiners masked to their diagnosis status. Surprisingly, nearly one-third (32.0%) of childhood ADHD symptoms (e.g., acting before thinking, etc.) were rated as clinically significant by 20.0% of the non-ADHD participants. Further, 11.0% of non-ADHD participants were misdiagnosed with adult ADHD based on their retrospective self-reported symptoms, even after being stringently screened for the complete absence of ADHD in childhood.

Despite these problematic findings, self-report assessments are very commonly used in adult ADHD evaluations (Murphy, Gordon, & Barkley, 2000) because of their simplicity and availability. However, the DSM-5 cautions, "Adult recall of childhood symptoms tends to be unreliable, and it is beneficial to obtain ancillary information"

(APA, 2013, p. 61). Therefore, adult self-reports of childhood ADHD symptoms appear particularly problematic when used as the sole source of diagnostic information. This limitation was openly acknowledged by authors of the Conners' Adult ADHD Rating Scale whose technical manual (Conners, Erhardt, & Sparrow, 1999) states, "The test user should know that the CAARS are not intended to be the only sources of information in a clinical assessment. The CAARS are not a substitute for a complete clinical assessment that utilizes multiple sources of information" (p. 4). Despite cautions like the one above, clinicians may weigh results from self-reports heavily in adult ADHD assessments, whether they are given as the sole test in an evaluation or in combination with other assessment tools. See Appendix A for a list of commonly administered ADHD assessment instruments.

One major oversight of ADHD self-report measures is the lack of response style considerations in their psychometric development. However, this limitation may be overlooked by clinicians, as they consider the advantages of self-report measures. The major advantage is the standardized ratings of an individual's symptom severity. Additionally, self-reports typically utilize very little professional resources.

The face validity of ADHD symptom self-reports makes these instruments especially easy to exaggerate (Quinn, 2003). For example, the CAARS (Conners, Erhardt, & Sparrow, 1998) includes transparent items commonly known to be associated with ADHD such as "I can't sit still for very long" or "I have trouble keeping my attention focused when working." The same point holds true for measures assessing ADHD symptoms retrospectively. For example, the Wender Utah Rating Scale (WURS; Ward et al., 1993) includes easily identifiable ADHD items such as

“concentration problems, easily distracted.” These items and their scales are predicated on the accuracy of recall as well as the motivation to be completely self-disclosing. The use of face-valid items presents a problem; as McFarland and Ryan (2000) point out, these measures are vulnerable to distortion, both intentional and accidental.

Empirical keying represents an alternative to face validity and has long been applied to personality assessment (Minnesota Multiphasic Personality Inventory – 2 Restructured Form; Ben-Porath & Tellegen, 2008/2011). In understanding the different methods, two basic strategies exist for item development: (a) clear and transparent symptoms (face validity), or (b) less clear content that is not automatically associated with specific symptoms (empirical keying). Clearly, the first approach was utilized by those developing self-report measures for adult ADHD. To further add to this predicament, ADHD measures are often “single targeted,” meaning every item is related to an ADHD symptom, making it especially easy for clients to readily identify how they should answer in order to receive an ADHD diagnosis. The “single targeted” approach varies from multiscale approaches which assess different patterns of psychopathology (e.g., the MMPI-2-RF; Ben-Porath & Tellegen, 2008/2011; the PAI; Morey, 2007).

McFarland, Ryan, and Ellis (2002) examined how various self-report instruments include properties such as the grouping of similar items and transparency that heighten their vulnerability to faking. However, these properties are typically researched in the context of personality measures, rather than behavior rating scales, such as those used for ADHD. Although the extent of instrument susceptibility to falsification is not fully known, research (Harrison, Edwards, & Parker, 2007) suggests ADHD scales show a high vulnerability to feigning.



Individuals motivated to feign ADHD can easily be inundated with readily available information about ADHD symptoms. For instance, most adult Americans already know ADHD symptoms due to television advertisements for ADHD medications and other media outlets such as popular press articles and easily accessed Internet information (Conti, 2004; Murphy, 1994). Single-targeted, face-valid instruments, in combination with commonly known ADHD symptoms, create a high probability of successfully feigning ADHD.

To address this issue, ADHD self-report measures should include validity indicators, but they are typically absent (Quinn, 2003). As an important exception, the CAARS-S:L (Conners et al., 1999) includes a measure of Response Inconsistency, which may be produced by “noncompliant or unmotivated respondents” (p. 51). While addressing inconsistencies, it does not address the crucial issue of overreporting. Building on the Response Inconsistency Scale, seminal research by Suhr, Buelow, and Riddle (2010) broke new ground by developing the Conners’ “Infrequency Index” (i.e., CII) for the Adult Attention Deficit Hyperactivity Rating Scale to measure feigned ADHD symptoms. In short, this index utilizes a rare-symptom strategy based on items infrequently endorsed in genuine ADHD samples ( $\leq 10.0\%$ ). These two efforts represent a methodological shift in ADHD test development in the right direction. A next major step may be developing an ADHD validity scale on more complex measures, such as multiscale inventories.

With the over-reliance on self-report measures, well-informed feigners could receive a diagnosis based on their exaggerated or fabricated ADHD symptoms because the validity of their responses was not systematically considered. In concluding this

section, practitioners have very few tools to assess feigned ADHD presentations and their effects on the diagnostic findings. However, as previously noted, clinicians may attempt to collect corroborative information to confirm the self-described impairment.

Corroborative measures. Barkley (2006) highlighted the importance of collaborative interviews (e.g., parents, teachers, etc.) in conjunction with laboratory testing, direct observation, and self-reports in diagnosing ADHD. The inclusion of corroborating measures in ADHD assessments is believed to help evaluate the accuracy of the impairment reported by the examinee, via information regarding their relevant symptoms and possible feigning. Corroborative information should be considered a requisite component of ADHD assessments, particularly when evaluating children, who may have difficulty providing accurate information about symptom frequency or severity (Achenback, McConaughy, & Howell, 1987; Wolraich et al., 2004). Thus, several ADHD measures include alternate forms or symptom checklists for use with several responders, often including teachers and parents of the child being evaluated. For example, the Brown Attention Deficit Disorder Scales (BAADS; Brown, 1996) contains both parent and teacher rating forms for corroborative information.

Standardized measures for collateral sources can be useful with adults being evaluated for ADHD given the retrospective nature of the symptoms in childhood (Shaffer, 1994). In addition, adults with genuine ADHD often have difficulty with self-reflection and self-evaluation. This challenge may lead to an underreporting or misreporting of ADHD symptoms (Barkley, 1997; Danckaerts, Heptinstall, Chadwick, & Taylor, 1999), which may potentially be corrected by other knowledgeable informants.

Corroborative information may assist in diagnosing patients in two chief ways: (a) confirming an individual's past or present behavior and (b) addressing an individual's unintentional or intentional distortion. In addressing the first point, Henry, Moffitt, Caspi, Langley, and Silva (1994) argued when self-recollections are compared to collateral reports by parents and teachers, the two correlate very poorly ( $r$ s from .04 to .12). To address the accuracy of these ratings, Henry et al. (1994) looked at various outcomes (e.g., impairment in major life activities, such as occupational or educational problems) and found greater support for the accuracy of parental reports rather than self-reports of ADHD symptoms. This finding holds true regardless of whether the child endorsed more or fewer symptoms than their parent. In comparing parent and teacher sources of information on childhood ADHD, Loweber, Green, and Lahey (1990) found teacher information to be more useful than parent information, at least in discriminating among subtypes (now called "specifiers") for childhood ADHD diagnoses.

Zucker, Morris, Ingram, Morris, and Bakeman (2002) examined agreement between self and other informant ADHD ratings for adults. They found moderate concordance between informants and examinees regarding their current symptoms as well as childhood symptoms ( $r = .55$  to  $.65$ ). These correlations indicate moderate agreement between self and collateral ratings on the same measures. In contrast, Murphy and Schachar (2000) utilized the DSM-IV Behavior Checklist and asked adults without an ADHD diagnosis, their parents, and their partners to rate their behavior. Interestingly, participants tended to report experiencing more symptoms and at greater intensity than did the informants. However, this difference was only significant for the retrospective accounts of ADHD symptoms experienced during childhood.

Psychologists evaluate examinees' symptoms and their severity by taking into account informants' reports. These clinicians may address examinees' unintentional and intentional distortions. With children, corroborative information often corrects for unintended inaccuracies, whether overstating or understating their symptoms. For adults, however, corroborative reports may also serve as indicators for intentional distortion of symptoms. In adult ADHD examinations, corroborative instruments are typically provided to roommates, spouses, or employers, who have frequent interactions with examinees and may be able to provide information regarding their impairment (Alexander & Liljequist, 2013). Despite these advantages, corroborative information also has important limitations, the largest being that the informant may simply not have accurate information. For example, a roommate may provide information directly contrary to the examinee's reported hyperactivity. This discrepancy could mean either the examinee is exaggerating or fabricating hyperactivity, or that the roommate has limited opportunities to observe hyperactive behavior (e.g., working night shifts). Thus, the informant may have a different perspective or inaccurate information pertaining to the roommate's hyperactivity.

Nonetheless, utilizing corroborative measures allows clinicians greater access to information the self-informant may have mistakenly left out, but may also provide information regarding the true intentions of the individual being evaluated. For example, if the corroborative responder (e.g., roommate) reports no impairment despite the self-report of the examinee, the clinician may wish to consider possible motivations for why the individual may be pursuing the evaluation (e.g., access to stimulant medication).

Even the combined use of self-report and collateral measures in ADHD evaluations may be insufficient in providing enough accurate information to accurately diagnose ADHD (Mannuzza, et al., 2002). Therefore, researchers have developed and tested continuous performance tests (CPTs) to assist in ADHD evaluations by presumably increasing the measure of objectivity of reported symptoms (Conners & MHS Staff, 2004).

Continuous Performance Tests. The DSM-5 classification of ADHD as a neurodevelopmental disorder may be partially reflective of observed deficits on the neuropsychological assessments used in evaluating ADHD. In particular, Continuous Performance Tests (CPTs), are utilized frequently in adult ADHD examinations, as measures of sustained attention in the presence of potential distracters. Unlike the self-reports subjectively involved in symptom endorsement, CPTs measure impairment objectively, utilizing variables such as response time (Conners, 2004). CPTs expose an examinee to a largely repetitive task requiring continuous focus. Typically, this task is accomplished by assigning the individual a task on a computer, such as to click a button every time they see a designated target, like an “X,” but under no other circumstances (Leark, Greenberg, Kindschi, Dupuy, & Hughes, 2007). Over the course of 20 to 40 minutes, the individual will be assessed at how well they are able to accomplish that task. This method also evaluates the examinee based on their response time (e.g., intervals in milliseconds between the “X” flashing on the screen and the examinee’s response), correctly identifying the target’s absence (e.g., not responding when the “X” is absent), and not misidentifying distracters (e.g., responding when “A” flashes on the screen) (Greenberg, Kindschi, Dupuy, & Corman, 1996).

The major strength of these CPT measures is their objective assessments of attentional control, behavioral response (e.g., sustained attention or vigilance), perceptual discrimination, and response inhibition. Despite these advantages, some debate has transpired regarding the constructs that CPTs claim to measure (see Epstein, et al., 2003 for a review). For example, CPTs were initially developed to examine the performance of radar operators (Mackworth & Taylor, 1963), and it was much later that researchers began investigating their abilities to detect neuropsychological performance deficits. Given their initial purpose, these instruments were designed for repetitive use in a sterile (i.e., non-distractive) environment; however, it is unclear whether completing an intensely boring task for a brief period (less than 30 minutes, typically) is comparable to measuring inattention and hyperactivity in an environment filled with competing stimuli (e.g., a classroom).

Today, CPTs are widely administered both as research and clinical tools often included in ADHD assessment batteries (Conners, 1985; Greenberg & Waldman, 1993; Klee & Garfinkel, 1983). The demonstrated utility of CPTs among ADHD populations primarily relies on their ability to differentiate between ADHD and non-clinical groups. However, differential diagnoses (e.g., ADHD vs. pure impulsivity) have yet to be investigated. Focusing on ADHD, the link between CPTs and actual ADHD behaviors has not yet been solidly established. For example, CPT commission errors (i.e., responses in the absence of targets) have been conceptualized as reflecting an individual's impulsivity (Leark et al., 2007). In contrast, CPT errors of omission (i.e., missed responses to targets) are assumed to reflect symptoms of inattention (Klee & Garfinkel, 1983). Despite the intuitional appeal, empirical evidence attempting to confirm

these relationships has produced weak and conflicting results (Barkley, 1991). Thus, it remains somewhat unclear what, if any, behavioral symptoms of ADHD are directly related to the various components of CPTs.

Dozens of studies (see Nichols & Waschbusch, 2004 for a review) have evaluated the effectiveness of CPTs in diagnosing ADHD. Unfortunately, as previously noted, most studies compared an ADHD positive group with a “normal” group, which included individuals with presumably no psychological difficulties. While these studies mostly supported the use of CPTs in distinguishing children and adults with ADHD from carefully selected normal individuals, they cannot provide critically important evidence supporting their utility in distinguishing persons with ADHD from individuals with other psychiatric diagnoses. Few studies (Hall, Halperin, Schwartz, & Newcorn, 1997; Preston, Fennell, & Bussing, 2005) used methodology to address this issue, such as near-neighbor comparisons of ADHD to general impulsivity or learning disability samples. For example, the impulsivity component of a CPT was found to successfully discriminate reading disability from ADHD in children, but the inattention component did not (Hall et al., 1997). According to the Carlat Psychiatry Report (2013), CPTs are unproven in their utility for diagnosing ADHD and a CPT “add[s] little value” to ADHD assessments. Still, these measures are frequently used in ADHD assessments. The two most commonly utilized CPTs for adult ADHD assessment include: the Conners’ Continuous Performance Test – II (CPT-II; Conners & MHS Staff, 2004) and the Test of Variables of Attention (TOVA; Greenberg et al., 1996).

## Motivations to Feign ADHD

Several researchers (DeSantis & Hane, 2010; Evans, Serpell, Schultz, & Pastor, 2007; Nichols, Harrison, McCloskey, & Weintraub, 2002) argue that obtaining stimulant medication and receiving academic accommodations are two prevailing motivations for adults to feign ADHD. For instance, individuals with ADHD and other learning disabilities are considered disabled, making them eligible to receive financial aid and academic support at their universities in accordance with the Americans with Disabilities Act of 1990 (ADA, 1990). Programs at the college level that assist students with ADHD in being academically successful include both classroom and out of the classroom assistance. For example, the classroom benefits sometimes provided for these students include separate proctoring of exams, additional time to complete exams, quiet testing areas, and volunteer note takers. Outside the classroom, these students may receive priority enrollment and housing, access to technology resource rooms, accommodations for degree-related internships, tutoring, and the possibility of meeting with instructors to review early drafts of assignments (UTD, 2000; UNT, 2010). Beyond academic advantages, disabled students with ADHD are frequently eligible for prescribed stimulant medications.

The number of individuals receiving stimulant medication is increasing at an alarming rate. Okie (2006) reported a 90.0% increase in number of American adults prescribed stimulant medication to treat ADHD over a three-year span from 2002 to 2005. Adderall (mixed salt amphetamine), Ritalin (Methylphenidate) and Dexedrine (dextroamphetamine) are among the most popular drugs prescribed to children and adults with ADHD. Despite efforts by the DEA to limit their availability to prescription use



only, the illegal use of ADHD stimulants has gained popularity since the 1990s, especially on college campuses (Babcock & Byrne, 2000; Hall, Irwin, Bowman, Frakenberger, & Jewett, 2005). To illustrate this point, DeSantis, Webb, and Noar (2008) conducted a survey of 1,811 students at a large public university and found 34.0% of their participants admitted to having used ADHD medication illegally on at least one occasion, while only 4.0% had been prescribed these medications. Illegal use of stimulant medications is sometimes justified by college students, who believe they are “doing it for the right reasons,” such as obtaining better grades (DeSantis & Hane, 2010). Despite the so-called “rightness” motivation, college students feigning ADHD in hopes of obtaining accommodations or medications should be classified as malingering.

### Malingering

Malingering is not considered to be a mental disorder, but rather a condition warranting clinical attention (V code). The DSM-5 (APA, 2013) defines malingering as “the intentional production of false or grossly exaggerated physical or psychological symptoms, motivated by external incentives such as avoiding military duty, avoiding work, obtaining financial compensation, evading criminal prosecution, or obtaining drugs” (p. 726). Typically, forensic psychologists, psychiatrists, and neuropsychologists constitute the mental health professionals who most often encounter malingering while conducting forensic evaluations. Malingering base rate estimates vary by setting, referral questions, and the stringency of the criterion used by researchers (e.g., probable malingering versus symptom exaggeration; see Rogers, 2008).

### Models of Malingering

The DSM-5’s definition of malingering remains largely unchanged from the prior editions. As noted by Berry and Nelson (2010), “the failure to update the criteria for

malingerers in DSM-5 ignores more than 30 years of empirical and theoretical work on the topic” (p. 296). Berry and Nelson called for revised criteria for DSM-5, but ultimately were denied these revisions. Problems raised with the DSM-5 malingering model were two-fold, both theoretical and practical. In theoretical terms, concerns pertain to the conceptualization of malingers as “bad” (Rogers, 1990). With regard to practical issues, the concern is about the difficulty of obtaining “intentionality” and the difficulty in distinguishing between externally versus internally motivated individuals.

From a theoretical perspective, the DSM-5’s criminological model must be distinguished from pathogenic and adaptational models (Rogers, Sewell, & Goldstein, 1994). The criminological model is starkly contrasted with other models in that it assumes the primary motivation for feigning is characterological. To address this theoretical issue and challenge the criminological lore, Rogers (1990) postulated an “adaptational” model of malingering. This alternative model suggests conceptualizing malingers as individuals acting with reason when facing adversarial circumstances with few perceived alternatives. It aims to avoid the criminological view of malingering by conceptualizing it in terms of a cost-benefit analysis. It is sharply contrasted with the “pathogenic” model, which assumes that malingers have a chronic and progressive mental disorder that their underlying motivations are attempting to control. This model predicts continued deterioration, which is not empirically supported (Rogers, 2008). Beyond theory, the practical issues, as raised by Berry and Nelson (2010), led to the development of Slick, Sherman, and Iverson’s (1999) Malingered Neurocognitive Dysfunction (MND) model.

The development of the MND model was first presented by Slick and his colleagues (Slick et al., 1999), as the malingering neuropsychological research and literature had grown rapidly in the preceding decade (Sweet, King, Malina, Bergman, & Simmons, 2002). Commonly referred to as the “Slick criteria” or MND model, this system of classification of feigned cognitive impairment has been widely accepted by the neuropsychological community. The Slick criteria aimed to provide “specific, unambiguous, and reliable criteria that cover all possible sources of evidence,” (p. 551). For the MND model, Slick et al. (1999) defined malingering as a “volitional exaggeration or fabrication of cognitive dysfunction for the purpose of obtaining substantial material gain, or avoiding or escaping formal duty or responsibility” (p. 552). Additionally, they offered three classifications of malingering based on likelihood: possible, probable, and definite MND. Each classification is based on three inclusion criteria: (a) an external incentive, (b) neuropsychological testing providing evidence of MND, and (c) discrepancies between self-report and medical, collaborative, or behavioral evidence. As an exclusion criterion, the presentation cannot be fully explained by a psychiatric, neurological, or developmental disorder.

Rogers, Bender, and Johnson (2011) produced a critical analysis of the Slick et al. (1999) model, highlighting four major limitations. First, they were concerned about the MND’s reliance on medical and psychiatric records, given the variability and often unreliability of these documents. Second Rogers et al. (2011) also critiqued the appropriateness of including external incentives in the model that are simply inferred rather than formally examined. Third, they argued the MND model has a potential malingering bias. Fourth, they observed large gaps in the MND research, leaving many

components completely unsubstantiated. Overall, Rogers et al. (2011) strongly questioned whether the model should be utilized in forensic or clinical settings. However, Boone (2011) responded to the Rogers et al. (2011) critique, concluding the authors “overstated the failings of the MND criteria” and advocated for its use in research and clinical settings (p. 157).

In summary, excellent progress has been made in the identification of malingering, despite the discord between academics regarding malingering models. Regardless of model, the literature often separates feigning into three general domains based on clinical presentation: (a) feigned psychiatric symptoms, (b) feigned cognitive/neuropsychological symptoms, and (c) feigned physical or somatic symptoms. Further, three useful research designs have been put forth for the validation of detection strategies in each of these domains: simulation design, known-groups comparisons, and bootstrapping comparisons (Rogers & Gillard, 2011).

### Malingering and ADHD

The assessment of feigned ADHD can be a particularly difficult challenge for mental health professionals. As noted, this challenge is partially due to the disorder’s span across the feigned psychiatric and feigned cognitive symptom categories. Despite its recent categorization as a neurodevelopmental disorder (APA, 2013), psychiatric symptoms (e.g., disorganization, inattention, etc.) remain important in ADHD diagnoses and are likely also targeted as symptoms to feign by those pursuing external incentives. From a neurocognitive functioning perspective, ADHD may be especially vulnerable to feigning. As Rogers (1997) noted, it is often easier to fake a behavioral deficit (e.g., lack of attention) by withholding normal behavior, than to convincingly fake positive

symptoms (e.g., auditory hallucinations), which requires individuals to produce new behaviors. In the case of ADHD, positive symptoms might include hyperactivity. However, unlike psychotic phenomena (e.g., auditory hallucinations), hyperactivity is likely easier to fake given general familiarity with this behavior.

Research on feigned ADHD has increased over the last two decades via two research designs that complement each other: simulation and known-groups design (Rogers & Gillard, 2011). Several researchers using a simulation design methodology have been able to compare genuine to simulated ADHD groups in clean studies controlling for many factors. Alternatively, the known-groups research design has provided valuable information regarding how individuals feigning ADHD of their own accord (i.e., not being asked to do so) respond on assessments. Of note, no bootstrapping research (e.g., use of questionable external criteria) on malingered ADHD was found in the literature search.

Encouragingly, scholars utilizing simulation and known-groups methodology to assess feigned ADHD have covered multiple areas of assessment including symptom report and validity indicators. For example, researchers have begun investigating the use of multi-scale inventories to detect dissimulated responses when faking ADHD (see Harp et al., 2011). In addition, more recent research has begun investigating the use of symptom validity measures to assess malingered ADHD (see Booksh et al., 2010; Frazier, Frazier, Busch, Kerwod, & Demaree, 2008). Because ADHD symptoms encompass neurocognitive deficits, researchers focusing on feigned ADHD often compare findings to those of other feigned neurocognitive impairment.

Detection of feigned neuropsychological and cognitive deficits has been most fully developed in the context of evaluating traumatic brain injury (TBI) patients seeking compensation. Larrabee (2007) and Boone (2007) provide valuable overviews of the effectiveness of symptom validity tests (SVTs) for detecting malingered TBI. Due to its general effectiveness, researchers have recently applied SVTs specifically to malingered ADHD. For organization, the relevant studies on malingering and ADHD are discussed separately in two sections based on methodology, simulation and known-groups design. In addition, Tables 3 and 4 include relevant studies and effect sizes between genuine ADHD, feigned ADHD, and control groups. The criteria for “known groups” are also listed in the tables to assist in navigation of the following sections.

Table 3  
Literature Review Studies for Feigned ADHD with Known-Groups Design

Author	Sample <sup>1</sup>	Known-Groups Criteria	N	Measures <sup>2</sup>	Relevant Subscales	$d_1$	$d_2$	$d_3$	ADHD vs. Feign, $p < .05$
Suhr et al. (2008)	UC	Failure of one or more of the first four subtests on the WMT	65	CAARS	ADHD Index	-0.49	-0.10	-0.33	No
Suhr et al. (2010)	U	Failure of one or more of the first four subtests on the WMT	124	WURS CAARS	Infrequency Index	-0.78 -	-0.88 -	0.00 -	No
Suhr et al. (2011)	C	Failure of two of the first four subtests on the WMT and lacking the General Memory Impairment Profile	101	C-CPT	Visual - # CPT Subscales Impaired	-	-	-0.73	Yes
				C-CPT	CPT Subscale Means				
					Omissions			-0.60	No
					Commissions			-0.63	No
					Reaction Time			-0.57	No
					Reaction Time Variability			-0.64	Yes
Sullivan et al. (2007)	U	Failure of one or more WMT subtests	67	PAI		-	-	-	No
				CAARS		-	-	-	

*Note.* ADHD vs. Feign = Comparing a genuine ADHD sample to a Feigning ADHD sample to determine if they were significantly different at  $p < .05$ . PAI = Personality Assessment Inventory; CAARS = Conners' Adult ADHD Rating Scale; WURS = Wender Utah Rating Scale; CPT = Conners' Continuous Performance Test.

<sup>1</sup>For samples, U = Undergraduate Students, C = Community Sample, UC = University Clinic Sample.

<sup>2</sup>Only self-report and CPT instruments were included in the table.

Several studies did not report enough information to calculate effect sizes or they did not include the groups this table addresses; therefore, the effect sizes are absent, as indicated by a dash.

$d_1$  = control versus ADHD;  $d_2$  = control versus feigning;  $d_3$  = ADHD versus feigning.

Known-Groups Studies. Two major research groups lead by Sullivan and Suhr have explored feigned ADHD via known-groups research studies. The groups have several methodological differences. In general the Suhr group has required a more stringent criteria for “known groups” than Sullivan. While both groups have studied feigned ADHD on self-report ADHD measures, the Sullivan group expanded this research to the PAI. In contrast, the Suhr group examined feigned ADHD on a continuous performance test, an attention-based measure. The following paragraphs will break down the relevant research findings of these two research programs.

Regarding known-groups criteria, most studies have determined feigning via the Word Memory Test (WMT; Green, 2005) in some capacity; however, criteria of feigning varies (e.g., fail one versus two or more subtests) by study. For this portion of the literature review, the following terms will be used for clarity: Partial Criterion (PC) indicates a group failing *one* or more WMT subtests, and Stringent Criterion (SC) indicates a group failing *two* or more WMT subtests.

In his dissertation study, Booksh (2005) became the first investigator to apply the WMT to feigned ADHD. Previously the WMT had been validated in a variety of clinical populations including psychiatric patients, disability claimants, and traumatic brain injury samples. According to Booksh, approximately 58.0% of the ADHD simulators were identified by having failed one or more of the WMT subtests. Although just over 40.0% of simulators were undetected, no members of the control or ADHD diagnosis groups were misidentified (e.g., no false positives).



Building on Booksh (2005), Sullivan, May, and Galbally (2007) published the first known-groups design study investigating feigned ADHD using the WMT and PC criteria. As is the common procedure in feigned ADHD known-groups studies, the authors utilized archival data of adult ADHD and learning disability (LD) assessments. Sullivan et al. (2007) classified 22.4% of their total sample as feigning. Importantly, almost half (47.6%) of the ADHD referrals failed the WMT, in contrast to only 15.4% of LD examinees and 9.4% of dual referrals (ADHD and LD). This finding appears to suggest a high proportion of students presenting for only ADHD evaluations may be feigning. Unfortunately, these researchers did not report sufficient data to calculate effect sizes.

As noted earlier, Sullivan et al. (2007) measured feigning on the PAI and a self-report ADHD measure, the CAARS. Importantly, Sullivan et al. (2007) did not include direct comparisons between the genuine and the PC approach, but rather they published correlations between failure on the WMT and performance on the CAARS and PAI. On the CAARS, the researchers found negative correlations between WMT scores and CAARS Index Scores ranging from  $-.41$  to  $-.66$ . This suggests individuals with poorer WMT scores reported higher severity of ADHD symptoms on the face-valid self-report measure.

With regard to performance on the multiscale inventory, results showed those in the PC group did not produce elevated validity indicator scores on the PAI. In fact, none of these participants produced an elevated NIM scale; the highest score was a 66, still well below the recommended cut score of 73 for clinical significance (Morey, 1991). Importantly, this finding is not particularly

surprising, given that the NIM scale was developed to detect an individual presenting themselves in an overly negative light, but not necessarily someone feigning the cognitive or behavioral symptoms of ADHD. The authors conclude the participants engaged in a selective effort to exaggerate symptomatology only consistent with ADHD, as only 2 of the 28 PC participants elevated any of the validity indicators with a *T* score greater than 70. This highlights the utility of a validity index like the CII on self-report ADHD specific measures. Unfortunately, the authors did not include any information regarding performance on the PAI clinical scales.

Suhr, Hammers, Dobbins-Buckland, Zimak, and Hughes (2008) adopted a more sophisticated design using the WMT to compare feigners (ADHD-Sim) to an ADHD confirmed (ADHD-Dx) and a non-ADHD clinical group (i.e., PSYC). In testing the CAARS, Suhr et al. (2008) found the instrument did not distinguish between any of the three groups except for on one scale measuring hyperactive-impulsive symptoms. Further, the significant difference was not between the ADHD-Dx and the PC group. Supporting Sullivan et al.'s (2007) findings, those in the PC group endorsed symptoms on the self-report measure at clinical levels, similarly to those actually diagnosed with ADHD, indicating the measure is fakable. Like findings from simulation research discussed in the next section, Suhr et al. (2008) found self-report measures (e.g., CAARS and WURS) lacking in discriminability between those with an ADHD diagnosis and those in the PC group (*ds* of 0.00 on the CAARS and 0.33 on the WURS). Those participants in

the PC group were also identifiable via other indices of feigning, which provided evidence in support of using multiple measures of feigning in ADHD evaluations.

The findings from these studies clearly demonstrated a need for validity indices on self-report ADHD measures. For this purpose, Suhr et al. (2010) conducted two known-groups studies. The first developed an Infrequency Index for the CAARS (i.e., CII), and the second validated the newly constructed index. These researchers classified individuals presenting for ADHD evaluations as feigning using the PC standard. These feigners (PC) were subsequently compared to similar ADHD and Psych groups that were utilized in the 2008 study. Results indicated utility for the CII in distinguishing those in the ADHD-Dx group from feigners; however, it could not distinguish between PC and the Psych group, who suffered from another mental disorder. The authors called for this index to be tested within a simulation design, one aim of the current study.

To strengthen the methodology, the Suhr research group (Suhr, Sullivan, & Rodriguez, 2011) utilized the Stringent Criterion (SC) design. They compared genuine versus feigned performances on the Conners' Continuous Performance Test (C-CPT). As hypothesized, the SC feigning group performed more poorly on several C-CPT subscales than did the psych group, but not significantly differently than the ADHD group, despite generally exhibiting moderate effect sizes. This unexpected finding varies from simulation studies, which generally find CPTs to be effective at distinguishing these groups. This difference may be the result of the stringent inclusion criteria in the Suhr et al. (2011) study. Interestingly, Suhr et al. (2011) found significant differences between the SC and

ADHD-Dx groups when examining the total number of subscales that fell into the “impaired range” for these individuals. Those in the SC group had significantly more subscales in the impaired range than did those in the ADHD-Dx group.

In summary, four important lessons have emerged from the Suhr and Sullivan studies. First, ADHD-specific, face-valid measures (e.g., CAARS, WURS, etc.) are unable to distinguish between genuine and feigned ADHD using partial criterion (PC) or stringent criterion (SC) for known-groups designation. Second, general validity indicators (e.g., the PAI’s NIM scale) do not appear useful in distinguishing feigned from genuine ADHD. Third, an ADHD feigning indicator (i.e., CII) shows promise. Fourth, CPTs may be useful in distinguishing feigned from genuine ADHD when taking into consideration the number of overall failed subscales. To address these issues, the authors of these known-groups studies stress the importance of using multiple validity indicators and a variety of instruments in assessing individuals presenting with concerns of ADHD.

Of note, the findings of the known-groups studies need to be examined with the type of methodology considered. One major limitation to reflect on in interpreting these results is that the authors failed to identify any external incentive for failure on tests. It is also important to remember that WMT was not developed to be used with individuals feigning ADHD and therefore, failure on the WMT does not necessarily constitute ADHD malingering.

Table 4  
Literature Review Studies for Feigned ADHD with Simulation Design

Author	Sample <sup>1</sup>	Groups <sup>2</sup>	N	Measures <sup>3</sup>	Relevant Subscales	<i>d</i> <sub>1</sub>	<i>d</i> <sub>2</sub>	<i>d</i> <sub>3</sub>	ADHD vs. Feign, <i>p</i> <.05	MC
Booksh et al. (2010)	U	ADHD-Dx; Non-ADHD; ADHD-Sim	110	C-CPT		-	-	-	Yes	Yes
				WURS		-1.14	-1.93	-0.55	No	
Fisher et al. (2008)	U	ADHD-Sim	189	ADHD Behavior Checklist		-	-	-	-	No
Harp et al. (2011)	U	ADHD-Dx; Non-ADHD; ADHD-Sim; ADHD-Ex	88	MMPI-2-RF	F-r	-0.42	-1.19	-0.77	Yes	Yes
					RC1	-0.56	-1.14	-0.61	Yes	
					CAARS	-1.39	-2.20	-0.62	No	
Harrison et al. (2007)	U	ADHD-Dx; Non-ADHD; ADHD-Sim	142	CAARS	ADHD Index	-0.99	-2.25	-0.83	Yes	Yes
Jachimowicz et al. (2004)	U	ADHD-Sim	80	CAARS		-	-	-	-	No
				WURS		-	-	-	-	
Jasinski et al. (2011)	U	ADHD-Dx; Non-ADHD; ADHD-Sim; ADHD-Ex	86	CAARS	DSM-IV: Total	-1.47	-2.60	-0.77	No	Yes

Table 4 (continued) Author	Sample	Groups	N	Measures	Relevant Subscales	$d_1$	$d_2$	$d_3$	ADHD vs. Feign, $p$ <.05	MC
Leark et al. (2002) <sup>3</sup> Sollman et al. (2010)	U	Non-ADHD; ADHD-Sim (within subjects)	36	TOVA	Visual- Total Score	-	1.33	-	Yes	No
	U	ADHD-Dx; Non- ADHD; ADHD- Sim	74	ARS	Total Current Symptoms	-2.81	-2.73	-0.30	No	Yes
				CAARS	M Scale T score	-3.06	-3.20	-0.30	No	
				C-CPT	% Clinical Agreement Index	-0.81	-1.21	-0.44	No	
Quinn (2003)	U	ADHD-Dx; Non- ADHD; ADHD- Sim	58	ADHD Behavior Checklist	Current Inattention Total Score	-2.37	-2.74	-0.62	No	Yes
					Current Hyperactivity Total Score	-2.08	-2.15	-0.20	No	
				Integrated Visual and Auditory CPT	Full Scale Attention Quotient Scores	1.07	3.90	1.96	Yes	

*Note.* MC = Manipulation Check; C-CPT = Conners Continuous Performance Test; WURS = Wender Utah Rating Scale; MMPI-2-RF = Minnesota Multiphasic Personality Inventory, Second Edition, Restructured Form; CAARS = Conners Adult ADHD Rating Scale; TOVA = Test of Variables of Attention; ARS = ADHD Rating Scale.

<sup>1</sup>U = Undergraduate Students, C = Community Sample, UC = University Clinic Sample.

<sup>2</sup>ADHD-Dx = Individuals diagnosed with ADHD answering honestly; Non-ADHD = Individuals without ADHD diagnoses answering honestly; ADHD-Sim = Individuals without ADHD diagnoses simulating ADHD; ADHD-Ex = Individuals with a diagnosis of ADHD that exaggerated their symptoms.

<sup>3</sup>Only self-report and CPT instruments were included in the table.

Several studies did not report enough information to calculate effect sizes or they did not include the groups this table addresses; therefore, the effect sizes are absent, as indicated by a dash.

$d_1$  = control versus ADHD;  $d_2$  = control versus feigning;  $d_3$  = ADHD versus feigning.

Simulation Studies. Simulation design studies have long been recognized as a sound methodological approach to studying feigning, and it has therefore been utilized in feigned ADHD research. A major strength of simulation design in studying feigned ADHD is the internal validity of this approach. The groups are clearly operationalized; however, the internal validity comes at the cost of external validity, as the applicability to “real world” practice is decreased. Despite this limitation, most studies examining feigned ADHD systematically utilize comparisons involving simulation, clinical-comparison, and control groups.

Quinn’s (2003) simulation study launched a small, but growing body of research regarding feigned ADHD. Quinn compared an ADHD feigning group (i.e., Non-ADHD undergraduates simulating ADHD) to both a clinical comparison sample (i.e., ADHD undergraduates) and a control group (i.e., Non-ADHD undergraduates responding honestly). First, the CPT findings will be compared and contrasted with other CPT findings in the literature, then the results pertaining to the self-report measure will be examined.

As Quinn predicted, the CPT in her study was able to easily discriminate between the three groups using the Full Scale Attention Quotient Scores of the Integrated Visual and Auditory Continuous Performance Test (Sandford & Turner, 1995). The ADHD-feigning group exhibited extremely large effect sizes when compared to the clinical comparison group ( $d = 1.96$ ). In contrast to these findings, Sollman, Ranseen, and Berry (2010) utilized the Conners’ Continuous Performance Test (C-CPT; Conners & MHS Staff, 2004) and found it discriminated between genuine and feigned ADHD on only three of the six indices. On all indices the feigning group produced worse

scores than the genuine ADHD group. Although similar to Quinn's results, the differences were not as pronounced. Sollman et al. (2010) concluded the C-CPT was "successfully faked" because the feigning group produced elevated scores, despite their recognition that the groups were statistically different on only approximately half of the indices.

Differences across studies could reflect dissimilar CPTs utilized, or the different factors in each simulation design study (i.e., presence or absence of coaching, feigning incentives, etc.). Booksh et al., (2010) also utilized the C-CPT and found it distinguished between feigned ADHD and genuine ADHD on the two indices they examined, even after a conservative Bonferroni correction was applied. These results suggest perhaps the lack of significance in the Sollman et al. (2010) article was due to factors other than the CPT instrument utilized.

Leark, Dixon, Hoffman, and Huynh (2002) produced the only other study to examine feigning ADHD on a CPT. Interestingly, these authors investigated feigned ADHD on the Test of Variables of Attention (TOVA; Greenberg et al., 1996). Unfortunately, their focus was on test order effects rather than detection of feigned ADHD. The methodology was a mixed between and within subjects design in which participants without ADHD were divided into one of two groups. The groups varied in that group one was asked to answer honestly and then "fake bad" on the TOVA, whereas group two was asked to "fake bad" and then to answer honestly. Although it was not the primary aim of their study, Leark et al.'s (2002) findings are still informative in that their results showed feigners produced "excessive amounts of omission and commission errors" (p. 335).



Simulation studies have found ADHD-specific self-report measures and symptom checklists are easily faked and often cannot discriminate between genuine and feigned ADHD. Quinn (2003) reported a significant difference between controls (Non-ADHD) and those with an ADHD diagnosis (ADHD-Dx) on the ADHD Behavior Checklist (Murphy & Barkley, 1996). She also found the instrument discriminated between Non-ADHD and those feigning ADHD (ADHD-Sim); however, the genuine ADHD (ADHD-Dx) and feigning ADHD (ADHD-Sim) groups were indistinguishable with  $d$ s ranging from -0.62 to -0.20. Also examining the ADHD Behavior Checklist, Fisher and Watkins (2008) found their simulator group (ADHD-Sim) produced profiles that would be characterized as “successful faking” (p. 86).

Booksh et al.’s (2010) results follow the trend seen in Quinn’s work wherein the WURS lacked discriminability between feigned and genuine ADHD, producing only a modest effect size ( $d = -0.55$ ). The authors concluded that simulators can fabricate symptoms to a similar degree as those genuinely diagnosed with the disorder, but not to such an exaggerated degree that they are differentiated from genuine protocols. This pattern was again observed in a study by Sollman et al. (2010). On all indices of the Conners' Adult ADHD Rating Scale (CAARS; Conners et al., 1999) and the ADHD Rating Scale (ARS; Barkley & Murphy, 2005), the genuine (ADHD-Dx) and feigned (ADHD-Sim) ADHD groups performed worse than those without ADHD, while producing statistically equivalent means to one another ( $d$ s ranging from -0.30 to -0.44). Essentially, the feigners produced protocols that were “virtually identical” (p. 329) to those with a genuine diagnosis of ADHD. In contrast, when comparing effect sizes of

controls versus ADHD-Dx ( $d$ s from -0.81 to -3.06) and controls versus ADHD-Sim ( $d$ s from -1.21 to -3.20), it is clear much larger discrepancies emerged.

In contrast to Quinn and Sollman et al.'s findings, Harrison et al. (2007) found somewhat disparate results. In comparing a control group (Non-ADHD) and a clinical group (ADHD-Dx) to a feigning group (ADHD-Sim) on the CAARS, they found the feigning group were successful in feigning symptoms of ADHD when using the cut-off scores suggested in the CAARS manual. However, they found the feigning group (ADHD-Sim) to perform significantly worse than the genuine groups (Non-ADHD and ADHD-Dx) on all but one of the subscales examined. Unlike their colleagues, Harrison et al. (2007) suggest feigners over exaggerate their symptoms to such a degree that they can be detected.

Two remaining studies produced by the same research group have inspected feigned ADHD on self-report measures. Importantly, these studies utilized a sophisticated research design to include controls (Non-ADHD), genuine ADHD participants (ADHD-Dx), and feigners (ADHD-Sim), like most other studies previously discussed. However, these researchers included a fourth group they call a "clinically enhanced simulation" group, which is comprised of individuals with a diagnosis of ADHD who are asked to exaggerate their impairment (ADHD-Ex). Jasinski, Harp, Berry, Shandera-Ochsner, Mason, and Ranseen (2011) examined group differences on the CAARS. Starkly contrasting Harrison et al.'s (2007) findings, Jasinski et al. (2011) found their feigning group (ADHD-Sim) failed to produce more elevated scores on the CAARS indices than ADHD-Dx and ADHD-Ex groups.

Likewise, Harp et al. (2011) used the same four groups with results generally falling in line with Jasinski et al.'s (2011) findings. Effect sizes from both studies was fairly consistent with the largest  $d$ s (-2.20 and -2.60) noted to be between controls and feigners, the second largest  $d$ s being between controls and genuine ADHD (-1.39 and -1.47), and the smallest  $d$ s observed between feigned and genuine ADHD (-0.62 and -0.77). Taken together, these findings indicated the feigners could successfully produce ADHD-consistent profiles. As a small exception, the ADHD-Sim group produced significantly higher scores on two CAARS subscales than those with ADHD regardless of whether they were entirely honest or somewhat exaggerating impairment (e.g., ADHD-Dx and ADHD-Ex). Still, the overwhelming body of literature suggests these measures can actually be faked successfully.

Given the susceptibility of ADHD-specific self-report measures to feigning, Harp et al. (2011) began a new line of research examining the utility of multiscale inventories, specifically the MMPI-2-RF (Ben-Porath & Tellegen, 2008/2011) in detecting feigned ADHD. Unlike the face valid ADHD-specific self-report measures, it was hypothesized that ADHD-related characteristics would be less obvious on the multifaceted MMPI-2-RF. On clinical scales, Harp et al. (2011) found feigners produced similar or slightly higher  $T$  scores than the clinical comparison group with no significant differences between groups. The ADHD-Sim group produced a mean score of 65.86 ( $SD = 13.00$ ) on the clinical scale RC4, which was the only clinical scale elevated by any of the groups.

In contrast, the validity scales yielded moderate effect sizes with  $d$ s ranging from 0.73 to 0.95 without prior research on feigned ADHD. Harp et al. (2011) produced cut

scores (e.g.,  $F-r \geq 70$ ;  $Fp-r \geq 77$ ;  $Fs \geq 91$ ) derived for optimal classification specifically for feigned ADHD. Interestingly, these cut scores are much lower than those used for general feigning (e.g.,  $F-r$ ,  $Fp-r$ ,  $Fs \geq 100$ ). The authors concluded the MMPI-2-RF validity scales hold modest potential for detecting feigned ADHD, but call for further replication, a topic addressed in the current study. Of note, these findings perhaps suggest measures not designed to solely assess ADHD symptoms, like the MMPI-2-RF, have utility in detecting feigned symptoms; however, major conclusions cannot be drawn from only a single study and one multiscale inventory.

Researchers have also investigated the effectiveness of neuropsychological measures in distinguishing feigned from genuine ADHD. In testing neuropsychological measures such as the Stroop Task (Stroop, 1935) and the Wechsler Test of Adult Reading (WTAR; The Psychological Corporation, 2001), Sollman et al. (2010) could not distinguish between the feigning and genuine ADHD groups.

Sollman et al. (2010) as well as Jasinski et al. (2011) also investigated the use of SVTs in detecting feigned ADHD. Sollman et al. administered the Digit Memory Test (DMT; Hiscock & Hiscock, 1989), Nonverbal Medical Symptom Validity Test (NV-MSVT; Green, 2008), Test of Memory Malinger (TOMM; Tombaugh, 1996), Miller Forensic Assessment of Symptoms Test (M-FAST; Miller, 2001), and Letter Memory Test (LMT; Inman et al., 1998). While the neuropsychological tests did not appear useful in detecting feigned ADHD across the board, the SVT research suggests some select measures may have utility in discriminating between genuine and feigned ADHD. For example, Sollmon et al. found the TOMM produced significant differences between the feigning and genuine ADHD groups (Hedges's  $g$  effect sizes ranged from -1.19 to -

1.60), which was similar to findings from Jansinki et al.'s study ( $d$ s from 1.21 to 1.49). With regards to the M-FAST, Sollman et al. found few participants in any groups endorsed many items, so despite its 1.00 specificity, this measure's sensitivity was low (sensitivity = .10) and its hit rate essentially at chance (.54). Still, both Sollman et al. and Jasinski et al. found utility in detecting feigned ADHD using the DMT ( $d = 1.33$ ,  $g = -1.10$ ), LMT ( $d = 1.61$ ,  $g = -1.06$ ), and NV-MSVT ( $d$ s = 1.25 and 1.45,  $g$ s = -0.96 and -0.97). Jasinski et al. noted the SVTs were more sensitive to detecting those in the ADHD-Sim group, as opposed to the ADHD-Ex group (which was a genuine ADHD group asked to exaggerate their symptoms) in their samples.

In summary, the simulation research has provided clear evidence that self-report ADHD measures are generally ineffective at distinguishing genuine from feigned ADHD. The effectiveness of CPTs in discriminating feigned from genuine ADHD profiles widely ranges depending on the study. Sollmon et al. (2010) found no significant differences between genuine and feigned ADHD and a modest effect size ( $d = -0.44$ ), while Quinn (2003) found much more encouraging discriminability with a large effect size when comparing the groups ( $d = 1.96$ ). The use of SVTs to detect feigned ADHD seems to suggest this could be a promising area for additional exploration to determine exactly which measures are successful at discriminating between genuine and feigned ADHD.

Based on this literature, the current study intended both to replicate prior established findings and to clarify contrasting findings. As described in the next section, this project aimed to contribute new information about how two commonly-used measures (i.e., TOVA and MMPI-2-RF) can be utilized to evaluate feigned ADHD.

## The Current Study

Over the last two decades, research has provided an important starting point for understanding how adults pursuing higher education feign ADHD (see Sullivan et al., 2007). Research has also offered insights into how some measures may be utilized to detect feigners (see Suhr et al., 2010). Methodologically, researchers have utilized both known-groups and simulation studies; additionally, researchers have examined several categories of measures used in ADHD assessments.

Building on prior research, the current study addressed three primary goals regarding feigned ADHD. The first goal was to investigate the usefulness of the TOVA (Greenberg et al., 1996) in detecting simulated ADHD profiles. As a second goal, the current study critically evaluated Suhr et al.'s (2010) Conners' Infrequency Index (CII) on the CAARS (Conners et al., 1998) via a simulation design, testing their specific cut scores for males and females. The current study went beyond examining the overall correct classification rates provided by Suhr et al. (2010) by also focusing on rule-in and rule-out classification. Additionally, Harp et al.'s (2011) revised Fp-r cut score on the MMPI-2-RF (Ben-Porath & Tellegen, 2008) for detecting feigned ADHD was studied in the current project to determine its utility in this sample. The current study also evaluated other "F family" validity indicators and their potential roles in detecting feigned ADHD.

The third major goal involved the development of a feigned ADHD scale on the MMPI-2-RF. Beginning with Gough's (1947) Dissimulation Scale (Ds) for the original MMPI, researchers have since developed various validity scales for multi-scale inventories. One of the most well-known "fake bad" scales was developed by Lees-

Haley, English, and Glenn (1991) to detect personal injury claimants' MMPI-2 responses that suggested malingered emotional distress. Lees-Haley et al. identified items on the MMPI-2 rationally, based on their content and the frequency with which malingerers endorsed them. Using a simulation-designed study, they were able to compare various criterion groups (e.g., known malingerers to legitimate claimants, etc.) and establish cut scores indicative of malingering. The current study followed this development paradigm for items specifically perceived to relate to ADHD on the MMPI-2-RF (Ben-Porath & Tellegen, 2008/2011).

To address these major goals, the present study implemented two simulation groups, one clinical-comparison group, and one control group. The two simulation groups were (a) ADHD Simulators (ADHD-Sim) – participants without ADHD asked to feign ADHD, and (b) Psychopathology Simulators (PSYC-Sim) – students without ADHD asked to feign general psychopathology. The clinical comparison group was labeled (c) ADHD Diagnosis (ADHD-Dx) – students with a diagnosis of ADHD asked to respond honestly, and (d) the control group (Non-ADHD) was comprised of students without ADHD who were asked to respond honestly. These well-defined groups allowed for direct comparisons between genuine and feigning groups on relevant assessment instruments. In addition, inclusion of the PSYC-Sim group allowed for a “near neighbor comparison.” By comparing ADHD-Sim and PSYC-Sim groups, results have further confidence in detecting feigned ADHD specifically, as opposed to feigning or “faking bad” more generally.

## Research Questions and Hypotheses

*Research Question 1: Will the ADHD-Sim Group be able to successfully feign ADHD on the TOVA?*

As previously noted, some CPTs have been vulnerable to feigned ADHD (Sollman et al., 2010), while others appeared more robust (Quinn, 2003). In particular, the TOVA has not been tested in terms of performance in genuine and feigned ADHD samples. This omission is somewhat surprising given its validation and use of Visual and Auditory formats, both of which are useful in evaluating ADHD. Therefore, this dissertation is the first known study of the TOVA's usefulness in detecting feigned ADHD.

Hypothesis 1: The ADHD-Sim group will score significantly lower than both the ADHD-Dx and the Non-ADHD groups on the Auditory TOVA's Total ADHD score, as well as three scales (Omission scale, Commission scale, and Variability scale).

Leark et al. (2002) reported initial findings for Omission and Commission scales and a non-significant trend on the Variability scale. No data existed to suggest how the PSYC-Sim group would perform; thus, no hypothesis was made regarding its results.

Hypothesis 2: The same trend predicted by Hypothesis 1 was expected for the Visual TOVA; however, the ADHD-Sim and ADHD-Dx groups' scores were not expected to vary significantly.

Quinn's (2003) results, using the Integrated Visual and Auditory (IVA) CPT, suggested stronger discriminability between genuine and feigned ADHD using the auditory scores, as opposed to the visual scores.



Hypothesis 3: ADHD-Dx will score lower than the Non-ADHD group on the TOVA's Total ADHD score, and all subscales (Omission, Commission, Response Time, and Variability).

Based on the TOVA's development and discriminant ability (Greenberg et al., 1996), it is hypothesized that the Non-ADHD group will score significantly better (i.e., higher TOVA scores) than the ADHD-Dx group (e.g., Non-ADHD > ADHD-Dx > ADHD-Sim). No hypotheses were made regarding PSYC-Sim group performance due to a lack of existing research suggesting where this group's scores would fall in comparison to other groups.

*Research Question 2: Which MMPI-2-RF validity scales will be more effective at detecting the ADHD-Sim and PSYC-Sim groups?*

Harp et al. (2011) reported F-r, Fp-r, and Fs as having the greatest discriminant validity between an ADHD-Sim group, a clinical group, and a non-ADHD group; therefore, the current study examined their results in the current sample.

Hypothesis 4: The Fp-r will produce larger effect sizes between the ADHD-Sim and ADHD-Dx groups than any other validity indicators from the "F family."

Hypothesis 5: The cut scores provided by Harp et al. (2011) will provide the highest specificity for distinguishing genuine from feigned ADHD. Specifically,  $F-r \geq 70$ ,  $Fp-r \geq 77$ , and  $Fs \geq 91$  will produce the most effective utility estimates (specificity  $\geq .90$ ) to reduce false alarms.

The FBS-r was designed as a symptom validity measure that assesses somatic and cognitive complaints. Given its association with high levels of overreporting generally,

this scale will likely be most effective at detecting individuals simulating broadly (e.g., not a specific disorder).

Hypothesis 6: The MMPI-2-RF's FBS-r scale will detect the PSYC-Sim group as providing dissimulated responses. Specifically, it was expected that this group would produce FBS-r  $T$  scores  $\geq 80$ .

*Research Question 3: Will the CAARS Infrequency Index (CII) be effective at detecting feigned ADHD?*

Suhr et al.'s (2010) development of the Conners' Infrequency Index (CII) utilized a rare symptoms detection strategy of "infrequently endorsed items" to identify ADHD simulators. They found the CII to be strongly related to feigning and supported its potential use in detecting feigned ADHD; however, they acknowledged it needed to be further validated via simulation design studies.

Hypothesis 7: ADHD-Sim males will be identified using the CII cut score  $\geq 21$ , whereas ADHD-Sim females will be identified using the CII cut score  $\geq 20$ .

#### Development of a Ds-ADHD Scale

*Supplementary Question 1: Is there an identifiable pattern of responses on the MMPI-2-RF to suggest a "fake bad" ADHD profile?*

Following the scale development paradigm utilized by Lees-Haley et al. (1991), participants in the Non-ADHD, ADHD-Sim, and PSYC-Sim groups will select items they perceive to be related to ADHD. The average item score (AIS) from the three groups will be computed and compared to the AIS from the ADHD-Dx group. Using an erroneous stereotype detection strategy, items infrequently endorsed by the ADHD-Dx group (i.e.,

<10.0%) but reported by the majority of the other groups (i.e., >50.0%) to be related to ADHD will be selected for the Ds-ADHD scale.

*Supplementary Question 2: Will the Ds-ADHD scale be effective at identifying feigned ADHD?*

*Supplementary Question 3: Will any gender differences exist between perceived ADHD items on the MMPI-2-RF?*

Regarding gender, research suggests a higher prevalence of ADHD in males than females (Faraone et al., 2003). However, females exhibit a higher prevalence of inattentive type ADHD than males (APA, 2013), which may skew their ratings of items as being related to ADHD. See Appendix B for gender-specific hypotheses regarding inattentive and behavioral items.

## CHAPTER 2

### METHODS

#### Design

The current study used a between-subjects simulation design to compare four main groups: (a) ADHD-Dx, (b) ADHD-Sim, (c) PSYC-Sim, and (d) Non-ADHD. The between-subjects simulation design offered several important advantages. For example, it allowed for direct comparisons of simulation groups and well-defined clinical groups. As recommended by Rogers (2008, p. 413), feigning research “must include clinical samples composed of individuals with genuine mental disorders and no evidence of feigning.” As noted, this design allowed for direct comparisons in this study between simulation (ADHD-Sim and PSYC-Sim) as well as genuine (ADHD-Dx and Non-ADHD) groups. Having two simulation groups provides a methodological advantage because more specific conclusions can be drawn for feigned ADHD (i.e., a specific diagnosis) as opposed to a more general “fake bad” profile.

The between-subjects simulation design has two additional strengths when compared to the within-subjects design: no carryover effect and a major reduction of fatigue (Rogers, 2008). This design, with only one condition, allows for very little contamination, such as confusion from responding to multiple instructional sets. From a practical perspective, between-subjects simulation design participants are less likely to suffer boredom and fatigue than those repeating the same measures under different conditions. Additionally, between-subjects methodology lessened participants’ abilities to accomplish better scores as a result of practice and experience.

The establishment of well-defined criterion groups was central to this simulation design. The ADHD-Dx group represented the students who received comprehensive

psychological assessments at the University of North Texas Psychology Clinic and were subsequently diagnosed with ADHD. These clinical data were obtained from archival records, which independently confirmed the ADHD diagnosis as well as the absence of malingering as a V code. For the experimental component of the design, three groups of university students were randomly assigned to the ADHD-Sim, PSYC-Sim, or Non-ADHD groups. The ADHD-Sim group consisted of current university students without an ADHD diagnosis, who were asked to feign ADHD. The PSYC-Sim group served as a “near neighbor comparison” (Rogers, 2008). They completed the measures under instructions to feign general psychopathology. The PSYC-Sim group provided systematic comparisons between feigned psychopathology and feigned ADHD (ADHD-Sim). Finally, the Non-ADHD group served as a control sample. These individuals were undergraduate students without an ADHD diagnosis who completed the measures under standard instructions. One noted limitation of the current study is the lack of a “PSYC-Dx” group (i.e., those with documented mental disorders other than ADHD).

An inherent strength of simulation studies involves internal validity (Weiner & Otto, 2013). For internal validity, the study utilized random assignment for participants in the ADHD-Sim, PSYC-Sim, and Non-ADHD groups. These participants were also administered a manipulation check (See Appendix C) (a) to ensure they understood and followed their directions and (b) to determine whether an adequate level of effort was put forth, which constitutes an essential component of simulation research (Foschi, 2014; Rogers, 2008). Protocols failing the manipulation check (e.g., could not recall instructions or acknowledged insufficient effort) were excluded in order to preserve the well-defined criterion groups.

An additional element of internal validity was to ensure participants' consistent involvement in responding to psychological measures, especially on the Minnesota Multiphasic Personality Inventory, Second Edition, Restructured Form (MMPI-2-RF; Ben-Porath & Tellegan, 2008/2011), a lengthy inventory of 338 test items. Therefore, participants were excluded if either their MMPI-2-RF Variable Response Inconsistency (VRIN-r) scale or their True Response Inconsistency (TRIN-r) was markedly elevated ( $T \geq 80$ ). Such elevations indicate either excessive response inconsistency or excessive fixed responding, respectively. Importantly, this exclusion rule was not applied to those in the PSYC-Sim or the ADHD-Sim group, as these response sets may have been considered by participants as methods to faking broad psychopathology or ADHD. Similarly, if a participant's Inconsistency Index on the Conners' Adult ADHD Rating Scale (CAARS; Conners, Erhardt, & Sparrow, 1999) was elevated ( $> 8$ ), that individual's data was excluded. Again, this was only applied to the genuine groups (ADHD-Dx and Non-ADHD). Overall, exclusion criteria were kept to a minimum to keep the findings as representative as possible for the broadest range of individuals.

Beyond study design, research materials – specifically instructions for various experimental groups – were intentionally selected to increase the internal and external validity. Instructional sets comprise a crucial component in simulation design studies, as participants are asked to assume a specific role. Following the suggested guidelines for simulation research (i.e., Rogers & Cruise, 1998), instructional sets are typically written at a low reading level. Because the current sample consisted of college students, reading level was not anticipated to be an issue. Regarding other guidelines, Rogers and Gillard (2011) suggest using a familiar situation in a scenario increases the

likelihood that participants can identify and respond in a realistic and motivated way. Therefore, the specific roles and scenarios were constructed to be relevant to this population (i.e., college students).

To maximize external validity, this study examined responses from an undergraduate student population, for whom feigned ADHD is comparatively prevalent (Harrison, 2006). The scenario also provided participants with internal incentives (e.g., "Your roommate is doing so much better in classes and has more time to socialize.").

Researchers have recommended that simulation studies implement both external and internal incentives in order to increase motivation (Haines & Norris, 1995; Rogers, 2008). In contrast, Weber (2008) suggested monetary incentives do not improve feigning performance in simulation studies. Nonetheless, the researcher decided to provide an external incentive - a chance to win one of two \$50 Target gift cards - as an attempt to increase motivation. Two participants won lottery drawings for the gift cards, which were conducted following the completion of data collection. As an internal incentive, the scenarios included a personal challenge (e.g., "Are you clever enough to fake enough to get medication, but not be so blatant that you get caught?").

Lastly, as is recommended by Rogers (2008), the scenario cautioned the participants against blatant feigning of symptoms. Additional research (Storm & Graham, 2000) has cautioned against warning participants because this may lead to protocols with less severe or less detectable malingering; however, one goal of simulation research is to reflect (as closely as possible) real-world consequences, such as being discovered "faking." Therefore, a caution was deemed necessary to increase external validity of the study.

## Participants

### University-Based Participants

The planned sample was to include approximately 30 undergraduate students in each of the four groups, creating an overall sample size of 120 participants. This sample size would allow for enough power for small to moderate effects (Effect size  $f = 0.40$ ) to be observed (Faul, Erdfelder, Lang, & Buchner, 2007). For systematic comparisons across groups, all participants comprising the ADHD-Sim, PSYC-Sim, and Non-ADHD groups were limited to undergraduate students enrolled at the University of North Texas.

Inclusion criteria for participants in ADHD-Sim, PSYC-Sim, and Non-ADHD groups were the following: age (i.e.,  $\geq 18$  years) and educational setting (i.e., currently enrolled as an undergraduate student at the University of North Texas). Although fluency in English was not explicitly required, it was addressed indirectly by enrollment in English speaking undergraduate courses.

Exclusion criteria were implemented to ensure that undergraduate groups were unlikely to include participants with genuine ADHD. To reduce overlooked ADHD in these groups, participants were excluded from the study if they reported a diagnosis of ADHD or had current complaints of significant problems with ADHD-related symptoms. Other exclusion criteria involved a reported history of LD, or if they reported a history of or current neurological problems. As a further precaution, any participants reporting a current or recent (i.e., within the last two months) use of prescribed stimulant medications (e.g., Adderall) were excluded from participation.



Participants were not excluded based on race or ethnicity, educational classification (e.g., freshman, sophomore, etc.), sexual orientation, or gender. Because research (e.g., DSM-5; American Psychiatric Association, 2013) has found a higher prevalence of ADHD in males than females, efforts (e.g., oversampling of male undergraduate students) were made to approximately match the gender ratio found in data from the clinical comparison sample, ADHD-Dx.

#### Clinic-Based Participants

For the clinical comparison sample, the ADHD-Dx group was obtained by using archival data from ADHD assessment files from the University of North Texas Psychology Clinic, spanning 2010 to 2014. Two main inclusion criteria were implemented. First, participants must have consented to have their assessment results and demographic data be used for research purposes. Second, these individuals must have received an ADHD diagnosis, which could include any ADHD subtypes (DSM-IV-TR) or specifiers (DSM-5). Consistent with the clinic's policies, these diagnoses were based on a comprehensive psychological evaluation with in-depth clinical interviews and integration of test results. Importantly, participants were not excluded based on additional diagnoses (e.g., Bipolar Disorder or Depression); however, these diagnoses were recorded and used in post-hoc comparisons. Participant reports were also reviewed for information pertaining to the client's psychiatric medication status at the time of the evaluation. None of the participants were documented as being prescribed stimulant medications during their assessment.

For inclusion in the study, two ADHD measures were sought: (a) the Conners' Adult ADHD Rating Scale (CAARS; Conners et al., 1999) and (b) the Test of Variables

of Attention (TOVA; Greenberg, Kindschi, Dupuy, & Corman, 1996). A third ADHD measure was viewed as optional – the Wender Utah Rating Scale (WURS; Ward, Wender, & Reimherr, 1993). Beyond ADHD specific measures, records were reviewed to select cases where the MMPI-2-RF (Ben-Porath & Tellegan, 2008) and the Psychiatric Diagnostic Screening Questionnaire (PDSQ; Zimmerman & Mattia, 2001) were also administered. Of note, MMPI-2 protocols were rescored to reflect the MMPI-2-RF scales, which is a common practice in MMPI-2-RF research (Sellbom & Lee, 2013). Due to the archival nature of these data, the researcher could not control for the order in which tests were administered.

### Materials

*Psychiatric Diagnostic Screening Questionnaire (PDSQ).* The PDSQ (Zimmerman & Mattia, 2001) is a 126-item questionnaire for adults that screens for 15 DSM-IV mental disorders. Items, scored as “yes” or “no,” reflect five diagnostic areas: eating disorders, mood disorders, anxiety disorders, substance abuse disorders, and somatoform disorders. It also includes a six-item psychosis screen. The PDSQ is commonly used in outpatient settings to initially evaluate patients seeking treatment. In terms of reliability, the mean of the alpha coefficients has been reported to be .86, and the mean of the test retest correlations was .83 (Zimmerman & Mattia, 2001). For construct validity, Sheeran and Zimmerman (2004) found the overall factor structure of the PDSQ was consistent with the DSM-IV nosology.

*Conners' Adult ADHD Rating Scale Self-Report Long Form (CAARS).* The CAARS (Conners et al., 1999) is a 66-item self-report inventory for assessing adult ( $\geq 18$  years old) ADHD symptoms. Responses are scored on a 4-point Likert type scale ranging from “0” (not at all) to “3” (very much). It consists of four factor-analytic scales:

Inattention/Cognitive Problems, Hyperactivity/Restlessness, Impulsivity/Emotional Lability, and Problems with Self-concept. For response consistency, the Inconsistency Index is calculated via whether item responses are consistent, based on type and severity of the symptoms being endorsed. Importantly, the index is purely a measure of inconsistent responding, as opposed to a measure of faking bad (CAARS Technical Manual; Conners et al., 1999). For the CAARS' reliability, Erhardt, Epstein, Conners, Parker, and Sitarenios (1999) found excellent internal (alphas ranging from .86 to .92) and test-retest (mdn.  $r = .87$ ) reliability. For criterion-related validity, sensitivity and specificity were both high when compared to adults without a history of ADHD, with an overall classification rate of 85.0%. Concurrent validity was examined using the Wender Utah Rating Scale (WURS; Ward et al., 1993), with low to moderate correlations (e.g., ranging from  $r = .37$  to  $r = .48$ ) between the WURS and CAARS (Erhardt et al., 1999) scales.

*Wender Utah Rating Scale (WURS).* The WURS (Ward et al., 1993) is a 61-item self-report instrument measuring adults' retrospective accounts regarding the presence and severity of their childhood ADHD symptoms. Responses range from "0" (not at all or very slightly) to "4" (very much). For reliability, the internal consistency exceeds .85 (Weyandt, Linterman, & Rice, 1995). For discriminant validity, Ward et al. (1993) reported the WURS differentiated between clinical and control samples (e.g., individuals without ADHD) with an 86.0% accuracy rate. More recently, McCann, Scheele, Ward, and Roy-Byrne (2000) found a moderate sensitivity of .72.

*Test of Variables of Attention (TOVA).* The TOVA (Greenberg et al., 1996) is an individually administered, computer-based, continuous performance test (CPT). The

TOVA is used to assess attention and impulse control in clinical and normal populations. It measures percentages of performance for four variables: response time variability, response time, commission errors, and omission errors. Performance totals are interpreted via the ADHD total score, which reflects the participant's overall performance as compared to those diagnosed with ADHD.

The TOVA has two sensory stimuli components, Auditory and Visual, with each component requiring approximately 21 minutes to complete. The Visual component asks participants to discriminate between two geometric figures centered on a computer screen (i.e., target versus distracter). The Auditory stimulus consists of two tones, which participants are asked to discriminate between by clicking the mouse when a specific tone is heard. Given the timed nature of the task, split-half reliability was measured using Pearson product correlations ranging from .70 to .93 (Leark, Greenberg, Kindschi, Dupuy, & Hughes, 2007). Split-half internal consistency was also found to be high ( $r_{xy} = 0.93$ ; see Llorente et al., 2001). In terms of discriminant validity, the TOVA has been shown to differentiate between ADHD, Conduct Disorder, and non-disordered individuals (Waldman & Greenberg, 1992). Predictably, the TOVA appears to be unaffected by the presence of a comorbid reading disorder (Dupuy & Greenberg, 1993). Results suggest a sensitivity of .67 and a corresponding specificity of .90 for accurate classification of individuals with ADHD versus controls (see TOVA Professional Manual; Leark et al., 2007).

*Minnesota Multiphasic Personality Inventory – Second Edition – Restructured Form (MMPI-2-RF)*. The MMPI-2-RF (Ben-Porath & Tellegen, 2008/2011) is commonly described as a revised version of the MMPI-2, containing 338 of the original 567 items.

The MMPI-2-RF assesses for personality features and patterns of psychological problems with 50 new and revised subscales. All items are presented in the true-false format, with an easy reading comprehension of approximately fifth grade level. The norms from the MMPI-2-RF were extended but are based heavily on the MMPI-2 normative sample (Ben-Porath & Tellegen, 2008/2011). According to the manual, test-retest reliability in the normative sample ranges from acceptable to excellent (.40 to .84) for the validity scales and on the Higher Order (H-O) and Restructured Clinical (RC) scales (from .64 to .90). The authors report a wide range of internal consistencies ( $\alpha$ ) from .20 to .69 for validity scales and from .63 to .80 for H-O and RC scales. In terms of discriminant validity, Wygant et al. (2009) found the MMPI-2-RF overreporting scales distinguished between protocols of individuals with feigned versus genuine medical problems. Sellbom and Bagby (2010) also reported some "F family" validity scales distinguished genuine psychiatric patients from students asked to feign psychopathology. The MMPI-2-RF technical manual (Tellegen & Ben-Porath, 2008/2011) provides extensive reliability and validity data for this instrument.

With respect to response styles, the MMPI-2-RF has specific indicators for inconsistent responding, overreporting, and underreporting of symptoms. Focusing on feigning, F-r assesses responses that are infrequently endorsed by non-clinical samples. In contrast, Fp-r measures items that are infrequently endorsed in psychiatric populations, while FBS-r is a scale assessing the over-reporting of somatic and cognitive complaints. For each of these scales,  $T$  scores  $\geq 100$  are considered strongly suggestive of feigning (Ben-Porath & Tellegen, 2008/2011); however, other research

(Rogers, Gillard, Berry, & Granacher, 2011) has suggested more variability in optimized cut scores (e.g.,  $F-r \geq 130$ ,  $Fp-r \geq 90$ , and  $Fs \geq 120$ ).

### Procedure

As discussed previously, the experimental component of the current study consisted of two simulation groups (ADHD-Sim and PSYC-Sim) and one control group (Non-ADHD). They are contrasted with the clinical comparison group (ADHD-Dx) obtained via archival files. Procedures varied substantially depending on group. The procedures for the experimental groups are discussed first, followed by the clinical comparison sample.

#### Experimental Groups Procedures

Participants for the three experimental groups were initially recruited via a researcher attending psychology undergraduate courses and inviting students to sign up for research participation. As approved by the University of North Texas (UNT) Institutional Review Board (IRB), students were allowed to be recruited via this classroom approach, and they were given credit for their psychology-course research requirements.

As noted, the ADHD-Sim, PSYC-Sim, and Non-ADHD participants were randomly assigned to one experimental group. More specifically, a list of participant IDs and associated conditions were produced via a random number generator (i.e., Research Randomizer; [www.randomizer.org/form.htm](http://www.randomizer.org/form.htm)) to ensure random assignment. As mentioned previously, a plan for oversampling was put in place to produce a gender ratio similar to that of the ADHD-Dx group. As described later, this attempt was unsuccessful given the insufficient number of males in the recruitment classes, but ultimately unnecessary because no gender differences were observed between groups.

In accordance with the UNT IRB approval, researchers individually reviewed the informed consent with all participants prior to any involvement in the study. Specifically, participants were informed of their rights as research participants, the purpose of the study, and the study's duration and procedures (e.g., approximately 2 hours, computerized tests, pencil-and-paper tests, etc.). They were also informed of rights of confidentiality. All questions were addressed. If participants agreed to complete the study, they were asked to sign the informed consent form.

To avoid a methodological confound to the current study's design, persons with a history of ADHD were excluded from the experimental samples. Therefore, researchers attempted to systematically identify participants reporting any current or previous problems associated with LD, ADHD, or neurological difficulties (see the earlier Participants section for more details). This information was obtained via the Demographic Questionnaire (see Appendix D). Those individuals identified with potential ADHD history or symptoms were thanked and excused from further participation.

Following informed consent and the administration of the demographic questionnaire, participants in experimental groups were sequentially administered the PDSQ, TOVA, MMPI-2-RF, CAARS, and WURS. The rationale for this order was based on several factors. The PDSQ was administered first to parallel the archival group (ADHD-Dx), as all clients in the UNT Psychology Clinic are given this measure first. The TOVA was ordered next for practical reasons. It is typically experienced as a highly repetitive task; therefore, it was administered next to minimize the effects of fatigue on participant performance. Next, participants in all three experimental groups completed

the MMPI-2-RF. Its placement provided 30 to 50 minutes between the MMPI-2-RF administration and subsequent review of items for development of the Ds-ADHD scale. Then the CAARS and WURS were administered to participants with specific instructions regarding the timeframes for each measure.

**Non-ADHD Control Group.** The Non-ADHD group served as the control group with measures administered under standard test instructions. First, participants were informed of their task (e.g., answer honestly) and the procedures (e.g., complete several types of tests). The instructions encouraged forthrightness and emphasized the study's importance, in order to motivate students to follow directions.

The Non-ADHD group participants were presented with the following honest instructions:

The researcher will ask you to complete several measures today. Four will be paper and pencil format, and two are on a computer. The questions will be about different things, including psychological symptoms, your personality, and how well you pay attention.

Please try your hardest to complete all the measures as accurately as possible. Don't worry about getting the "right" answers; you are only asked to be completely honest and do your best job. Remember to try your best, your answers may help develop a psychological measure that could help clinicians better perform assessments with college students.

Following these instructions, Non-ADHD participants were administered the PDSQ, TOVA, MMPI-2-RF, CAARS, and WURS in the previously described order. Upon completion of the WURS, participants were administered the ADHD item rating sheet based on MMPI-2-RF items. A researcher provided the participants with the following instructions:

Now you'll be given one of the measures you already completed today. This time, you don't have to mark any answers. All you have to do is circle the questions



you think are about ADHD. Circle the items you think someone with ADHD would mark "true." Let the researcher know when you are finished.

The researcher was available to further explain these instructions if participants did not fully understand them. If participants had questions, they were also answered by the researcher. Non-ADHD participants were then asked to categorize the MMPI-2-RF items that were relevant to ADHD.

After completing the data collection, a researcher administered a manipulation check to ensure participants (a) recalled the instructions and (b) reported compliance and their level of effort in succeeding. For the post-hoc analyses, participants were then asked a series of questions related to their knowledge and familiarity with ADHD. These questions required "yes" or "no" responses to items such as: "Is anyone in your family diagnosed with ADHD?" In addition, they were provided with self-assessment questions such as: "Before this study, how much would you say you knew about ADHD?" The purpose of these debriefing questions was to determine how familiar the samples were with ADHD. This information is relevant given that participant responses regarding MMPI-2-RF items perceived to be related to ADHD were the basis for the development of the Ds-ADHD scale. The ADHD Knowledge Follow-up Questionnaire can be found in Appendix E.

ADHD-Sim Group. Participants randomly assigned to the ADHD-Sim group followed the procedures outlined above under different instructions. Those participants in the ADHD-Sim group were given the following instructional set adapted from Sollman, Ranseen, and Berry (2010):

Your roommate has been diagnosed with ADHD. He had trouble with classes, but then was given some medication for ADHD from his family doctor, and now does well. He even got a couple of A's recently, and has more time to socialize

because studying is not as hard! During your midterms, you decided to try your roommate's medication, and ended up surprising yourself with how much easier things went. You think that you may have undiagnosed ADHD, so you Google the disorder to learn more about it. On the following pages are some of the things that you find. When you are done reviewing these materials, please use the colored 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.

Please take the following tests as if you are trying to convince a psychologist that you have ADHD. Remember, you're trying to be convincing so that you can get a prescription like your roommate. It is not necessary for you to try to act like you have ADHD; you only need to respond to the test items as if you do. In other words, it's about how you *answer* the questions, not how you *act* while taking the tests.

If you are successful at deceiving the tests and following instructions throughout, you have a chance to win a \$50 gift card! But beware, some tests have questions to catch fakers, so you have to be smart about it. If you are too obvious, the psychologist would never believe you and you would get in trouble. Are you clever enough to fake enough to get medication, but not be so blatant that you get caught?

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

Multiple scenarios and instructions were considered from the feigning ADHD literature (e.g., Leark, Dixon, Hoffman, & Huynh, 2002; Quinn, 2003). It was decided to slightly modify the Sollman et al. (2010) scenario for the current study for two reasons: (a) the scenario was highly relevant to a university setting, and (b) it included a monetary incentive to increase the external motivation for participants to put forth good effort. To assist simulators in identifying with the study, the scenarios were designed to be gender specific (e.g., females received instructions with female pronouns and vice versa). Appendix F contains all of the scenarios for each condition and gender. In addition, Appendix G provides the materials that were given to participants regarding information on ADHD (for the ADHD-Sim group) or mental disorders (for the PSYC-Sim group).

Unlike other groups, the ADHD-Sim group received extra questions at the very end of their participation pertaining to any strategies they may have used to feign ADHD (see Appendix H). First they were asked an open-ended question about how they tried to fake ADHD. Then, they were asked a series of yes/no questions obtained from an earlier study (see Frazier, Frazier, Busch, Kerwood, & Demaree, 2008) pertaining to various strategies such as the following: “Did you try to miss difficult items?” and “Did you pretend to have difficulty remembering things?” Finally, participants were thanked for their participation and informed the study was concluded.

PSYC-Sim Group. Similar to the ADHD-Sim group, the PSYC-Sim scenario and instructions were adapted from Sollman et al.’s (2010) study. However, this scenario was slightly more general, so as to allow participants to interpret and simulate general psychopathology without specifically being asked to fake a particular mental disorder. After informed consent was obtained, participants were given the following scenario and instructions:

Your roommate has recently been diagnosed with a mental disorder. You are not sure if it was depression, anxiety, or something else. He had trouble with classes, but then was given some medication from his family doctor, and now does well. He even got a couple of A’s recently, and is now able to socialize more. You have some of the same symptoms as your roommate, so during your midterms, you decided to try your roommate’s medication, and ended up surprising yourself with how much easier things went. You think that you may have a mental disorder, so you Google mental disorders to learn more about them. On the following pages are some of the things that you find.

When you are done reviewing these materials, please use the colored 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.

Please take the following tests as if you are trying to convince a psychologist that you have a mental disorder. Remember, you’re trying to be convincing so that you can get a prescription like your roommate. It is not necessary for you to try to act like you have a mental disorder; you only need to respond to the test items as

if you do. In other words, it's about how you *answer* the questions, not how you *act* while taking the tests.

If you are successful at deceiving the tests and following instructions throughout, you have a chance to win a \$50 gift card. But beware, some tests have questions to catch fakers, so you have to be smart about it. If you are too obvious, the psychologist would never believe you and you would get in trouble. Are you clever enough to fake enough to get medication, but not be so blatant that you get caught?

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

Correspondingly to the ADHD-Sim group, the PSYC-Sim group received a few additional questions regarding their strategies for faking a mental disorder (See Appendix H). Specifically, they were asked an open-ended question regarding their faking strategies. Then they were asked to identify any specific disorders they were trying to fake. Participants were thanked for their participation and informed the study was concluded.

#### Clinical Comparison Sample

ADHD-Dx Group. The ADHD-Dx group data were collected from client files from the University of North Texas Psychology Clinic for individuals who had previously sought psychological evaluations. Importantly, all participants had previously consented to have their data used for research purposes as part of their informed consent to receive services at the clinic. A list of completed assessment files was generated, including file numbers but no names for the available years specified (2010-2014). Each file was reviewed for the inclusion and exclusion criteria. Only those meeting the criteria were entered into a database.

To protect confidentiality, all the entered data were de-identified. In addition, no personal information was recorded that might indirectly identify these clients. Only the minimal demographic information (i.e., age, gender, educational status) was compiled.

In accordance with the clinic policy, no client files were removed from the building as an important precaution to protect the confidentiality of the clinic clients. Following data entry, files were returned to the clinic storage.

## CHAPTER 3

### RESULTS

#### Refinement of the Sample

The total sample originally consisted of 159 college students distributed across the four groups (ADHD-Dx, ADHD-Sim, PSYC-Sim, and Non-ADHD). Three exclusion rules were applied in reviewing for their completeness and the consistency of participant responses. First, only one participant's data were excluded due to non-completion of the protocol in its entirety. Second, in terms of consistency, no individuals were removed from the sample based on elevated VRIN or TRIN scores from the Minnesota Multiphasic Personality Inventory - 2<sup>nd</sup> Edition, Restructured Form (MMPI-2-RF; Ben-Porath & Tellegen, 2008/2011). Third, also related to consistency, the Inconsistency Index on the Conners' Adult ADHD Rating Scale (CAARS; Conners, Erhardt, & Sparrow, 1999) was reviewed for elevations for any participants in genuine groups (Non-ADHD or ADHD-Dx). However, no individuals were removed from data analysis based on this exclusion criterion.

As a secondary examination, genuine group protocols (Non-ADHD and ADHD-Dx) were inspected for potential feigning. After reviewing the validity scales on the MMPI-2-RF, four individuals were removed from the ADHD-Dx group due to extremely high levels ( $> 100$   $T$ ) of Infrequent Responses (F-r), Infrequent Somatic Responses (Fs), or Infrequent Psychopathology Responses (Fp-r). Extreme elevations on any one of these scales were considered to be possible indicators of feigning, and therefore their data were excluded. An additional three participants in the Non-ADHD group were removed for producing elevated  $T$  scores on the same MMPI-2-RF over-reporting scales.

A manipulation check was also implemented to ensure participants' adherences to the instructions and to evaluate each participant's level of effort. Three participants, one from the Non-ADHD group and two from the ADHD-Sim group, were removed from analyses due to self-reported low effort during the administrations. In contrast, no participants were excluded based on an inability to recall their condition instructions. Complete and consistent data representing a good effort and an absence of feigning were retained for the final sample.

#### Description of the Final Sample

The final sample consisted of 148 college student participants, with more individuals in the ADHD-Dx group ( $n = 51$ ) than other groups. The remaining participants were generally evenly distributed among the three experimental groups: ADHD-Sim ( $n = 32$ ), PSYC-Sim ( $n = 35$ ), and Non-ADHD ( $n = 30$ ).

One methodological issue involved the administration of required and preferred measures in the clinical comparison sample (ADHD-Dx). As an archival sample, it was not possible to attain protocols inclusive of all the measures administered to the experimental groups. By increasing the ADHD-Dx group to include 51 participants, that sample consisted of at least 30 individuals who had completed each of the required measures. This intentional increase in the ADHD-Dx group ensured the group size was sufficient to run desired analyses for each measure with adequate power.

With regard to demographic variables, the participants ranged in age from 18 to 51, with an average age of 23.72 years ( $SD = 6.31$  years). The ADHD-Dx group was significantly older than all others, with a mean age of 27.53 years. Initially, this difference was thought to be the result of the six graduate students in the ADHD-Dx

sample, given that the other groups consisted entirely of undergraduate students. However, even when those six individuals were removed from the analysis, the significant age difference between groups remained. See Table 5 for additional details. In terms of gender, the final sample included slightly more females than males with 57.4% and 42.6%, respectively. Importantly, no significant differences were observed between groups with regard to gender composition ( $\chi^2 = 4.13$ ;  $p = .25$ ). Finally, the groups were comparable in terms of education level.

Table 5  
*Differences in Age and Education Level Among Groups*

Differences in Age and Education Level among Groups										
	Simulation Groups				Genuine Groups					
	ADHD-Sim ( <i>n</i> = 32)		PSYC-Sim ( <i>n</i> = 35)		Non-ADHD ( <i>n</i> = 30)		ADHD-Dx ( <i>n</i> = 51)		<i>F</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Age	21.94 <sub>a</sub>	3.48	21.69 <sub>a</sub>	3.03	21.50 <sub>a</sub>	3.07	27.53 <sub>b</sub>	8.67	11.54	<.001
Education Level	15.06	0.98	15.17	0.99	14.83	1.29	14.71	1.32	1.25	.29

*Note.* Education Level = number of years of completed education.

The majority of the final sample self-identified as European American (54.7%). The remaining sample was composed primarily of African Americans (15.5%) and Hispanic Americans (16.9%), with 8.1% of participants reporting they were biracial and 4.1% identifying as Asian American.<sup>1</sup> Statistically, no significant differences were observed in ethnicity across groups (see Table 6 for details).

Due to the inclusion criteria of being a college student, all participants were predictably similar in terms of education. The final sample included 25 (16.9%) Freshmen, 25 (16.9%) Sophomores, 38 (25.7%) Juniors, 52 (35.1%) Seniors, and 6 (4.1%) graduate students. Two participants in the ADHD-Dx group (1.4%) could not be

<sup>1</sup> One ADHD-Dx participant's ethnicity was not recorded in their file information (archival) and therefore was not included in any ethnicity analyses.



classified because their files omitted data on their class standing. Finally, the six graduate students from the ADHD-Dx group could not be included in this analysis because the cell count violated an assumption for a chi-square analysis. The small number of graduate students in the overall sample was predictable, as experimental data were only collected from undergraduate students.

Table 6  
*Differences in Ethnicity and Education Level among Simulation and Genuine Groups*

Ethnicity	Simulation Groups				Genuine Groups				$\chi^2$	$p$
	ADHD-Sim ( $n = 32$ )		PSYC-Sim ( $n = 35$ )		Non-ADHD ( $n = 30$ )		ADHD-Dx ( $n = 51$ ) <sup>a</sup>			
	$n$	%	$n$	%	$n$	%	$n$	%		
European American	14	43.8	14	40.0	16	53.3	37	72.5	18.01	.46
African American	7	21.0	8	22.9	4	13.3	4	7.8		
Hispanic American	7	21.0	7	20.0	7	23.3	4	7.8		
Asian American	1	3.1	3	8.6	1	3.3	1	2.0		
Mixed Race/Other	3	9.4	3	8.6	2	6.7	4	7.8		
Education Level <sup>b</sup>	$n$	%	$n$	%	$n$	%	$n$	%	17.44	.04
Freshman	3	9.4	3	8.6	8	26.7	11	21.6		
Sophomore	5	15.6	5	14.3	3	10.0	12	23.5		
Junior	11	34.4	10	28.6	5	16.7	12	23.5		
Senior	13	40.6 <sub>a</sub>	17	48.6 <sub>a</sub>	14	46.7 <sub>a</sub>	8	15.7 <sub>b</sub>		

*Note.* Subscripts indicate significant differences between groups. Despite two cells with expected cell counts less than 5, the overall assumption of expected cell count was not violated.

<sup>a</sup> Due to missing data, one participant's ethnicity and two participants' years in school were not included.

<sup>b</sup> Six ADHD-Dx participants were removed from this analysis because they were graduate students.

A chi-square analysis indicated the participant groups were statistically different in terms of their education level ( $p = .04$ ). Post-hoc analysis revealed significantly lower numbers of seniors in the ADHD-Dx group than in all other groups. One partial explanation for this disparity is that experimental participants were recruited from advanced psychology courses, which likely included a larger proportion of more advanced students than the ADHD clinic referrals (ADHD-Dx). Another possible consideration is that individuals truly experiencing ADHD symptoms likely recognized this earlier rather than later in their academic careers, and thus, the ADHD-Dx sample would naturally include more individuals earlier in their college experience.

Another demographic point of comparison included variables related to mental health history (see Table 7). Participants were asked about whether they had ever received a mental health diagnosis (excluding the ADHD-Dx sample), if so what type of diagnosis, and lastly if they had ever been prescribed psychiatric medication for treatment. Overall, 77.0% of the sample denied having a current diagnosis of any mental disorder. Of the 23.0% with a reported current diagnosis, half (17 participants or 50.0%) indicated having a mood disorder, while anxiety and learning disability disorders each were reported by six (17.6%) participants. Of the 34 participants with diagnoses, eight individuals reported multiple diagnoses. Table 7 below highlights the frequency with which group members endorsed the mental health variables on the demographic questionnaire.

Table 7

*Frequencies of Current Mental Health Diagnoses, Specific Diagnoses, and Psychiatric Medication Among Simulation and Genuine Groups*

	Simulation Groups				Genuine Groups			
	ADHD-Sim ( <i>n</i> = 32)		PSYC-Sim ( <i>n</i> = 35)		Non- ADHD ( <i>n</i> = 30)		ADHD-Dx ( <i>n</i> = 51)	
Diagnoses	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Yes	5	14.7	7	20.6	4	11.8	18	52.9
No	27	23.7	28	24.6	26	22.8	33	28.9
Type of Diagnosis								
Mood	3	15.8	6	31.6	2	10.5	8	42.1
Anxiety	2	20.0	1	10.0	2	20.0	5	50.0
LD	0	0.0	0	0.0	0	0.0	11	100.0
Psychiatric Medications								
Yes	2	8.7	8	34.8	2	8.7	11	47.8
No	30	24.0	27	21.6	28	22.4	40	32.0

*Note.* Mood = Any mood disorder; Anxiety = Any anxiety disorder; LD = Any learning disability diagnoses. Participants were asked to report any prior or current diagnoses and medication prescriptions without distinguishing the timeframe.

#### Informal Check of Adherence to Instructions

As discussed in Chapter 2, the PDSQ is a screening tool and therefore allows for a higher false positive rate in order to maximize its sensitivity. This measure served as an informal check to determine whether those in the PSYC-Sim condition followed their directions and simulated general psychopathology. Mean percentages for each group were compared to examine which groups produced averages greater than the suggested cut scores. From this comparison, results suggest the PSYC-Sim group utilized a broad approach to feigning, and on average exceeded the cut scores for almost half ( $M = 48.1\%$ ) of the scales. In contrast, the ADHD-Sim group endorsed items above the cut score at a much lower rate ( $M = 25.7\%$ ). See Appendix J for additional details.

### Clinical Differences between Genuine Groups

Consistent with prior research (Suhr, Hammers, Dobbins-Buckland, Zimak, & Hughs, 2008; Sullivan, May, & Galbally, (2007), the CAARS was generally unable to distinguish feigned from genuine ADHD in our sample (see Table 9 below). Given the gender specific scoring system of the CAARS, our data were broken down by gender. Despite the overall MANOVAs being significant for both males [ $F(21, 136) = 3.70, p < .001$ ; Wilk's  $\Lambda = 0.273$ , partial  $\eta^2 = .35$ ] and females [ $F(21,182) = 7.27, p < .001$ ; Wilk's  $\Lambda = 0.173$ , partial  $\eta^2 = .44$ ], Tukey's post-hoc comparisons reveal the differences were rarely observed between genuine and feigned ADHD. In fact, significant differences were not observed between genuine and feigned ADHD on any of the scales for females, and only on three scales for the males (Hyperactivity/Restlessness, Hyperactive-Impulse Symptoms, ADHD Symptoms Total). This pattern indicates men may tend to over-report their symptoms, while women tend to feign more selectively on this particular measure.

The PSYC-Sim group's performance on the CAARS varied slightly by gender. No significant differences were found between genuine ADHD and feigned psychopathology (PSYC-Sim) in the male groups, indicating limited discriminability. Comparing female performance between the ADHD-Dx and PSYC-Sim groups, it appears PSYC-Sim feigners reported less hyperactivity symptoms than those in the ADHD-Dx group. This measure appears to discriminate more effectively with females than will males with respect to feigned general psychopathology.

In general, the CAARS appears to have been effective in discriminating genuine ADHD participants from controls, although the Impulsivity/Emotional Lability failed to

discriminate these groups in both the male and the female samples. As a point of consideration, the CAARS was administered to the ADHD-Dx group as part of the comprehensive assessment. The extent to which clinicians' diagnoses relied on the CAARS is unknown. If relied on primarily, this would constitute criterion contamination. Therefore, the CAARS' ability to discriminate between the ADHD-Dx and Non-ADHD groups can only be viewed as promising.

Another self-report ADHD measure, the Wender Utah Rating Scale (WURS; Ward, Wender, Reimherr, 1993), was examined for discriminability between groups. In contrast to the CAARS, the WURS asks examinees to report on their childhood symptoms, retrospectively. The WURS clearly discriminated between genuine and feigned ADHD (see Table 10), with more than a ten-point discrepancy between their means. Interestingly, the simulators (ADHD-Sim) endorsed symptoms at a much higher frequency than those with ADHD (ADHD-Dx).

Table 9  
MANOVA Results Between Simulation and Genuine Groups Across CAARS Scales

CAARS Scales	Females								<i>F</i> 7.27	<i>p</i> <.001
	Simulation Groups				Genuine Groups					
	ADHD-Sim ( <i>n</i> = 17)		PSYC-Sim ( <i>n</i> = 18)		Non-ADHD ( <i>n</i> = 20)		ADHD-Dx ( <i>n</i> = 18)			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Inattention/Memory Problem	26.88 <sub>a</sub>	4.81	21.50 <sub>a</sub>	4.69	9.75 <sub>b</sub>	5.72	24.78 <sub>a</sub>	6.63		
Hyperactivity/Restlessness	29.06 <sub>a</sub>	4.84	14.28 <sub>b</sub>	10.0	13.25 <sub>b</sub>	7.01	25.22 <sub>a</sub>	7.57		
Impulsivity/Emotional Liability	23.12 <sub>a</sub>	4.81	15.78 <sub>b</sub>	6.89	9.75 <sub>c</sub>	5.34	18.56 <sub>a,b</sub>	7.99		
Problems with Self Concept	7.94 <sub>a</sub>	4.15	14.33 <sub>b</sub>	4.22	6.80 <sub>a</sub>	4.74	9.78 <sub>a</sub>	3.21		
Inattentive Symptoms	21.06 <sub>a</sub>	4.02	16.50 <sub>b</sub>	4.18	7.45 <sub>c</sub>	4.79	20.33 <sub>a,b</sub>	5.43		
Hyperactive-Impulse Symptoms	21.06 <sub>a</sub>	3.67	9.28 <sub>b</sub>	6.43	7.85 <sub>b</sub>	4.02	17.22 <sub>a</sub>	5.87		
ADHD Symptoms Total	42.12 <sub>a</sub>	7.19	25.78 <sub>b</sub>	8.59	15.30 <sub>c</sub>	7.46	37.56 <sub>a</sub>	9.65		
ADHD Index	22.53 <sub>a</sub>	3.71	18.39 <sub>b</sub>	3.60	11.35 <sub>c</sub>	5.38	21.11 <sub>a,b</sub>	4.91		

CAARS Scales	Males								<i>F</i> 3.70	<i>p</i> <.001
	Simulation Groups				Genuine Groups					
	ADHD-Sim ( <i>n</i> = 14)		PSYC-Sim ( <i>n</i> = 16)		Non-ADHD ( <i>n</i> = 8)		ADHD-Dx ( <i>n</i> = 19)			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Inattention/Memory Problem	25.64 <sub>a</sub>		17.31 <sub>b,c</sub>		9.25 <sub>c</sub>		23.16 <sub>a,b</sub>			
Hyperactivity/Restlessness	28.86 <sub>a</sub>		17.88 <sub>b,c</sub>		13.50 <sub>c</sub>		22.63 <sub>b</sub>			
Impulsivity/Emotional Liability	20.07 <sub>a</sub>		16.38 <sub>a,b</sub>		7.63 <sub>b</sub>		14.58 <sub>a,b</sub>			
Problems with Self Concept	7.64 <sub>a,b</sub>		12.00 <sub>a</sub>		6.00 <sub>b</sub>		11.68 <sub>a,b</sub>			
Inattentive Symptoms	20.64 <sub>a</sub>		14.56 <sub>b,c</sub>		8.50 <sub>c</sub>		18.53 <sub>a,b</sub>			
Hyperactive-Impulse Symptoms	19.43 <sub>a</sub>		11.38 <sub>b,c</sub>		6.75 <sub>c</sub>		12.68 <sub>b</sub>			
ADHD Symptoms Total	40.07 <sub>a</sub>		25.94 <sub>b</sub>		15.25 <sub>c</sub>		31.21 <sub>b</sub>			
ADHD Index	21.71 <sub>a</sub>		19.19 <sub>a</sub>		10.50 <sub>b</sub>		20.68 <sub>a</sub>			

*Note.* CAARS = Conners' Adult ADHD Rating Scales-Self-report: Long Version. Subscripts indicate significant differences based on Tukey's post hoc comparisons.

Research suggests scores  $\geq 46$  on the zero to 100 scale are indicative of a positive diagnosis of childhood ADHD (Ward, Wender, & Reimherr, 1993). The ADHD-Dx group's mean score was below the cut score, while the ADHD-Sim group's average clearly surpassed this threshold for ADHD. These results draw into question the accuracy of the WURS cut score for ADHD diagnosis. While no cut score is offered for over reporting of symptoms on this measure, any trend of unusually high scores (e.g., 1.5 standard deviations above the normative mean) should alert evaluators to be cautious in relying on this self-report data.

Table 10  
*ANOVA Results Between Simulation and Genuine Groups for the WURS Total Score*

	Simulation Groups				Genuine Groups			
	ADHD-Sim ( <i>n</i> = 26)		PSYC-Sim ( <i>n</i> = 35)		Non- ADHD ( <i>n</i> = 29)		ADHD-Dx ( <i>n</i> = 32)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
WURS Total	52.39 <sub>a</sub>	12.7	40.63	15.15	22.76 <sub>c</sub>	13.9	40.23	14.50
		2	b		8		b	

*Note.* Subscripts denote significant differences between groups. Sample sizes varied based on missing data.  $F = 20.54$ ,  $p < .001$ .

## Research Questions and Hypotheses

*Research Question 1: Will the ADHD-Sim Group be able to successfully feign ADHD on the TOVA?* A MANOVA was used to test the TOVA's vulnerability to feigning. The condition was the categorical independent variable with four levels (one for each group) and TOVA scores served as the continuous dependent variables.

Hypothesis 1 predicted that Lark et al.'s findings (Lark, Dixon, Hoffman, & Huynh, 2002) would be confirmed. Specifically, that significantly lower scores

would be observed for the ADHD-Sim group when compared to the Non-ADHD and ADHD-Dx groups on the Auditory TOVA's Omission scale, Commission scale, and Variability scale. Additionally, this study was the first to investigate how a PSYC-Sim group would perform on the measure, relative to other groups.

The MANOVA revealed significant differences between groups on the Auditory TOVA subscales,  $F(12, 320) = 9.46$ ,  $p = <.001$ ; Wilk's  $\Lambda = .458$ , partial  $\eta^2 = .235$ . LSD post-hoc analyses produced results closely matching Leary et al.'s (2002) findings and confirm Hypothesis 1 for these three scales (see Table 11). As predicted, the ADHD-Sim group performed the worst, with scores lower than even the PSYC-Sim group;  $d$ s ranged from -0.52 to -1.17. A similar pattern was observed across the Omission, Commission, and Response Time Variability subscales wherein the Non-ADHD group predictably performed the best, followed by the ADHD-Dx group, the PSYC-Sim group, and finally the ADHD-Sim group. As expected, both genuine groups (with and without ADHD) performed better than both simulation groups (regardless of whether they were feigning ADHD symptoms or general psychopathology).



Table 11

*Results from a MANOVA Examining Simulation and Genuine Group Differences on the Auditory and Visual TOVA Subscales*

	Simulation Groups				Genuine Groups			
	ADHD-Sim ( <i>n</i> = 32)		PSYC-Sim ( <i>n</i> = 35)		Non-ADHD ( <i>n</i> = 30)		ADHD-Dx ( <i>n</i> = 30)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Auditory								
OE	47.19 <sub>a</sub>	16.96	66.47 <sub>b</sub>	28.06	95.03 <sub>c</sub>	21.02	79.63 <sub>d</sub>	26.16
CE	57.75 <sub>a</sub>	22.27	69.97 <sub>b</sub>	24.40	96.83 <sub>c</sub>	18.93	85.66 <sub>d</sub>	21.63
RT	83.97 <sub>a</sub>	18.44	95.91 <sub>b</sub>	23.16	106.87	13.63	103.41 <sub>b,c</sub>	12.67
RTV	51.44 <sub>a</sub>	12.78	70.65 <sub>b</sub>	19.06	96.07 <sub>c</sub>	16.75	78.63 <sub>b</sub>	17.77
Visual	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
OE <sup>a</sup>	40.00 <sub>a</sub>	0.00	60.27 <sub>b</sub>	26.70	100.13	12.95	66.13 <sub>c</sub>	25.40
CE	73.97 <sub>a</sub>	24.76	80.27 <sub>a</sub>	22.69	105.00	8.21	94.13 <sub>c</sub>	16.39
RT	77.97 <sub>a</sub>	27.63	90.00 <sub>b</sub>	32.99	111.23	12.43	90.30 <sub>a,b</sub>	27.16
RTV	44.41 <sub>a</sub>	8.80	63.27 <sub>b</sub>	2.60	95.37 <sub>c</sub>	14.97	65.73 <sub>b</sub>	22.69
Total <sup>b</sup>	-11.12 <sub>a</sub>	6.93	-6.16 <sub>b</sub>	7.54	2.10 <sub>c</sub>	2.28	-5.18 <sub>b</sub>	6.37

*Note.* OE = Omission Errors; CE = Commission Errors; RT = Response Time; RTV = Response Time Variability, Total = Total Inattention Index. Different subscripts signify significant differences.

<sup>a</sup> A floor effect was observed for the ADHD-Sim group on the Visual OE scale, therefore the standard deviation was 0.00 and effect sizes could not be calculated.

<sup>b</sup> Total scores below zero suggest increasing levels of impaired functioning with scores less than 1.80 fitting the profile of an ADHD sample.

Wilk's Lambda reported for *F*. Auditory *F* = 9.46, *p* < .001; Visual *F* = 9.42, *p* < .001.

This investigation provides the first comparison of ADHD simulators to a group feigning general psychopathology, control participants, and a clinical comparison sample. ADHD-Sim participants, on all but one TOVA scale, performed worse than the PSYC-Sim sample. The PSYC-Sim participants performed consistently lower on the commission errors scales than the honest groups. In addition, the Auditory Omission Error subscale produced a moderate difference between simulated ADHD and generally feigned psychopathology (*d* = .49).

Importantly, the mean Total score for the Non-ADHD group was positive, which is indicative of non-impaired to minimally impaired functioning. Significant

differences had not emerged between groups on the Response Time (RT) subscale in previous literature; however, the current study results indicate the ADHD-Sim group performed significantly worse than all other groups for the Auditory test. The RT lacked discriminability, however, on the Visual TOVA.

Table 12

*Effect Sizes (Cohen's ds) for TOVA Subscales Across Simulation and Genuine Groups*

	ADHD-Dx vs. ADHD-Sim	ADHD-Dx vs. PSYC-Sim	ADHD-Sim vs. PSYC-Sim	Non-ADHD vs. ADHD-Dx	Non-ADHD vs. ADHD-Sim	Non-ADHD vs. PSYC-Sim
<hr/>						
Auditory						
OE	1.41	0.49	-0.82	0.63	2.51	1.14
CE	1.28	0.69	-0.52	0.54	1.89	1.22
RT	1.53	0.42	-0.57	0.27	1.41	0.57
RTV	1.70	0.44	-1.17	1.00	3.01	1.41
Visual						
OE <sup>a</sup>	NA	0.23	NA	1.57	NA	1.86
CE	1.01	0.72	-0.27	0.78	1.66	1.41
RT	0.45	0.01	-0.39	0.92	1.54	0.83
RTV	1.14	0.15	-2.97	1.47	4.18	3.11
Total	0.90	0.14	-0.68	1.39	2.53	1.44

*Note.* OE = Omission Errors; CE = Commission Errors; RT = Response Time; RTV = Response Time Variability, Total = Total Inattention Index (Only available for the Visual subtest).

<sup>a</sup> Effect sizes could not be calculated for this scale involving the ADHD-Sim group due to a floor effect on this scale and a subsequent standard deviation of 0.00.

The most important comparison is arguably between the ADHD-Sim and ADHD-Dx groups. This comparison provides information about whether the subscales can be “faked” convincingly or whether a feigned profile would be distinguishable from a genuine ADHD profile. In examining effect sizes to determine the magnitude of these differences, Cohen’s *ds* ranged from 1.28 to 1.70, suggesting the ADHD-Sim group performed appreciably poorer than the

ADHD-Dx group (see Table 12). The next logical step was to determine whether the ADHD-Sim and PSYC-Sim groups could be distinguished from one another. While statistically significantly different, the effect sizes are smaller, with  $d$ s ranging from -0.52 to -1.17. Perhaps the most promising scale is the Response Time Variability, as it distinguished PSYC-Sim from ADHD-Sim and produced an effect size of 1.70 between genuine and feigned ADHD.

Hypothesis 2 predicted similar trends for the Visual TOVA subtests as those confirmed for the Auditory TOVA subtests for Hypothesis 1. Although they generally corresponded, Hypothesis 2 predicted no difference between genuine and feigned ADHD on Visual subtests. As with the Auditory TOVA, the overall MANOVA for the Visual TOVA was significant,  $F(15, 326) = 9.42$ ;  $p < .001$ ; Wilk's  $\Lambda = .370$ , partial  $\eta^2 = .282$ . LSD post-hoc analyses indicated smaller differences than those observed for the Auditory subtests. This finding was expected based on Quinn's (2003) research, demonstrating superior discriminability for auditory than visual subtests.

Response Time did not follow the observed pattern for other TOVA subtests when comparing the ADHD-Sim and ADHD-Dx groups, producing a small  $d$  of only .45. However, in all other instances, the two were significantly different with  $d$ s ranging from 0.90 to 1.14. More specifically, the ADHD-Sim group performed more poorly than those individuals with a diagnosis of ADHD (ADHD-Dx), the same pattern found for the Auditory subtests. Interestingly, the simulation groups (ADHD-Sim and PSYC-Sim) were distinct from one another on all subtests except the Commission Errors subtest, an unexpected finding.

Although not significantly different, the average scores were still reflective of the pattern observed across other TOVA scales wherein the ADHD-Sim group performed worse than the PSYC-Sim group. Similar to findings from the Auditory TOVA, the ADHD-Sim group consistently performed worse than all other groups across the board.

The Response Time Variability subtest on the Visual TOVA produced some of the largest differences between groups (see Table 12). Overall, the effects produced by the Visual TOVA subtests between the ADHD-Dx and ADHD-Sim groups were slightly weaker than those produced by the Auditory TOVA. Still, they ranged from  $d = 0.45$  to  $d = 1.31$ , indicating moderate, yet impactful, differences between those with genuine ADHD and those feigning ADHD.

Hypothesis 3 expected the ADHD-Dx group would produce lower scores than the Non-ADHD group on all subtests, regardless of modality (Auditory or Visual). This hypothesis was confirmed for all subtests except Response Time on the Auditory TOVA, wherein the two groups were indistinguishable and produced a small effect size ( $d = 0.27$ ).

Research Question 2: *Which MMPI-2-RF validity scales will be more effective at detecting the ADHD-Sim and PSYC-Sim groups?* To address Research Question 2, a MANOVA was utilized to compare the four groups' performances on six MMPI-2-RF validity scales. Current results sharply conflict with Harp, Jasinski, Shandera-Ochsner, Mason, and Berry's (2011) findings. The Fs and K-r scales were the only two indicators that produced significant

differences between ADHD-Sim and ADHD-Dx groups (see Table 13).

Unfortunately, the ADHD-Sim group did not differ significantly from the PSYC-Sim group on these particular scales. In other words, these scales cannot discriminate between specific types of feigning.

Table 13

*MANOVA Results Between Simulation and Genuine Groups across MMPI-2-RF Validity Scales*

RF VI	Simulation Groups				Genuine Groups				<i>F</i> 4.50	<i>p</i> <.001
	ADHD-Sim		PSYC-Sim		Non-ADHD		ADHD-Dx			
	<i>(n</i> = 31)		<i>(n</i> = 35)		<i>(n</i> = 30)		<i>(n</i> = 36)			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
F-r	66.26 <sub>a,b</sub>	30.87	65.77 <sub>b,c</sub>	41.99	51.73 <sub>d</sub>	14.48	56.61 <sub>a,c,d</sub>	12.27		
Fp-r	62.71 <sub>a,b</sub>	26.44	79.14 <sub>c</sub>	33.00	56.23 <sub>b,d</sub>	12.55	54.31 <sub>a,d</sub>	11.17		
Fs	73.84 <sub>a</sub>	23.48	72.63 <sub>a</sub>	31.07	57.50 <sub>b</sub>	13.55	54.47 <sub>b</sub>	11.46		
FBS-r	60.52 <sub>a</sub>	12.06	74.31 <sub>b</sub>	15.37	55.53 <sub>a</sub>	11.77	60.75 <sub>a</sub>	11.22		
L-r	50.87 <sub>a,b</sub>	6.55	53.71 <sub>c,b,d</sub>	10.64	56.47 <sub>d,e</sub>	11.77	52.86 <sub>a,c,e</sub>	8.08		
K-r	40.35 <sub>a</sub>	8.35	37.46 <sub>a</sub>	11.14	46.80 <sub>b</sub>	10.28	45.44 <sub>b</sub>	7.74		

*Note.* RF VI = MMPI-2-RF Validity Indicators; F-r = Infrequent Responses; Fp-r = Infrequent Psychopathology Responses; Fs = Infrequent Somatic Responses; FBS-r = Symptom Validity; L-r = Uncommon Virtues; K-r = Adjustment Validity.

The overall findings for the MMPI-2-RF validity scales denote only moderate detection of feigned responses, whether they are general in nature or specific to ADHD. The PSYC-Sim group produced only moderate mean elevations ranging from 53.71 to 79.14 (with K-r excluded) on the MMPI-2-RF validity indicators, with ADHD-Sim producing even smaller means. These ADHD-Sim findings are not surprising, given these scales were designed to distinguish dissimulated responses from genuine responses, as opposed to detecting

specifically feigned disorders. However, the mean scores for the PSYC-Sim group were quite surprising.

Despite the lack of significance, effect sizes provide valuable insight into differences between genuine and feigned ADHD. Although the focus of this research question is the effectiveness of the validity indicators, descriptive data for the clinical scales broken down by group is available in Appendix I.

In general, the validity scales were ineffective in detecting simulated responses, as group means never surpassed  $T = 80$ , with only one scale even approaching 80. In fact, the ADHD-Sim group's scores on average ranged between 60.52 to 73.84 for "F family" scales. For detecting general feigning, it appears the Fp-r was the most discriminant, while very low scores on the K-r scale also appear to reflect dissimulated responses.

Harp et al.'s (2011) findings formed the basis for Hypothesis 4, which predicted the Fp-r would produce the largest effect size of any "F family" indicators between genuine and simulated ADHD groups. As noted in Table 15 below, the Fp-r did not produce the largest effect size because it remained only slightly elevated ( $M = 62.71$ ) for the ADHD-Sim group. Instead, the Fs Scale ( $d = -1.14$ ) yielded the largest effect size due to its moderate elevation ( $M = 73.84$ ) for ADHD simulators. This finding is particularly unexpected, because the Fs scale assesses infrequent somatic responses, a very different construct from ADHD. Not surprisingly, Fs produced virtually identical results between the ADHD-Sim and the PSYC-Sim groups ( $d = 0.04$ ).

Table 15

*Cohen's d Effect Sizes for MMPI-2-RF Validity Scales and the CII Across Simulation and Genuine Groups*

	ADHD-Dx	ADHD-Dx	ADHD-Sim	Non-ADHD	Non-ADHD	Non-ADHD
	vs.	vs.	vs.	vs.	vs.	vs.
	ADHD-Sim	PSYC-Sim	PSYC-Sim	ADHD-Dx	ADHD-Sim	PSYC-Sim
<b>MMPI-2-RF VI</b>						
F-r	-0.45	-0.32	0.01	-0.37	-0.60	-0.14
Fp-r	-0.46	-1.09	-0.55	0.16	-0.31	-0.89
Fs	-1.14	-0.84	0.04	0.25	-0.85	-0.62
FBS-r	0.02	-1.04	-0.99	-0.46	-0.42	-1.36
L-r	0.26	-0.09	-0.32	0.38	0.59	0.25
K-r	0.64	0.86	0.29	0.16	0.69	0.87
<b>CAARS</b>						
CII	-0.97	0.04	0.96	-1.70	-2.75	-1.54

*Note.* RF VI = MMPI-2-RF Validity Indicators; F-r = Infrequent Responses; Fp-r = Infrequent Psychopathology Responses; Fs = Infrequent Somatic Responses; FBS-r = Symptom Validity; L-r = Uncommon Virtues; K-r = Adjustment Validity; CAARS = Conner's Adult ADHD Rating Scales - Self-report: Long Version; CII = CAARS Infrequency Index.

Harp et al. (2011) also provided optimized cut scores to detect feigned ADHD for three "F family" scales: F-r  $\geq 70$ , Fp-r  $\geq 77$ , and Fs  $\geq 91$ . Their data indicated these cut points would achieve  $\geq .90$  specificity, reducing false alarms. Table 16 displays the effectiveness of their cut scores with current data. Encouragingly, two of the three cut scores met the stringent benchmark for specificity set forth by Harp et al. (2011), with the F-r achieving a slightly lower degree of specificity at .81. However, sensitivity was rather low across these three indicators. As a straightforward explanation, the current ADHD-Sim and



PSYC-Sim groups produced less extreme MMPI-2-RF over-reporting scale scores in general than did Harp et al.'s (2011) samples.

Table 16

*Utility Estimates of F Family Cut Scores Optimized for Feigned ADHD Across ADHD-Sim and ADHD-Dx Groups*

Indicator	Cut Score	Sens.	Spec.	OCC	15% base rate <sup>a</sup>	
					PPP	NPP
F-r	≥ 70	.58	.81	.70	.35	.92
Fp-r	≥ 77	.23	.92	.60	.32	.87
Fs	≥ 91	.29	1.00	.62	1.00	.89

*Note.* F-r = Infrequent Responses; Fp-r = Infrequent Psychopathology Responses; Fs = Infrequent Somatic Responses; Sens. = Sensitivity; Spec. = Specificity; OCC = Overall Correct Classification; PPP = Positive Predictive Power; NPP = Negative Predictive Power.

<sup>a</sup> For this investigation, we assumed that the overall rate of feigning would be 30% that would be equally divided between ADHD-Sim and PSYC-Sim.

Hypothesis 6 predicted the FBS-r scale would be effective at detecting generally simulated psychopathology (PSYC-Sim). Based on prior research (Harp et al., 2011), it was expected that the mean *T* score for the PSYC-Sim group on the FBS-r scale would be ≥ 80. Again, the current samples produced less elevated scores than those in Harp et al.'s (2011) study (refer back to Table 13). The mean score for the PSYC-Sim group was 74.31. Still, this group was statistically different than all other groups, as predicted. In terms of the magnitude of difference, when compared to the ADHD-Dx group, a Cohen's *d* of -1.04 was produced. In comparing the Non-ADHD group to the PSYC-Sim group

on this subscale, an effect size of -1.36 was produced. This was the largest effect noted between any groups on the validity scales and suggests this scale performs well at detecting general feigning.

*Research Question 3: Will the CAARS Infrequency Index (CII) be effective at detecting feigned ADHD?* The current study attempted to cross-validate Suhr, Buelow, and Riddle's (2010) findings regarding the effectiveness of their CII to identify feigners. The development of the CII is considered potentially valuable as a method of detecting feigned ADHD.

This current research is the first known study utilizing a simulation design to examine Suhr et al.'s (2010) CII cut scores to detect feigned ADHD. Prior to this analysis, the Cronbach's alpha for the CII was evaluated using the current data (genuine groups) and was found to be .83.

In examining group differences, a one-way ANOVA indicated overall significant differences between the four groups,  $F(3, 131) = 33.63, p = <.001$ . Tukey's HSD post-hoc analyses were conducted to provide information regarding which groups were statistically different from one another (See Table 17).

Tukey's post-hoc analyses indicated significant differences between (a) ADHD-Dx and ADHD-Sim, (b) ADHD-Sim and Non-ADHD, and (c) ADHD-Sim and PSYC-Sim. Therefore, it appears this measure has great potential for detecting feigned CAARS protocols. Additionally, effect sizes were calculated to determine the magnitude of difference between groups. Interestingly, the effect sizes were extremely similar in comparing differences between genuine ADHD and simulated ADHD ( $d = -0.97$ ), as they were for simulated psychopathology

and simulated ADHD ( $d = 0.97$ ). Virtually no effect was noted between ADHD-Dx and PSYC-Sim groups on the CII ( $d = 0.04$ ).

Table 17

*Group Differences on the Conner's Infrequency Index*

	Simulation Groups				Genuine Groups				<i>F</i>	<i>p</i>
	ADHD-Sim		PSYC-Sim		Non-ADHD		ADHD-Dx			
	<i>(n = 31)</i>		<i>(n = 35)</i>		<i>(n = 30)</i>		<i>(n = 37)</i>			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
CII	19.90 <sub>a</sub>	5.65	14.26 <sub>b</sub>	6.07	6.03 <sub>c</sub>	4.34	14.51 <sub>b</sub>	5.45	33.63	<.001

*Note.* CII = Conner's Infrequency Index

To examine Suhr et al.'s (2010) suggested gender-specific cut scores to address hypothesis 7, utility estimates were calculated using the ADHD-Sim and ADHD-Dx groups. As displayed in Table 18 below, the cut scores are lacking sensitivity (ranging from .38 to .59), but consistently maintain a specificity  $\geq .90$ . This appears to be a useful indicator, as feigning indicators aim to increase specificity to avoid misclassification. Of note, our ADHD-Dx sample was quite small when compared to the samples on which the CII was developed and validated. Our male and female groups both had 36 participants in them each, while the overall samples had 72 participants. Given the relatively small *ns*, the total sample was examined at both the female and male cut scores provided by Suhr et al. See Table 18 below for details.

Table 18

*Utility Estimates of the CII at Detecting Feigned ADHD Across ADHD-Sim and ADHD-Dx Groups*

	Cut Score	Sens.	Spec.	OCC	15% base rate	
					PPP	NPP
Males	≥ 21	.38	.95	.69	.57	.90
Females	≥ 20	.59	.90	.75	.50	.93
Overall	≥ 21	.51	.92	.74	.52	.92
Overall	≥ 20	.55	.90	.74	.49	.92

*Note.* Sens. = Sensitivity; Spec. = Specificity; OCC = Overall Correct Classification; PPP = Positive Predictive Power; NPP = Negative Predictive Power.

In contrast to Suhr et al.'s (2010) findings, the CII was far less effective with males than with females or with combined genders, producing a specificity of only .38. This may be due to variance in samples. For instance, in the current study ADHD-Dx female CII scores averaged 15.05 ( $SD = 6.07$ ), while males on average scored slightly lower at 14.00 ( $SD = 4.90$ ). This is the opposite of what would be expected based on Suhr et al.'s findings and subsequent gender-specific cut scores, as they found males to score higher than females on average. Thus, using the higher cut score of  $\geq 21$ , regardless of gender, appears most appropriate for our sample. This produces a high specificity (.92) while maintaining a moderate sensitivity (.51). However, due to the small sample size of the study, these results must be cautiously interpreted. Gender-specific cut scores need to be examined much more extensively, particularly with males, who in the current sample were difficult to classify.

#### Development of a Ds-ADHD Scale

*Supplementary Question 1: Is there an identifiable pattern of responses on the MMPI-2-RF to suggest a “fake bad” ADHD profile?* As an initial step in identifying a pattern of feigned responses on the MMPI-2-RF, participants from the three experimental groups identified items they perceived were related to ADHD. Specifically, they took note of which items they believed an individual with ADHD would mark “true.” Frequencies were inspected to determine which “ADHD-related” MMPI-2-RF items were endorsed. Average item scores (AIS) greater than 50.0% were identified. A total of 23 MMPI-2-RF items met this initial criterion. As a second step, those 23 items were examined to determine which of them were marked “false” (or a score of 2) in greater than 50.0% of the genuine ADHD sample (ADHD-Dx). A total of 10 items met both of these criteria (31, 40, 66, 119, 131, 167, 219, 223, 253, and 285). Next, these items were summed, with “true” answers receiving one point and “false” answers receiving two points, to create a Ds-ADHD scale. The items on this scale, on average, were wrongly endorsed as characteristic of ADHD by 61.5% of the participants in experimental groups.

Table 19

*Group Differences on Ds-ADHD Scale*

	Simulation Groups				Genuine Groups				<i>F</i>	<i>p</i>
	ADHD-Sim		PSYC-Sim		Non-ADHD		ADHD-Dx			
	<i>(n = 31)</i>		<i>(n = 35)</i>		<i>(n = 30)</i>		<i>(n = 36)</i>			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Ds-ADHD Scale	11.72 <sub>a</sub>	1.75	15.40 <sub>b</sub>	2.19	16.37 <sub>b</sub>	1.73	16.33 <sub>b</sub>	2.10	40.61	<.001

*Note.* Subscripts denote significant differences based on Tukey’s post-hoc comparisons. Ds-ADHD Scale = Dissimulation ADHD Scale.

*Supplementary Question 2: Will the Ds-ADHD scale be effective at identifying feigned ADHD?* Results from the ANOVA suggest there was an overall significant difference between groups on the Ds-ADHD scale  $F(3,129) = 40.61, p = <.001$ . Tukey's post-hoc analyses revealed the ADHD-Sim group was statistically different than all other groups, confirming the hypothesis put forth. The Ds-ADHD scale ranges in possible scores from 10 to 20. A Ds-ADHD score of 10 signifies false perceptions on all 10 Ds-ADHD items. As observed in Table 19, ADHD feigners tended miss 8 of the 10 items, whereas other groups had at least one-half of the Ds-ADHD items correct. With these promising results, a cut score was established to examine classification accuracy (See Table 20).

Table 20

*Utility Estimates of the Ds-ADHD Scale for ADHD-Sim Versus All Other Groups*

	Cut Score	Sens.	Spec.	OCC	base rate <sup>a</sup>	
					PPP	NPP
ADHD-Sim v. ADHD-Dx	<13	.75	.97	.87	.83	.96
ADHD-Sim v. PSYC-Sim	<13	.75	.89	.82	.87	.78
ADHD-Sim v. Non-ADHD	<13	.75	1.00	.87	1.00	.96

*Note.* Sens. = Sensitivity; Spec. = Specificity; OCC = Overall Correct Classification; PPP = Positive Predictive Power; NPP = Negative Predictive Power.

<sup>a</sup> For this investigation, we assumed that the overall rate of feigning would be 30% that would be equally divided between ADHD-Sim and PSYC-Sim. Therefore, a 50% base rate was used in the ADHD-Sim v. PSYC-Sim comparison, while a 15% base rate was used in the remaining comparisons.

An optimized cut score was produced that retained good sensitivity (.75) with excellent specificity (.89 to 1.00). Utilizing a cut score of <13 to indicate

feigning, ADHD simulators, as compared to those with genuine ADHD (ADHD-Dx), were overall correctly classified at a rate of 87.0%. Importantly, this cut score allows for a conservative approach to classification, limiting false positives with a specificity of .97. Furthermore, the scale holds up to the test of detecting feigned ADHD specifically, beyond general feigning. While the specificity drops slightly to .89 when comparing ADHD-Sim to PSYC-Sim profiles, the overall correct classification rate remains fairly high, at 82.0%, without compromising sensitivity. These results suggest the Ds-ADHD scale can be highly effective at detecting feigners.

*Supplementary Question 3: Will any gender differences exist between perceived ADHD items on the MMPI-2-RF?* Before examining gender differences on items believed to be associated with ADHD, it is important to consider how the sample as a whole selected the Ds-ADHD scale items. The ten selected items map onto a total of 13 different traditional scales, excluding response style scales. While some items only mapped onto a single scale (e.g., item 31 only loads onto the cognitive scale), most items load onto several different scales. Two scales appeared to have four items load onto them each. The behavioral/externalizing dysfunction scale (BXD) had four of the 10 Ds-ADHD scale items load onto it. This finding makes sense, given the behavioral symptoms associated with the disorder. The second scale was the Disconstraint scale (DISC-r), which also had four items from the Ds-ADHD scale load onto it. Again, this finding is not particularly surprising, given the Disconstraint scale measures one's tendency to be rebellious, unreliable, or to act out behaviorally.

Interestingly, a little over half of the items on the Ds-ADHD scale were reflective of attentional or cognitive symptoms of ADHD, while the remaining items appeared to be more behaviorally based symptoms (see Table 21). Three items (66, 223, and 253) were judged to be behavioral, five (31, 40, 119, 167, and 219) were judged to be attentional, and two (131 and 285) were judged to be an even combination.

Table 21

*Ds-ADHD Scale Item Endorsement by Gender*

Items	Attentional/Behavioral	Females	Males	Logit $d$	$r$
31.	Attentional	61.4	70.3	-0.22	-0.11
40.	Attentional	59.6	54.1	0.13	0.06
66.	Behavioral	73.7	83.8	-0.34	-0.17
119.	Attentional	52.6	59.5	-0.15	-0.08
131.	Attentional /Behavioral	73.7	56.8	0.42	0.20
167.	Attentional	49.1	70.3	-0.49	-0.24
219.	Attentional	57.9	67.6	-0.23	-0.11
223.	Behavioral	61.4	45.9	0.35	0.17
253.	Behavioral	56.1	54.1	0.05	0.02
285.	Behavioral/Attentional	64.9	59.5	0.13	0.06

*Note.* Items were independently rated by three doctoral psychology students and judged to be either primarily attentional, behavioral, or both. Inter-rater reliability was calculated with a mean Cohen's Kappa of .69.



Supplementary Hypothesis 2 suggested the items selected for the Ds-ADHD scale would come from the Activation, Cognitive Complaints, Hypomanic Activation, and the Emotional/Internalizing Dysfunction scales. Results suggest this hypothesis was supported as two items came from the Activation scale, one item came from the Cognitive Complaints scale, two items came from the Hypomanic Activation scale, and two items came from the Emotional/Internalizing Dysfunction scale. Of the 13 scales onto which the 10 Ds-ADHD scale items load, eight are considered to measure behavioral traits, whereas the remaining five measure more internal experiences. Hypotheses 3 and 4 predicted females would endorse the cognitive items at a higher rate than males, while males would tend to select items more behavioral in nature. To test these hypotheses, the sample was divided based on gender. Then, frequencies were produced for the 10 scale items separately for each gender. Next, item percentages were compared and examined to determine whether any patterns emerged regarding the endorsement of attentional or behavioral items and the gender of the rater.

Hypotheses 3 and 4 were refuted, as most items - regardless of the gender of the rater - were endorsed at a similar rate. Furthermore, in the few cases where an item was endorsed at a noticeably higher rate than the other gender, it was typically not in the expected direction. This data reveals that although females with ADHD are more often diagnosed with inattentive type as compared to their male counterparts, this may have little influence on the items they perceive to be related to ADHD.

## CHAPTER 4

### DISCUSSION

The detection of feigned mental illness has been a topic of study since the early nineteenth century. In a review of early case studies, Geller, Erlen, Kaye, and Fisher (1990) highlighted possible indicators of malingered mental illness. These feigning characteristics included an unusually rapid onset of symptoms, “overacting” the part, and displaying “over the top” symptoms particularly when being observed. Lastly, they opined that feigning was also characterized by unexpected global memory deficits and intact personal relationships (i.e., positive family and friend relationships). As summarized by Rogers and Correa (2008), these specific indicators could be categorized into four primary tactics of detection: (a) interviewee behavior (b) feigned presentation of symptoms, (c) observed areas of intact functioning, and (d) uncharacteristic symptoms. According to Geller et al. (1990), early nineteenth century evaluators also included taking writing samples and repeating questions to examinees (i.e., looking for identical responses rarely observed in acutely disordered individuals), as part of their interventions to detect feigned mental illness.

Marking the beginning of the modern era of detecting feigned mental disorders, Rogers (1984) condensed down the main clinical indicators of malingering gathered from case studies. They were broken down into: (a) extreme severity of symptoms, (b) inconsistencies between report and observation, (c) willingness to talk about impairment, (d) sudden onset of symptoms, and (e) the sequential nature of symptoms. Noting the value of

information gleaned from case studies, Rogers and Correa (2008) also recognized the limitations in attempting to develop standardized detection methods from case study data.

Rogers and Correa (2008) documented the first major movement of the development of standard validity scales beginning with the original Minnesota Multiphasic Personality Inventory (Hathaway & McKinley, 1940). Importantly, in the 1990s, researchers began advocating for empirically based detection strategies (Rogers, Harrell, & Liff, 1993). Rogers (2008) published an outline of specific detection strategies separately for feigned cognitive impairment and feigned mental disorders. Rather than simply observing group differences, Rogers and Correa (2008) recommended “detection strategies require a conceptually based, multi-method validation with an emphasis on large effect sizes and accurate classification of feigning and genuinely impaired samples” (p. 218).

Most recently, a new movement has emerged toward the identification of specifically feigned syndromes (e.g., posttraumatic stress disorder or PTSD) in the literature. Leading this movement, Elhai, Ruggiero, Frueh, Beckham, Gold, and Feldman (2002) developed the MMPI-2 Infrequency-Posttraumatic Stress Disorder scale (Fptsd) with promising results for specifically discriminating feigned PTSD from other feigned disorders. In more recent years, there has been an increase in mental health professionals’ awareness that Attention Deficit Hyperactivity Disorder (ADHD) fits into the category of illnesses faked for personal gain. This amplified attention to feigned ADHD is most notable in the

increase in research studies since Quinn's (2003) initial project, which specifically examined ADHD feigning in adults. The current study continues this effort toward identifying feigned ADHD specifically, while implementing two simulation groups in its methodology.

### Detecting Feigned ADHD

ADHD researchers have only recently begun systematically examining potential tools for detecting feigned ADHD. In sharp contrast, ADHD feigners have long possessed broad and easy access to the World Wide Web with its "how to" instructions for obtaining an ADHD diagnosis. For example, one satirical website ([www.exiledonline.com](http://www.exiledonline.com)) wrote an article including advice such as, "The main thing is not to overdo it..." It goes on to discuss how simulation of attention problems should be portrayed as decreasing the feigner's quality of life. Despite its somewhat sarcastic approach, the website lists sample questions and answers, and offers advice on how to appear impaired by ADHD, but not overly impaired (e.g., reporting some academic difficulties but not extreme difficulties). The availability of material pertaining to successfully faking ADHD is likely reflective of a perceived demand for it. With its easy availability, these directions may be one contributing factor in successful feigning.

From a research perspective, several additional known factors have likely contributed to the prevalence and success of feigned ADHD. Among motivations to obtain an ADHD diagnosis, perhaps the most prominent enticement is access to stimulant medication that constitutes a standard pharmacological treatment for the disorder (Mehta et al., 2000). Indeed several studies have documented the

dramatic increase in stimulant medication prescriptions across the U.S. within the last several years (Olfson, Gameroff, Marcus, & Jenson, 2003; Robinson, Sclar, & Skaer, 2005). While stimulant medications can improve attention and alertness for persons with ADHD when used appropriately, they may also be abused for an academic advantage (Barrett, Darredeau, Bordy, & Pihl, 2005) or for recreational purposes as an inexpensive, prescription-based alternative to cocaine (Babcock & Byrne, 2000; Ziegler, 2000). The potential for stimulant abuse, as well as for psychological and physical dependency, is so great that the U.S. Drug Enforcement Administration (DEA) classifies these substances as Schedule II substances (Woodworth, 2000). Schedule II substances are considered to have substantial potential for abuse, which could lead to severe physical or psychological dependence (U.S. Department of Justice Drug Enforcement Administration, 2015). As a point of comparison, common Schedule II substances also include opium, morphine, and hydrocodone.

According to psychological surveys, the illegal abuse of stimulant medications became increasingly popular in the 1990s on college campuses in the U.S. (Babcock & Byrne, 2000). As previously noted, in a 2008 survey conducted by DeSantis, Webb, and Noar, a staggering 34.0% of their university sample claimed to have abused ADHD medication without a prescription. Despite an overall decrease in the types of illicit substances abused by high school seniors, ADHD medication stimulants have strongly run counter to this trend, with substantially increasing abuse rates (National Institute on Drug Abuse, 2014). The most recent statistics published by the National Institute on Drug Abuse

indicate a steady increase in American high school seniors abusing the prescription drug Adderall since 2013 ([www.drugabuse.com](http://www.drugabuse.com)).

Young adults may also be motivated to feign ADHD to receive accommodations within their higher education institutions (Harrison, 2006). For many years it has been routine for universities to provide students with disabilities, such as ADHD, with extra time on written exams, selective seating, reduced homework, availability of additional notes, and additional clarification of instructions (McGuire, 1998; Nelson, Whipple, Lindstrom, & Foels, 2014). These advantages may be a highly motivating factor in some college students seeking ADHD diagnoses, particularly if they are at an academically demanding institution or are experiencing academic difficulties.

A third factor contributing to feigned ADHD involves the lack of systematic approaches for its detection. As highlighted in the Introduction, most ADHD specific assessment instruments do not assess for fabricated or exaggerated symptoms. Furthermore, there are virtually no established measures or methods available that have been specifically validated to assess feigned ADHD (Booksh, Pella, Singh, & Gouvier, 2010), with only preliminary research available to date (Harp, Jasinski, Shandera-Ochsner, Mason, & Berry, 2011; Harrison, Edwards, & Parker, 2007; Suhr, Buelow, & Riddle, 2010). Additionally, with the recent changes in the Diagnostic and Statistical Manual (DSM-5; American Psychiatric Association, 2013), the criteria for ADHD have been expanded, essentially making it easier to receive this diagnosis. In particular, the age of onset has been increased from seven to 12-years-old, and the symptom threshold has

been reduced from six to five symptoms in either domain required for diagnosis. Furthermore, for adults presenting for ADHD evaluations, school records are not always available and often depend on the client's cooperation.

ADHD appears highly susceptible to feigning because of the nature of the diagnosis. From a diagnostic perspective, it is characterized an unclear etiology, a lack of distinct and decisive symptoms, vague diagnostic criteria, and a heavy reliance on self-reported experiences (Quinn, 2003). From a societal standpoint, ADHD has a relatively high level of social acceptance when compared to other mental disorders (Harrison et al., 2007). Considering the high stake consequences of potential stimulant abuse and total misappropriation of limited academic and health care resources, it is imperative to increase our efforts at maximizing clinicians' accuracy in the diagnosis of ADHD in adult populations. The following discussion sections will highlight how the current project has addressed the robustness of existing ADHD-specific instruments to feigning (including self-reports and continuous performance tests). It also addresses the utilization of non-ADHD specific measures in detecting feigned ADHD and the potential usefulness of the newly developed Ds-ADHD scale.

### Feigning on ADHD-specific Assessment Measures

#### Self-Report Instruments

Self-report instruments are often utilized as the most relevant and sometimes only available source of information used to establish a diagnosis of ADHD (Gualtieri & Johnson, 2005; McGough & Barkley, 2004). However, research has confirmed time and again that the reliance on self-reported ADHD

symptoms is obviously problematic in obtaining an accurate diagnosis in adult populations (Murphy, Gordon, & Barkley, 2000). The inaccuracies arise primarily from two sources. The first involves the lack of validity indicators included on self-report measures of ADHD. The second pertains to the face validity of both current and childhood ADHD symptom reports, as highlighted by Quinn's (2003) initial research on feigned ADHD. As an exception, the Conners' Infrequency Index (CII) was developed by Suhr et al. (2010). It represents the only published attempt to assess potentially exaggerated or fabricated symptoms on an ADHD-specific self-report measure, the Conners' Adult ADHD Rating Scale (CAARS; Conners, Erhardt, & Sparrow, 1999).

As summarized in the Introduction, the Conners' Infrequency Index (CII) was developed by utilizing infrequently endorsed items in genuine populations with ADHD to detect feigning via "high symptoms reports" (p. 160). Their results showed potential, as the CII demonstrated reasonable sensitivity in detecting simulated ADHD. As expected, the authors called for further validation. In keeping with that request, the current study evaluated the utility of the CII in detecting feigned ADHD via a simulation design. Current data add partial support and partial caution for the use of the CII in detecting feigned CAARS protocols. In support, the CII proved moderately effective in distinguishing between genuine and faked ADHD symptoms ( $d = -0.97$ ). However, the CII was unable to distinguish ADHD-specific feigning from general feigning. In other words, clinicians cannot specifically apply the CII to the determination of feigned ADHD. Examinees may produce similar scores if feigning anxiety or depression.



Typically, clinicians would be concerned for an ADHD feigning scale lacking discriminability between feigned ADHD versus feigned anxiety or depression. In the case of the CII however, it seems less pertinent because the entire measure is geared to assess ADHD and no other disorders. Nonetheless, it would be an overstatement to indicate the CII accurately detects feigned ADHD because its cut scores also classify other feigners. Thus, if an individual is presenting for an ADHD evaluation, the CII would be useful in determining whether that individual was responding genuinely or not. Additional testing and collateral sources of information would be required to determine whether they were attempting to feign ADHD versus another disorder.

Suhr et al. (2010) also provided gender-specific cut scores for determining feigning. Unfortunately, dividing the current small samples by gender reduced the power of the analyses, making accurate utility estimates impossible. As a result, the cut scores are provided for both genders. Current data suggested that the slightly higher cut score ( $\geq 21$ ) provided by Suhr et al. (2010) produced a high specificity of .92 across genders without diminishing its moderate sensitivity at .51. Overall, the CII appears useful in its ability to detect non-genuine symptom reports. Although alone it is not sufficient to determine ADHD feigning, it definitely has utility as an appropriate tool to be used in conjunction with other assessments to determine the validity of an individual's reported ADHD symptoms.

Continuous Performance Tests

A frequent approach to ADHD diagnosis in adults involves the use of continuous performance tests or CPTs (Cohen & Shapiro, 2007). CPTs are widely viewed as much less face-valid than self-report inventory measures, and therefore, are believed to be less susceptible to feigning (Quinn, 2003). Despite its supporters, several scholars have questioned the ecological validity of CPTs (Barkley, 1991; DuPaul, Anastopoulos, Shelton, Guevremont, & Metevia, 1992). The research on the effectiveness of CPTs to accurately diagnose adult ADHD is not entirely congruent, as discussed in the Introduction chapter; however, using CPTs for diagnostic purposes remains a common practice.

Sollman, Ranseen, and Berry (2010) reported limited utility for CPTs in distinguishing genuine from feigned ADHD in a college student population. In contrast, Quinn (2003) found a CPT easily distinguished those feigning ADHD, from those with genuine ADHD, and from those without ADHD answering honestly. Importantly, only one published study (Leark, Dixon, Hoffman, & Huynh, 2002) has examined the Test of Variables of Attention (TOVA; Greenberg, Kindschi, Dupuy, & Corman, 1996) with regard to feigning, despite its frequent clinical use in diagnosing ADHD. Further, that published study only examined test order effects, entirely lacking comparisons to a control group or a genuine ADHD group. Therefore, the current study began to address this gap in the literature by comparing performances on the TOVA of control (Non-ADHD) and clinical (ADHD-Dx) samples, while contrasting them to a feigning sample (ADHD-Sim). The PSYC-Sim serves as a near neighbor comparison for the ADHD-Sim group.

Similar to Lark, Dixon, Hoffman, and Huynh's (2002) findings, the present study's data found individuals feigning ADHD performed significantly worse than controls or those truly diagnosed with the disorder. Nevertheless, they tend to "overshoot the mark" by feigning so extremely that they appear unrealistically impaired. This consistent pattern was observed across Omission, Commission, and Response Variability subscales on the Auditory TOVA. Not only statistically significant, but the differences between feigned and genuine ADHD also appear clinically meaningful when examining the very large effect sizes, which ranged from 1.41 to 1.70 on the Auditory portion. Interestingly, generally small effects were noted between Non-ADHD and ADHD-Dx ( $d$ s from 0.27 to 1.00 on Auditory). In fact, slightly larger differences were observed between the simulation groups (ADHD-Sim and PSYC-Sim). This may add support for arguments against using CPTs or the TOVA specifically in ADHD evaluations, as one would expect the instrument to more strongly discriminate between those with and without the disorder. On both the Auditory and Visual TOVA scales, the Response Time Variability scale consistently produced the largest effect sizes and discriminability across all groups.

The current study was pioneering in evaluating how individuals feigning general psychopathology would perform on the TOVA. Interestingly, general feigners (PSYC-Sim) performed more poorly than both of the genuine samples (Non-ADHD and ADHD-Dx) but not as poorly as the ADHD simulators. Still, establishing optimized cut scores for feigned ADHD proved difficult. As previously noted, variability in response time on the TOVA yielded very large

effect sizes, and use of the Auditory and Visual was believed to have potential advantages over reported symptoms because it directly assesses attentional abilities. However, many participants across groups responded swiftly with little variability to the TOVA items. In viewing the distribution of scores, cut scores were established that retained all the ADHD-Sim group (sensitivity = 1.00). Using an Auditory RTV cut score of < 76 and a Visual RTV cut score of < 68 produced specificities of .50, with positive predictive powers of .26 for both. Unfortunately, the sensitivities were unexceptional and did not effectively differentiate between the two groups of simulators (A-RTV with a .44 specificity and V-RTV with only .16 specificity). Nevertheless, evaluators may consider scores above the cut scores as likely indicative of genuine effort on the TOVA's highly repetitive attentional tasks.

#### Feigning ADHD on the MMPI-2-RF

Beyond ADHD-specific measures, emerging research has recommended utilizing multiscale personality inventories to detect feigned ADHD. For example, Harp et al. (2011) compared ADHD simulators to an ADHD clinical group, and a genuine control group (no ADHD diagnosis). A few validity indicators on the MMPI-2-RF (Ben-Porath & Tellegen, 2008) showed potential for discriminating between the groups. They published their preliminary cut scores that were derived for optimal classification of feigned ADHD based on their data for three "F family" scales (F-r, Fp-r, and Fs). The current study aimed to replicate their results and potentially cross-validate their cut scores.

In contrast to Harp et al. (2011), only Fs of the “F family” indicators produced a significant difference between genuine and simulated ADHD in the current study ( $d = -1.14$ ), with one additional validity scale (K-r) distinguishing these groups to a lesser degree ( $d = 0.64$ ). Even more unfortunate, those two scales did not distinguished between feigned ADHD and general feigning, meaning that although they may be useful in detecting dissimulated responses, they cannot be used to detect ADHD feigning specifically.

In comparing the magnitude of differences between Harp et al.'s (2011) data and current data, it appears their sample was somewhat less sophisticated in their approach to feigning, producing large differences between feigned and genuine ADHD samples. As an example, Harp et al.'s data produced an effect size of -1.19 between control and feigning groups on the F-r scale, while current data produced a smaller effect of -0.60. Similarly, they found a larger effect size of -0.77 between genuine and feigned ADHD on F-r than the -0.45 produced in the current study's sample. Harp et al. (2011) investigated further the potential usefulness of the indicators via cut scores.

In an attempt to find utility in the existing MMPI-2-RF validity indicators to detect feigned ADHD, Harp et al. (2011) utilized their revised Fp-r, F-r, and Fs cut scores, based on the data from their study. Overall, these cut scores did not produce the classification rates expected (OCC rates ranging from .60 to .70 in the present study). Harp et al. determined their cut scores to ensure excellent specificity ( $>.90$ ); however, this resulted in modest sensitivity for the validity

indicators, ranging from 36.4 on the Fs to 63.6 for Fp-r. This was only slightly higher than findings from current data, with sensitivities ranging from .23 to .58.

The most logical reason for the differences between current findings and Harp et al.'s (2011) is that Harp's participants produced more highly elevated validity scores than the present study's samples. This may have been due to varying instruction components, as Harp's study did not include a caution to participants about being detected. It is also a possibility that the scores were dissimilar just based on the individual differences in participants.

The take home message for the use of MMPI-2-RF validity indicators, is that it is generally not supported and not reliable enough to draw conclusions absent any other information regarding whether a person is attempting to feign ADHD. This holds true regardless of whether traditional cut scores or optimized cut scores are being utilized.

To more fully explore the utility of the MMPI-2-RF in detecting feigned ADHD, the clinical scales were examined for each group (see Appendix I). Of the Higher-Order scales, the Behavioral/Externalizing Dysfunction (BXD) produced the largest differences between genuine and simulated ADHD (ADHD-Dx  $M = 53.47$ ; ADHD-Sim  $M = 71.00$ ). The derivatives of this Higher-Order scale are the Restructured Clinical (RC) Scales RC4 and RC9. In examining those RC scales, unsurprisingly they produced the largest disparities between genuine and feigned ADHD group means, relative to all of the RC scales. Some of the items that comprise these RC scales and BXD Scale are also found on the Ds-ADHD scale due to their ability to discriminate between

simulated and genuine presentations of ADHD. Of the revised Personality Psychopathology Five scales, Disconstraint (DISC-r) appears most effective in discriminating feigned ADHD from a genuine report of symptoms.

Cut scores were not established for MMPI-2-RF clinical scales; however, this may shed light on a potential innovative approach to identifying individuals feigning ADHD symptoms. It may benefit evaluators to note when the four previously discussed scales appear elevated, as current data is suggestive that individuals with genuine ADHD may not elevate on these scales. The idea of using a non-ADHD-specific measure to detect feigned ADHD is appealing, which prompted the development of the Ds-ADHD scale.

The development of the Ds-ADHD scale is perhaps the most important contribution of this dissertation to the literature. The results indicate using a Ds-ADHD scale cut score of  $<13$  to detect feigned ADHD as opposed to genuine ADHD produced a respectable overall classification rate of .87, while maintaining a specificity of 1.00, eliminating false-positives. The differences in average scores between those with ADHD ( $M = 16.33$ ) and those faking ADHD ( $M = 11.72$ ) was quite large, producing an impressive effect size of 2.39. In other words, participants in the ADHD-Sim group, on average, had eight out of ten misconceptions about symptoms endorsed by those with genuine ADHD.

The mean scores and effect sizes indicate excellent discriminability between genuine and feigned ADHD; yet, determining whether the scale is detecting feigned ADHD specifically is perhaps even more important. Findings show the Ds-ADHD scale performed extremely well in discriminating feigned

ADHD from feigned psychopathology in general (PSYC-Sim). The scale maintained a sensitivity of .75 in comparing the simulation conditions (ADHD-Sim and PSYC-Sim) with only a slight decrease in the overall correct classification rate to 82.0%. This adds substantial support for the Ds-ADHD scale's use in distinguishing simulated ADHD profiles. Although it will require cross-validation, the Ds-ADHD scale has immense potential in providing a much-needed assessment tool for clinicians to include in their standard ADHD evaluation batteries. This scale's development also highlights the potential benefits of utilizing a formal detection strategy to distinguish controls and general feigners from those feigning a specific disorder.

#### Detection Strategies

As an overview, Rogers (2008) categorized detection strategies for feigning into two main domains: (a) amplified symptom presentations and (b) unlikely symptom endorsement. Detection strategies based on amplified presentations emphasize how frequently or intensely symptoms found in genuine clinical populations are reported. The five detection strategies based on this approach include (a) indiscriminant symptom endorsement, (b) symptom severity, (c) obvious symptoms, (d) reported versus observed symptoms, and (e) erroneous stereotypes (Rogers & Bender, 2013). Please reference Appendix K for more detailed information as needed.

#### Amplified Detection Strategies for Feigned ADHD

The existing literature on feigned ADHD as well as current results highlight potential usefulness of several amplified detection strategies. For example, the



CAARS manual (Conners et al., 1999) recommends clinicians closely examine *T* scores greater than 80 for potential evidence of over-reporting. *T* scores on the CAARS range from 0 to 90<sup>2</sup>, meaning scores >80 indicate the examinees scored at or above 88.0% of the highest score possible. Categorized as an amplified detection strategy, this approach is known as *symptom severity*. Feigners are identified by reporting an unrealistic number of symptoms as being extremely impairing or intense. This strategy is distinguished from *symptom selectivity* (or *indiscriminant symptom endorsement*), wherein feigners endorse a large proportion of symptoms. In contrast, symptom severity focuses on reports of often "unbearable" intensity reportedly associated with the examinee's symptoms.

Similar to the caution provided by the CAARS manual (Conners et al., 1999), this study's results highlight the theme of feigners over-reporting on the TOVA when compared to students with genuine ADHD symptoms. Indeed, focusing on symptom severity may be more effective than other strategies (such as symptom selectivity). It is perhaps a practical detection strategy for feigned ADHD specifically because the symptoms of ADHD are so well known by individuals in the general public (Murphy, 1994), while the severity with which genuine ADHD patients experience the symptoms is less well known.

Another amplified detection strategy that may be useful in detecting feigned ADHD is described as the *reported versus observed symptoms* strategy. This strategy is best exemplified by the Reported versus Observed Symptoms scale on the Structured Interview of Reported Symptoms, Second Edition (SIRS-

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<sup>2</sup> Per the CAARS manual, all scores  $\times$  90 are recorded as 90.

2; Rogers, Sewell, & Gillard, 2010). Essentially, this strategy compares an examinee's self-reported impairment to clinical observations by psychologists and collateral sources. When a pattern of inconsistencies emerges, such as the examinee consistently reporting more impairment than other data sources suggest, one conclusion may be the individual is feigning.

Currently, ADHD measures and feigning scales do not directly utilize this strategy. However, self-report ADHD measures often have collateral versions completed by other reporters. For example, using the Wender Utah Rating Scale (WURS; Ward, Wender, & Reimherr, 1993) examinees rate their ADHD childhood behaviors, and when possible, a parent or caregiver also rates the same childhood behaviors. In instances where the examinee reports much more impairment than is observed by the clinician or reported by others, feigned ADHD must be considered.

As a caution, utilizing collateral information is most effective when the evaluator directly attains information from the collateral source (e.g., in person or phone interview). Several collateral instruments are in a simple checklist format that could easily be sent home with the examinee. However, in instances where feigning ADHD is suspected, it would be most helpful to ensure the information provided is actually from the collateral source, rather than completed by an examinee who is motivated to appear consistently impaired. Additionally, in cases where the examinee and their collateral sources provide conflicting reports, seeking another informant may be helpful in clarifying the discrepancies.

Unlikely Presentation Detection Strategies for Feigned ADHD

In contrast to the amplified detection strategies, unlikely detection strategies focus on the occurrence of unusual or atypical symptoms that are generally not found in genuine clinical populations. Five detection strategies are based on unlikely presentations of symptoms, including (a) rare symptoms, (b) quasi-rare symptoms, (c) symptom combinations, (d) improbable symptoms, and (e) spurious patterns of psychopathology (Rogers and Correa, 2008).

Suhr et al.'s (2010) CII was developed as the first ADHD feigning measure to utilize an unlikely symptoms strategy. Specifically, the authors report they used a rare symptoms strategy to develop the CII. A rare symptom detection strategy can be described as symptoms of psychopathology frequently reported by feigners but infrequently endorsed in genuine clinical populations (Rogers, 2008). Although all of the items included in the CAARS (Conners et al., 1999) are reportedly related to ADHD, Suhr et al. found some were very infrequently endorsed by individuals with genuine ADHD diagnoses.

The Ds-ADHD scale developed by the current study utilizes an erroneous stereotype strategy. That is, it utilizes a detection strategy wherein feigners are detected by their endorsement of items commonly but erroneously perceived to be related to a specific disorder, such as ADHD in this case. Ds-ADHD items were mistakenly believed to be related to ADHD, but in fact were only endorsed at lower levels (less than half) in the genuine ADHD group.

As noted by Gillard and Rogers (2010), one strength of erroneous stereotypes as a specific detection strategy is its lack of transparency and resistance to preparation. In fact, this held true in the current study. Despite

participants being provided with information regarding accurate ADHD symptoms (i.e., coaching), they were still tripped up by their ADHD misconceptions.

Resistance to coaching is extremely important in the detection of feigned ADHD (Harrison et al., 2007). This is particularly true because the general public are often exposed to articles and books describing the syndrome. Additionally, they have easily accessible Internet information regarding the symptoms and measures used to assess ADHD (Conti, 2004).

### Professional Implications

The Ds-ADHD scale represents an important first step in detecting feigned ADHD on the MMPI-2-RF. Consideration must also be given to when it is appropriate to utilize the Ds-ADHD scale and other tools for the detection of feigned ADHD. The literature (Quinn, 2003) recommends assessment of feigned ADHD symptoms should be routinely included in ADHD assessments, particularly because of potential incentives, such as academic accommodations or desired prescription stimulants (Jasinski, Harp, Berry, Shandera-Ochsner, Mason, & Ranseen, 2011; Suhr et al., 2008). Several researchers have offered specific recommendations for improving the accuracy of ADHD diagnoses, as summarized below.

Jasinski et al. (2011) encouraged clinicians to include at least two symptom validity tests (SVTs) in their standard battery for ADHD assessments. Research (Bigler, 2006; Mittenberg, Patton, Canyock, & Condit, 2002) suggests referral sources may influence clinician decision outcomes for malingering, so they should be considered whenever an examinee is referred for an ADHD

assessment. Furthermore, Surh et al. (2008) highlight the importance of documenting information about potential secondary gain in the charts of patients presenting for ADHD evaluations.

Harrison et al. (2007) recommended looking for patterns of “exaggerated high scores” on the CAARS in conjunction with “exaggerated low scores” on other standardized tests to identify feigned ADHD, although no score ranges were specified for qualifying as “high” or “low” scores. Quinn (2003) outlined specific score ranges and postulated CPT scores below three standard deviations are indicative of feigning ADHD. Fisher and Watkins (2008) stress the importance of not solely relying on rating scale data and encourage postsecondary institutions to consistently require multiple sources of information for diagnosis. Booksh et al. (2009) advised viewing students who perform in the “extremely impaired range” on CPTs cautiously.

No standard batteries exist for evaluating and providing an accurate diagnosis of ADHD. However, in moving forward, it is recommended that evaluators take steps to consider potential screens and potential indicators of feigned ADHD. Table 22 below highlights recommended methods for evaluating feigned ADHD through formal assessment (i.e., not just considering referral source, or self-reported extreme impairment, etc.).

Table 22

*Suggested Assessment Methods of Evaluating Feigned ADHD*

Method	Screen	Potential Indicator
CAARS $T > 80$	X	
CII $\geq 21$		X
TOVA V-OE $T \leq 40$	X	
CPT $T < 3 SD$	X	
Ds-ADHD		X

*Note.* CAARS = Conners Adult ADHD Rating Scale  $T$  score; CII = Conners Infrequency Index; TOVA V-OE = Test of Variables of Attention, Visual, Omission Errors; CPT = Continuous Performance Tests;  $SD$  = standard deviation.

For measures to be considered screens for feigned ADHD, research must have indicated significant differences between genuine and feigned ADHD performances. However, it was not necessary that these screens be theoretically based. For potential indicators, the two scales were specifically developed utilizing specific detection strategies.

Psychologists and other mental health professionals often function as gatekeepers to ensure individuals receive accurate diagnoses and therefore have appropriate access to resources. For example, many educational institutions will not provide accommodations to students without a psychological report indicating the presence of a diagnosis and recommendations for specific accommodations. Conversely, accurate diagnoses can limit inappropriate allocation of resources, potentially decreasing the availability of stimulant medications often abused across American college campuses. This project does not suggest a specific ADHD assessment battery to make a determination of

feigned ADHD, as discretion is left to individual evaluators. However, clinicians are encouraged to consider the aforementioned screens and potential indicators, in conjunction with the presence of a secondary gain while conducting these evaluations.

### Limitations

The current study was a systematic investigation of various assessment instruments' across three major domains: ADHD self-reports, CPTs, and more broadly, a multi-scale inventory (MMPI-2-RF). Specifically, it detailed these instruments' abilities to detect feigned ADHD. In addition, it applied the detection strategy of erroneous stereotypes for the development of the Ds-ADHD scale. Despite its methodological strengths, several limitations must be acknowledged. First issues with the sample are addressed.

The largest limitation involves the lack of a genuine group of participants with diagnosed psychological disorders. A psychological-genuine (PSYC-Gen) group would allow for direct comparisons between feigned ADHD and genuine psychopathology to determine the accuracy with which the Ds-ADHD scale would discriminate these individuals. This would add additional support for use of the Ds-ADHD scale in specifically detecting feigned ADHD. Given the Ds-ADHD scale's resistance to the PSYC-Sim group, it is expected that the scale would also accurately classify a PSYC-Gen group.

The ADHD-Dx sample stresses real-world practices in which the ordering of psychological measures varies across clinicians and their examinees. Because this sample was provided via archival data, there was no control for

which tests or in what order they were administered. It was difficult to find single archival participants who had completed all the desired measures of interest and therefore, the sample included several additional individuals (with some having completed one measure while others completed a different measure).

Perhaps the most ironic concern involves the lack of control for potential misdiagnosis of ADHD in the ADHD-Dx sample. Some of the individuals included in the genuine ADHD group may have previously feigned the disorder to obtain accommodations and/or medications. While this could be a confounding issue, the clinicians who performed the assessments and assigned the ADHD diagnoses were under supervision both by their peers and a licensed clinical psychologist, which decreases the likelihood of misdiagnosis.

Beyond self-report, MMPI-2-RF, and CPT measures specifically, the current study cannot offer comparisons or conclusions regarding feigned ADHD on other types of measures, namely symptom validity tests (SVTs), which have been highlighted in recent studies as potentially helpful in identifying feigned ADHD (Jasinski et al., 2011).

Utilizing a simulation design may arguably decrease the external validity of the findings, as artificial lab findings do not always translate to real-world application. As previous researchers have noted, there is an appreciable difference between gaining course credit and obtaining stimulant medications. Nonetheless, simulation design is the only way to have full confidence that participants are feigning a specific disorder, a distinct advantage over known-groups design methodology.



## Future Directions

When considering the state of the research on feigned ADHD, it is fair to say it is relatively young and in need of further investigation into detection. However, based on the findings of the current study, a few detailed points deserve additional consideration in the literature and research arenas. First, the Ds-ADHD scale performed well in our sample; however, it requires cross-validation to support its effectiveness as an ADHD feigning measure. Future studies in this area should also consider including a genuine psychopathology group to add support for the use of the Ds-ADHD scale in detecting only feigned ADHD rather than those with genuine mental disorders. Additionally, the Ds-ADHD scale could be tested utilizing an even more sophisticated simulation design like that which was utilized by Harp et al. (2011), including individuals with true diagnoses of ADHD exaggerating their symptoms.

The current study utilized a modest size sample; however, future research in this area should aim to include larger samples, which could allow for more nuanced comparisons and greater generalizability. Another area to explore would be including "near-neighbor" comparisons, such as individuals presenting for a Learning Disability evaluation. It would be interesting to investigate how individuals with LDs or with both LD and ADHD diagnoses would perform on various measures.

It would likely be beneficial to continue to identify which detection strategies most accurately detect feigned ADHD. Specifically, investigating which detection strategies might be most effective in detecting feigned ADHD across

both the cognitive (i.e., inattention) and symptom (i.e., restlessness) domains. Symptom combination detection strategies have shown promise in detecting feigned mental disorders in self-report inventories (Rogers, Robinson, & Gillard, 2014), and may also be useful in detecting feigned ADHD. Similarly, with recent research exploring the use of SVTs in detecting feigned ADHD (Jasinski et al., 2011), examining floor effect or improbable failure strategies may be another avenue of continued research.

### Concluding Thoughts

This study has highlighted the complexities involved in differentiating feigned from genuine ADHD, whilst offering some recommendations for tools that may assist in this process. It is hoped that this study can serve as a stepping-stone to test the effectiveness of development of empirically validated scales to detect feigned ADHD specifically. As this line of research continues to develop, it is important to remember the practical application of the findings, and specifically how this work influences diagnostic accuracy of ADHD, which ultimately benefits patients genuinely seeking these evaluations.

APPENDIX A  
COMMON ADHD MEASURES

- Wender Utah Rating Scale (WURS; Ward, Wender, & Reimherr, 1993),
- ADHD Rating Scale (ADHD-RS; DuPaul, Power, Anastopoulos, & Reid, 1998),
- Connors Adult ADHD Rating Scale Self-Report Long Form (CAARS; Connors, Erhardt, & Sparrow, 1998),
- Adult ADHD Self-Report Scale (ASRS; World Health Organization, 2005),
- ADHD Behavior Checklist (Murphy & Barkley, 1995),
- College ADHD Response Evaluation (CARE: Glutting, Sheslow, & Adams, 2002),
- Attention Deficit Scales for Adults (ADSA; Triolo & Murphy, 1996), and
- Brown Attention Deficit Disorder Scale (BADDs; Brown, 1996).

APPENDIX B

GENDER-SPECIFIC HYPOTHESES REGARDING

INATTENTIVE AND BEHAVIORAL ITEMS

Supplementary Hypothesis 1: Overall, participants in the Non-ADHD, PSYC-Sim, and ADHD-Sim groups are expected to perceive some items from the Activation, Cognitive Complaints, Hypomanic Activation, and the Emotional/Internalizing Dysfunction scales to be related to ADHD, given their related content.

Supplementary Hypothesis 2: Non-ADHD, PSYC-Sim, and ADHD-Sim group females will perceive more inattention and cognitive complaints to be related to ADHD than their male counterparts. Specifically, this will be operationalized as items from the Cognitive Complaint scale (e.g., 31, 280, and 306), which are expected to be endorsed at a higher rate by females than males.

Supplementary Hypothesis 3: Males in the Non-ADHD, PSYC-Sim, and ADHD-Sim groups will perceive more hyperactive and oppositional behaviors to be related to ADHD than will the females in these groups. Specifically, males will endorse items from the Behavioral/Externalizing Dysfunction scale (e.g., 66, 131, 223, and 253) at a higher frequency than their female counterparts.

Items related to Supplemental Hypotheses 1, 2, and 3:

MMPI-2-RF items expected to be endorsed by both genders as being related to ADHD.

3 (reversed): I think I would like the work of a librarian.

4 (reversed): My daily life is full of things that keep me interested.

6: I find it hard to keep my mind on a task or job.

53: At times I am full of energy.

72: At times my thoughts have raced ahead faster than I could speak them.

126 (reversed): I liked school.

136: I cannot keep my mind on one thing.

200: I have more trouble concentrating than others seem to have.

219: Sometimes I become so excited that I find it hard to get to sleep.

234 (reversed): I am not feeling much pressure or stress these days.

267: I have had period when I felt so full of pep that sleep did not seem necessary for days at a time.

MMPI-2-RF items expected to be endorsed as being related to ADHD more frequently by females than males.

31: I cannot understand what I read as well as I used to.

40: Most anytime I would rather sit and daydream than do anything else.

117: There is something wrong with my mind.

181: Once a week or oftener I become very excited.

280: Often I get confused and forget what I want to say.

306: I forget where I leave things.

MMPI-2-FR items expected to be endorsed as being related to ADHD more frequently by males than females.

66: In school I was sometimes sent to the principal for bad behavior.

113 (reversed): I have little or no trouble with my muscles twitching or jumping.

131: When I get bored I like to stir up some excitement.

223: I was suspended from school one or more times for bad behavior.

247 (reverse): I feel tired a good deal of the time.

253: In school my marks in classroom behavior were quite regularly bad.

333: I do not tire quickly.



APPENDIX C

MANIPULATION CHECK GIVEN TO PARTICIPANTS IN EITHER ADHD-SIM  
OR PSYC-SIM GROUPS

### Manipulation Check

1. What were your instructions? (ask follow up as needed)	Correct	Incorrect
2. Did you follow the instructions?	Yes	No
3. On a scale of 1 to 10, how hard would you say you tried to follow the instructions?	1   2   3   4   5   6   7   8   9 10	
4. If this had been real life, do you think you would have been successful at faking? (only for ADHD-Sim and PSYC-Sim Pts)	Yes	No

APPENDIX D  
DEMOGRAPHIC QUESTIONNAIRE

Date:

Are you 18 years or older?      Yes      No

Birthdate (Age):

Year in School:      Freshman      Sophomore      Junior      Senior

Major:

Gender:      Male      Female

Ethnicity:      European American

African American

Mexican American

Hispanic American (Country of Origin = \_\_\_\_\_)

Asian American

Mixed Race/Other \_\_\_\_\_

1<sup>st</sup> Language:      English

Spanish

Other \_\_\_\_\_

Psychological Diagnoses? Yes      No

If yes, which ones:

---

Psychological Medication? Yes      No

If yes, which ones:

---

Severe Brain Injury?      Yes      No

If yes, LOC?      Yes      No

Neurological Problems?    Yes                      No

    If yes, what kind?

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APPENDIX E

ADHD KNOWLEDGE FOLLOW-UP QUESTIONNAIRE

Please read the items below and circle the appropriate answer. For item #3, please write your answer in the blank.

Items	Answer Choices				
1. Have you ever learned about ADHD in a class or in any other training?	Yes	No	Don't Know		
2. Do you know anyone with ADHD?	Yes	No	Don't Know		
3. If yes: What is your relationship?					
4. If yes: Frequency of interaction?	<6X per year	Monthly	Weekly	Daily	
5. Has anyone in your family ever been diagnosed with ADHD?	Yes		No		Don't Know
6. If yes: What is your relationship?	Parent	Sibling	Cousin	Aunt/Uncle	Child
7. Have you ever worked with anyone with ADHD?	Yes		No		Don't Know
8. Before this study, how much would you say you knew about ADHD?	Nothing at all	Very Little	Some things	A Lot	Everything

APPENDIX F

INSTRUCTIONS FOR EACH SCENARIO FOR BOTH GENDERS



Male participants in the PSYC-Sim group received the following instructions:

Your roommate has recently been diagnosed with a mental disorder. You are not sure if it was depression, anxiety, or something else. He had trouble with classes, but then was given some medication from his family doctor, and now does well. He even got a couple of A's recently, and is now able to socialize more. You have some of the same symptoms as your roommate, so during your midterms, you decided to try your roommate's medication, and ended up surprising yourself with how much easier things went. You think that you may have a mental disorder, so you Google mental disorders to learn more about them. On the following pages are some of the things that you find.

When you are done reviewing these materials, please use the colored 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.

Please take the following tests as if you are trying to convince a psychologist that you have a mental disorder. Remember, you're trying to be convincing so that you can get a prescription like your roommate. It is not necessary for you to try to act like you have a mental disorder; you only need to respond to the test items as if you do. In other words, it's about how you *answer* the questions, not how you *act* while taking the tests.

If you are successful at deceiving the tests and following instructions throughout, you have a chance to win a \$50 gift card. But beware, some tests have questions to catch fakers, so you have to be smart about it. If you are too obvious, the psychologist would never believe you and you would get in trouble. Are you clever enough to fake enough to get medication, but not be so blatant that you get caught?

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

[After completion of measures]

Now you'll be given one of the measures you already completed today. This time, you don't have to mark any answers. All you have to do is circle the questions you think are about ADHD. Circle the items you think someone with ADHD would mark "true." Let the researcher know when you are finished.

Female participants in the PSYC-Sim group received the following instructions:

Your roommate has recently been diagnosed with a mental disorder. You are not sure if it was depression, anxiety, or something else. She had trouble with classes, but then was given some medication from her family doctor, and now does well. She even got a couple of A's recently, and is now able to socialize more. You have some of the same symptoms as your roommate, so during your midterms, you decided to try your roommate's medication, and ended up surprising yourself with how much easier things went. You think that you may have a mental disorder, so you Google mental disorders to learn more about them. On the following pages are some of the things that you find.

When you are done reviewing these materials, please use the colored 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.

Please take the following tests as if you are trying to convince a psychologist that you have a mental disorder. Remember, you're trying to be convincing so that you can get a prescription like your roommate. It is not necessary for you to try to act like you have a mental disorder; you only need to respond to the test items as if you do. In other words, it's about how you *answer* the questions, not how you *act* while taking the tests.

If you are successful at deceiving the tests and following instructions throughout, you have a chance to win a \$50 gift card. But beware, some tests have questions to catch fakers, so you have to be smart about it. If you are too obvious, the psychologist would never believe you and you would get in trouble. Are you clever enough to fake enough to get medication, but not be so blatant that you get caught?

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

[After completion of measures]

Now you'll be given one of the measures you already completed today. This time, you don't have to mark any answers. All you have to do is circle the questions you think are about ADHD. Circle the items you think someone with ADHD would mark "true." Let the researcher know when you are finished.

Male participants in the ADHD-Sim group received the following instructions:

Your roommate has been diagnosed with ADHD. He had trouble with classes, but then was given some medication for ADHD from his family doctor, and now does well. He even got a couple of A's recently, and has more time to socialize because studying is not as hard! During your midterms, you decided to try your roommate's medication, and ended up surprising yourself with how much easier things went. You think that you may have undiagnosed ADHD, so you Google the disorder to learn more about it. On the following pages are some of the things that you find.

When you are done reviewing these materials, please use the colored 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.

Please take the following tests as if you are trying to convince a psychologist that you have ADHD. Remember, you're trying to be convincing so that you can get a prescription like your roommate. It is not necessary for you to try to act like you have ADHD; you only need to respond to the test items as if you do. In other words, it's about how you *answer* the questions, not how you *act* while taking the tests.

If you are successful at deceiving the tests and following instructions throughout, you have a chance to win a \$50 gift card! But beware, some tests have questions to catch fakers, so you have to be smart about it. If you are too obvious, the psychologist would never believe you and you would get in trouble. Are you clever enough to fake enough to get medication, but not be so blatant that you get caught?

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

[After completion of measures]

Now you'll be given one of the measures you already completed today. This time, you don't have to mark any answers. All you have to do is circle the questions you think are about ADHD. Circle the items you think someone with ADHD would mark "true." Let the researcher know when you are finished.

Female participants in the ADHD-Sim group received the following instructions:

Your roommate has been diagnosed with ADHD. She had trouble with classes, but then was given some medication for ADHD from her family doctor, and now does well. She even got a couple of A's recently, and has more time to socialize because studying is not as hard! During your midterms, you decided to try your roommate's medication, and ended up surprising yourself with how much easier things went. You think that you may have undiagnosed ADHD, so you Google the disorder to learn more about it. On the following pages are some of the things that you find.

When you are done reviewing these materials, please use the colored 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.

Please take the following tests as if you are trying to convince a psychologist that you have ADHD. Remember, you're trying to be convincing so that you can get a prescription like your roommate. It is not necessary for you to try to act like you have ADHD; you only need to respond to the test items as if you do. In other words, it's about how you *answer* the questions, not how you *act* while taking the tests.

If you are successful at deceiving the tests and following instructions throughout, you have a chance to win a \$50 gift card! But beware, some tests have questions to catch fakers, so you have to be smart about it. If you are too obvious, the psychologist would never believe you and you would get in trouble. Are you clever enough to fake enough to get medication, but not be so blatant that you get caught?

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

[After completion of measures]

Now you'll be given one of the measures you already completed today. This time, you don't have to mark any answers. All you have to do is circle the questions you think are about ADHD. Circle the items you think someone with ADHD would mark "true." Let the researcher know when you are finished.

Male and female participants in the Non-ADHD group received the following honest instructions:

The researcher will ask you to complete several measures today. Four will be paper and pencil format, and two are on a computer. The questions will be about different things, including psychological symptoms, your personality, and how well you pay attention.

Please try your hardest to complete all the measures as accurately as possible. Don't worry about getting the "right" answers, you are only asked to be completely honest and do your best job. Remember to try your best, your answers may help develop a psychological measure that could help clinicians better perform assessments with college students.

[After completion of measures]

Now you'll be given one of the measures you already completed today. This time, you don't have to mark any answers. All you have to do is circle the questions you think are about ADHD. Circle the items you think someone with ADHD would mark "true." Let the researcher know when you are finished.

APPENDIX G

MATERIALS PROVIDED TO PARTICIPANTS

The following materials were provided to participants in the ADHD-Sim group:

### Attention deficit hyperactivity disorder

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From Wikipedia, the free encyclopedia

Attention deficit hyperactivity disorder (ADHD, similar to [hyperkinetic disorder](#) in the [ICD-10](#)) is a [psychiatric disorder](#)<sup>[1][2]</sup> of the [neurodevelopmental](#) type<sup>[3][4]</sup> in which there are significant problems of [attention](#), [hyperactivity](#), or [acting impulsively](#) that are not [appropriate for a person's age](#).<sup>[5]</sup> These symptoms must begin by age six to twelve and be present for more than six months for a diagnosis to be made.<sup>[6][7]</sup> In school-aged individuals inattention symptoms often result in poor school performance.

Despite being the most commonly studied and diagnosed psychiatric disorder in children and adolescents, the cause in the majority of cases is unknown. It affects about 6–7% of children when diagnosed via the [DSM-IV](#) criteria<sup>[8]</sup> and 1–2% when diagnosed via the [ICD-10](#) criteria.<sup>[9]</sup> Rates are similar between countries and depend mostly on how it is diagnosed.<sup>[10]</sup> ADHD is diagnosed approximately three times more in boys than in girls.<sup>[11][12]</sup> About 30–50% of people diagnosed in childhood continue to have symptoms into adulthood<sup>[13]</sup> and between 2–5% of adults have the condition.<sup>[1]</sup> The condition can be difficult to tell apart from other disorders as well as that of high normal activity.<sup>[7]</sup>

### Signs and symptoms

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Inattention, hyperactivity (restlessness in adults), disruptive behavior, and impulsivity are common in ADHD.<sup>[22][23]</sup> Academic difficulties are frequent as are problems with relationships.<sup>[22]</sup> The symptoms can be difficult to define as it is hard to draw a line at where normal levels of inattention, hyperactivity, and impulsivity end and significant levels requiring interventions begin.<sup>[24]:p.26</sup>

To be diagnosed per the fifth edition of the [Diagnostic and Statistical Manual of Mental Disorders](#) (DSM-V), symptoms must be observed in multiple settings for six months or more and to a degree that is greater than others of the same age.<sup>[25]</sup> They must also cause problems in the person's social, academic, or work life.<sup>[25]</sup>

Based on the presenting symptom ADHD can be divided into three subtypes—[predominantly inattentive](#), predominantly hyperactive-impulsive, or combined if criteria for both types are met.<sup>[24]:p.4</sup>

An individual with inattention may have some or all of the following symptoms:<sup>[26]</sup>

- Be easily distracted, miss details, forget things, and frequently switch from one activity to another
- Have difficulty maintaining focus on one task
- Become bored with a task after only a few minutes, unless doing something enjoyable
- Have difficulty focusing attention on organizing and completing a task or learning something new
- Have trouble completing or turning in homework assignments, often losing things (e.g., pencils, toys, assignments) needed to complete tasks or activities
- Not seem to listen when spoken to
- Daydream, become easily confused, and move slowly
- Have difficulty processing information as quickly and accurately as others
- Struggle to follow instructions

An individual with hyperactivity may have some or all of the following symptoms:<sup>[26]</sup>

- Fidget and squirm in their seats
- Talk nonstop
- Dash around, touching or playing with anything and everything in sight
- Have trouble sitting still during dinner, school, doing homework, and story time
- Be constantly in motion
- Have difficulty doing quiet tasks or activities

These hyperactivity symptoms tend to go away with age and turn into "inner restlessness" in teens and adults with ADHD.<sup>[1]</sup>

An individual with impulsivity may have some or all of the following symptoms:<sup>[26]</sup>

- Be very impatient
- Blur out inappropriate comments, show their emotions without restraint, and act without regard for consequences
- Have difficulty waiting for things they want or waiting their turns in games
- Often interrupt conversations or others' activities



People with ADHD more often have difficulties with [social skills](#), such as social interaction and forming and maintaining friendships. About half of children and adolescents with ADHD experience social rejection by their peers compared to 10–15% of non-ADHD children and adolescents. People with ADHD have attention deficits which cause difficulty processing verbal and nonverbal language which can negatively affect social interaction. They also may drift off during conversations, and miss social cues. [\[27\]](#)

The following materials were provided to participants in the PSYC-Sim group:

## Mental disorder

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From Wikipedia, the free encyclopedia

A mental disorder, also called a mental illness or psychiatric disorder, is a [mental](#) or [behavioral](#) pattern or [anomaly](#) that causes either [suffering](#) or an impaired ability to function in ordinary life ([disability](#)), and which is not [developmentally](#) or [socially normative](#). Mental disorders are generally defined by a combination of how a person [feels](#), [acts](#), [thinks](#) or [perceives](#). This may be associated with particular regions or functions of the [brain](#) or rest of the [nervous system](#), often in a [social context](#). Mental disorder is one aspect of [mental health](#). The scientific study of mental disorders is called [psychopathology](#).

## Disorders

See also: [\*List of mental disorders as defined by the DSM and ICD\*](#)

There are many different categories of mental disorder, and many different facets of human behavior and personality that can become disordered.<sup>[8][9][10][11][12]</sup>

[Anxiety](#) or [fear](#) that interferes with normal functioning may be classified as an [anxiety disorder](#).<sup>[13]</sup> Commonly recognized categories include specific [phobias](#), [generalized anxiety disorder](#), [social anxiety disorder](#), [panic disorder](#), [agoraphobia](#), [obsessive-compulsive disorder](#) and [post-traumatic stress disorder](#).

Other affective (emotion/mood) processes can also become disordered. [Mood disorder](#) involving unusually intense and sustained sadness, melancholia, or despair is known as [major depression](#) (also known as unipolar or clinical depression). Milder but still prolonged [depression](#) can be diagnosed as [dysthymia](#). [Bipolar disorder](#) (also known as manic depression) involves abnormally "high" or pressured mood states, known as [mania](#) or [hypomania](#), alternating with normal or depressed mood. The extent to which unipolar and bipolar mood phenomena represent distinct categories of disorder, or mix and merge along a dimension or spectrum of mood, is subject to some scientific debate.<sup>[14]</sup>

Patterns of belief, language use and perception of reality can become disordered (e.g., [delusions](#), [thought disorder](#), [hallucinations](#)). [Psychotic disorders](#) in this domain include [schizophrenia](#), and [delusional disorder](#). [Schizoaffective disorder](#) is a category used for individuals showing aspects of both schizophrenia and affective disorders. [Schizotypy](#) is a category used for individuals showing

some of the characteristics associated with schizophrenia but without meeting cutoff criteria.

[Personality](#)—the fundamental characteristics of a person that influence thoughts and behaviors across situations and time—may be considered disordered if judged to be abnormally rigid and [maladaptive](#). Although treated separately by some, the commonly used categorical schemes include them as mental disorders, albeit on a separate "[axis II](#)" in the case of the DSM-IV. A number of different [personality disorders](#) are listed, including those sometimes classed as "eccentric", such as [paranoid](#), [schizoid](#) and [schizotypal](#) personality disorders; types that have described as "dramatic" or "emotional", such as [antisocial](#), [borderline](#), [histrionic](#) or [narcissistic](#) personality disorders; and those sometimes classed as fear-related, such as [anxious-avoidant](#), [dependent](#), or [obsessive-compulsive](#) personality disorders. The personality disorders in general are defined as emerging in childhood, or at least by adolescence or early adulthood. The ICD also has a category for enduring personality change after a catastrophic experience or psychiatric illness. If an inability to sufficiently adjust to life circumstances begins within three months of a particular event or situation, and ends within six months after the stressor stops or is eliminated, it may instead be classed as an [adjustment disorder](#). There is an emerging consensus that so-called "personality disorders", like personality traits in general, actually incorporate a mixture of acute dysfunctional behaviors that may resolve in short periods, and maladaptive temperamental traits that are more enduring.<sup>[15]</sup> Furthermore, there are also non-categorical schemes that rate all individuals via a profile of different dimensions of personality without a symptom-based cutoff from normal personality variation, for example through schemes based on dimensional models.<sup>[16]</sup>

[Eating disorders](#) involve disproportionate concern in matters of food and weight.<sup>[13]</sup> Categories of disorder in this area include [anorexia nervosa](#), [bulimia nervosa](#), [exercise bulimia](#) or [binge eating disorder](#).

[Sleep disorders](#) such as [insomnia](#) involve disruption to normal [sleep](#) patterns, or a feeling of tiredness despite sleep appearing normal.

[Sexual](#) and gender identity disorders may be diagnosed, including [dyspareunia](#), [gender identity disorder](#) and [ego-dystonic homosexuality](#). Various kinds of [paraphilia](#) are considered mental disorders (sexual arousal to objects, situations, or individuals that are considered abnormal or harmful to the person or others).

People who are abnormally unable to resist certain urges or impulses that could be harmful to themselves or others, may be classed as having an impulse control disorder, and disorders such as [kleptomania](#) (stealing) or [pyromania](#) (fire-setting). Various behavioral addictions, such as [gambling](#) addiction, may be classed as a disorder. Obsessive-compulsive disorder can sometimes involve an inability to resist certain acts but is classed separately as being primarily an anxiety disorder.

The use of drugs (legal or illegal, including [alcohol](#)), when it persists despite significant problems related to its use, may be defined as a mental disorder. The DSM incorporates such conditions under the umbrella category of [substance use disorders](#), which includes [substance dependence](#) and [substance abuse](#). The DSM does not currently use the common term drug addiction, and the ICD simply refers to "harmful use". Disordered substance use may be due to a pattern of compulsive and repetitive use of the drug that results in tolerance to its effects and withdrawal symptoms when use is reduced or stopped.

People who suffer severe disturbances of their self-identity, memory and general awareness of themselves and their surroundings may be classed as having [dissociative identity disorder](#), such as [depersonalization disorder](#) or Dissociative Identity Disorder itself (which has also been called multiple personality disorder, or "split personality"). Other memory or [cognitive disorders](#) include [amnesia](#) or various kinds of old age [dementia](#).

A range of [developmental disorders](#) that initially occur in childhood may be diagnosed, for example [autism spectrum](#) disorders, [oppositional defiant disorder](#) and [conduct disorder](#), and [attention deficit hyperactivity disorder](#) (ADHD), which may continue into adulthood.

Conduct disorder, if continuing into adulthood, may be diagnosed as [antisocial personality disorder](#) (dissocial personality disorder in the ICD). Popularist labels such as [psychopath](#) (or sociopath) do not appear in the DSM or ICD but are linked by some to these diagnoses.

Somatoform disorders may be diagnosed when there are problems that appear to originate in the body that are thought to be manifestations of a mental disorder. This includes [somatization disorder](#) and [conversion disorder](#). There are also disorders of how a person perceives their body, such as [body dysmorphic disorder](#). [Neurasthenia](#) is an old diagnosis involving somatic complaints as well as fatigue and low spirits/depression, which is officially recognized by the ICD-10 but no longer by the DSM-IV.<sup>[17]</sup>

[Factitious disorders](#), such as [Munchausen syndrome](#), are diagnosed where symptoms are thought to be experienced (deliberately produced) and/or reported (feigned) for personal gain.

APPENDIX H  
FAKING STRATEGIES

ADHD Faking Strategies:

Please write down any strategy you used to fake ADHD today. When you are done, flip this page over and answer the questions about your strategy or strategies.

Please read the questions below and circle either “Yes” or “No” to indicate which strategies you used to fake ADHD.

On <i>any</i> of the tasks where you were asked to fake, did you...		
respond slowly?	Yes	No
respond inconsistently?	Yes	No
try to appear less intelligent?	Yes	No
try to miss easy items?	Yes	No
try to miss difficult items?	Yes	No
try to show difficulty with paying attention?	Yes	No
alter your strategy during the session?	Yes	No
have difficulty maintaining your strategy during the session?	Yes	No

On the computer task where you were asked to fake, did you...		
try to ignore the visual stimuli?	Yes	No
try to ignore the auditory stimuli?	Yes	No
try to click the button when you weren't supposed to?	Yes	No
try <i>not</i> to click the button when you were supposed to?	Yes	No
ever double-click the mouse to show hyperactivity?	Yes	No
try to respond the slowest at the end of the task?	Yes	No



Mental Disorder Faking Strategies:

Please write down any strategy you used to fake having a mental disorder today. When you are done, flip this page over and answer the questions about your strategy or strategies.

Please read the questions below and circle either “Yes” or “No” to indicate which strategies you used to fake having a mental disorder.

On <i>any</i> of the tasks where you were asked to fake, did you...		
think of someone you know with a mental disorder and try to answer like them?	Yes	No
respond inconsistently?	Yes	No
try to appear less intelligent?	Yes	No
try to miss easy items?	Yes	No
try to miss difficult items?	Yes	No
alter your strategy during the session?	Yes	No
have difficulty maintaining your strategy during the session?	Yes	No
pretend to have a specific mental disorder?	Yes	No

If you answered “Yes” to the last question, which mental disorder were you trying to fake?

\_\_\_\_\_

On the computer task where you were asked to fake, did you...		
try to ignore the visual stimuli?	Yes	No
try to ignore the auditory stimuli?	Yes	No
try to click the button when you weren’t supposed to?	Yes	No
try <i>not</i> to click the button when you were supposed to?	Yes	No
ever double-click the mouse to show hyperactivity?	Yes	No
try to respond the slowest at the end of the task?	Yes	No

## APPENDIX I

### MANOVA RESULTS BETWEEN GROUPS ACROSS MMPI-2-RF SCALES

	Simulation Groups				Genuine Groups				<i>F</i>	<i>p</i>
	ADHD-Sim		PSYC-Sim		Non-ADHD		ADHD-Dx			
	<i>n</i> = 31		<i>n</i> = 35		<i>n</i> = 30		<i>n</i> = 51			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
RF H-O									12.76	<.001
EID	60.81	11.38	74.86	16.01	54.00	12.08	54.64	11.30		
THD	54.42	20.09	59.34	27.88	54.50	12.64	50.53	7.72		
BXD	71.00	10.62	58.69	15.10	49.87	8.59	53.47	9.02		
RF RC									6.04	<.001
RCd	64.68	8.78	74.51	12.96	56.67	10.91	59.72	10.59		
RC1	63.36	12.72	67.06	22.45	56.80	14.40	58.22	10.65		
RC2	59.42	15.33	77.11	19.14	48.70	13.17	53.89	11.93		
RC3	62.39	13.38	64.17	11.88	55.53	11.66	52.06	9.68		
RC4	70.61	10.97	61.97	13.59	49.20	8.41	55.83	9.98		
RC6	53.58	21.12	61.57	26.97	55.13	11.11	52.92	10.29		
RC7	58.58	11.63	69.00	16.11	55.00	9.97	51.58	8.62		
RC8	64.52	14.39	66.89	20.41	56.87	13.12	53.28	7.98		
RC9	67.52	12.54	53.77	15.89	51.70	8.44	50.39	6.63		
RF I and E									4.81	<.001
SUI	50.97	13.91	47.69	30.34	47.70	12.39	48.61	9.87		
HLP	58.03	13.68	74.23	14.60	52.63	11.68	48.53	11.52		
SFD	56.58	11.75	68.26	12.25	55.37	12.91	56.22	15.16		
NFC	63.29	9.22	67.80	12.53	57.97	12.28	57.42	10.73		
STW	58.48	8.96	66.91	12.36	56.10	11.41	54.31	11.04		
AXY	57.06	18.68	77.71	16.02	57.93	11.95	55.31	15.00		
ANP	66.68	11.92	62.31	13.11	53.17	9.71	51.17	9.10		
BRF	59.32	19.29	68.03	18.51	52.20	12.68	51.83	9.03		
MSF	45.87	7.00	52.17	12.16	50.20	8.79	46.14	7.78		
Som/Cog									5.48	<.001
MLS	59.10	11.20	69.54	14.35	55.07	12.51	56.89	9.15		
GIC	55.29	13.26	68.69	17.97	52.67	12.08	53.94	12.59		
HPC	55.10	13.18	64.94	14.98	53.20	12.21	55.31	11.36		
NUC	69.65	14.69	72.66	15.97	58.03	14.66	58.25	10.29		
COG	80.39	8.77	75.86	13.10	59.83	11.98	69.03	9.69		
FML	63.65	10.16	64.43	14.65	54.40	10.39	52.19	11.31		
IPP	46.87	11.15	59.80	16.84	43.40	6.26	48.86	11.79		
SAV	51.58	15.36	67.54	15.66	49.43	11.74	48.92	10.22		
SHY	50.35	10.53	62.34	12.49	52.23	10.99	49.22	9.75		
DSF	67.68	19.62	79.83	18.47	53.33	14.07	51.78	10.17		
AES	43.58	8.18	46.69	8.89	48.07	7.24	44.11	7.23		
MEC	54.87	10.32	47.86	9.48	46.23	8.13	49.64	10.19		

		Simulation Groups				Genuine Groups					
		ADHD-Sim		PSYC-Sim		Non-ADHD		ADHD-Dx		<i>F</i>	<i>p</i>
		<i>n</i> = 31		<i>n</i> = 35		<i>n</i> = 30		<i>n</i> = 51		9.00	<.001
Revised											
PSY5											
	AGGR-r	59.06	13.62	48.80	16.24	53.97	9.36	47.83	7.74		
	PSYC-r	52.26	20.32	59.09	27.44	53.93	12.82	51.97	8.23		
	DISC-r	68.55	10.78	56.06	13.89	49.13	8.91	54.31	9.46		
	NEGE-r	59.84	10.85	70.37	14.76	55.73	10.64	53.25	11.11		
	INTR-r	50.65	12.78	70.43	19.03	48.53	10.71	50.22	11.03		

*Note.* RF H-O = Higher Order; EID = Emotional/Internalizing Dysfunction; THD = Thought Dysfunction; BXD = Behavioral/Externalizing Dysfunction; RCd = Demoralization; RC1= Somatic Complaints; RC2=Low Positive Emotions; RC3=Cynicism; RC4=Antisocial Behavior; RC6=Ideas of Persecution; RC7=Dysfunctional Negative Emotions; RC8=Aberrant Experiences; RC9=Hypomanic Activation; MLS=Malaise; GIC=Gastrointestinal Complaints; HPC=Head Pain Complaints; NUC=Neurological Complaints; COG=Cognitive Complaints; SUI=Suicidal/Death Ideation; HLP=Helplessness/Hopelessness; SFD=Self-Doubt; NFC=Inefficacy; STW=Stress/Worry; AXY=Anxiety; ANP=Anger Proneness; BRF=Behavior-Restricting Fears; MSF=Multiple Specific Fears; JCP=Juvenile Conduct Problems; SUB=Substance Abuse; AGG=Aggression; ACT=Activation; FML=Family Problems; IPP=Interpersonal Passivity; SAV=Social Avoidance; SHY=Shyness; DSF=Disaffiliativeness; AES=Aesthetic-Literary Interests; MEC=Mechanical-Physical Interests; AGGR-r=Aggressiveness-Revised; PSYC-r=Psychoticism-Revised; DISC-r=Disconstraint-Revised; NEGE-r=Negative Emotionality/Neuroticism-Revised; INTR-r=Introversion/Low Emotionality-Revised.

APPENDIX J

DESCRIPTIVE DATA OF PARTICIPANTS EXCEEDING PDSQ CUT SCORES

ACROSS GROUPS

PDSQ Cut Score	Simulation Groups				Genuine Groups			
	ADHD-Sim		PSYC-Sim		Non-ADHD		ADHD-Dx	
	(n = 32)		(n = 35)		(n = 30)		(n = 48) <sup>a</sup>	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
MDD ≥ 9	13	3.13	24	68.57	5	16.67	10	20.83
Bulimia ≥ 7	3	9.38	0	0.00	2	6.67	2	4.17
OCD ≥ 1	16	50.00	20	57.14	9	30.00	20	41.67
PTSD ≥ 5	12	37.50	16	45.71	6	20.00	9	18.75
Panic ≥ 4	13	3.13	19	54.29	6	20.00	8	16.67
Agoraphobia ≥ 4	13	3.13	22	62.86	7	23.33	8	16.67
Social Phobia ≥ 4	26	81.25	29	82.86	17	56.67	26	54.17
Alcohol ≥ 1	8	25.00	15	42.86	5	16.67	11	22.92
Drug ≥ 1	2	6.25	8	22.86	0	0.00	7	14.58
GAD ≥ 7	8	25.00	21	60.00	2	6.67	17	35.42
Somatoform Disorder ≥ 2	10	31.25	15	42.86	9	30.00	9	18.75
Hypochondriasis ≥ 1	8	25.00	11	31.43	4	13.33	9	18.75
Psychosis ≥ 1	11	34.38	19	54.29	2	6.67	4	8.33
	<i>M</i>		<i>M</i>		<i>M</i>		<i>M</i>	
Total Averages	25.72		48.13		18.98		22.44	

*Note.* MDD = Major Depressive Disorder; OCD = Obsessive Compulsive Disorder; PTSD = Posttraumatic Stress Disorder; Alcohol = Alcohol Use or Dependence; Drug = Drug Use or Dependence; GAD = Generalized Anxiety Disorder.

<sup>a</sup> Three archival files did not contain PDSQ data.

APPENDIX K

DETECTION STRATEGIES BASED ON ROGERS (2008)



#### Unlikely presentations:

- Rare symptoms: Symptoms that are reported infrequently or less than 5.0% in genuine clinical populations.
- Quasi-rare symptoms: Symptoms that are not commonly observed in normative samples – may be due to a genuine or a malingered disorder.
- Symptom combination: Common symptoms in genuine clinical populations that do not commonly co-occur.
- Improbable symptoms: Similar to rare symptoms, improbable symptoms are those that are uncommon in genuine clinical populations, but that also have an outrageous or absurd quality.
- Spurious patterns of psychopathology: Patterns of responses observed on various scales that are uncharacteristic for those with genuine clinical conditions.

#### Amplified presentations:

- Indiscriminant symptom endorsement: When an individual endorses a large proportion of symptoms.
- Symptom severity: When a wide range of symptoms are reported to be of “unbearable” intensity.
- Obvious symptoms: The reporting of obvious and prominent symptoms that are known to be clearly suggestive of genuine severe mental illnesses.
- Reported versus observed symptoms: When symptom reports are incongruent with clinical observations.

Erroneous stereotypes: Item endorsement of erroneous symptoms misperceived to be related to mental illness.

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