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PSYCHIATRY AND PRECLINICAL PSYCHIATRIC STUDIES - REVIEW ARTICLE

# Detection of feigned attention deficit hyperactivity disorder

**Lara Tucha · Anselm B. M. Fuermaier · Janneke Koerts · Yvonne Groen · Johannes Thome**

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**Abstract** In recent years, there is an increasing awareness that individuals may purposely feign or exaggerate symptoms of attention deficit hyperactivity disorder (ADHD) to gain external incentives, including access to stimulant drugs or special academic accommodations. There are vast consequences of undetected feigned ADHD such as substantial costs covered by society for unnecessary assessments and treatments, unjustified occupation of limited medical resources and undermining society's trust in the existence of the disorder or the effectiveness of treatment. In times of economic crisis and cost savings in the medical sector, the detection of feigned ADHD is of importance. This review briefly describes the research on this topic with an emphasis on the approaches available for detection of feigned ADHD (i.e., self-report questionnaires, personality inventories, cognitive tests used in routine neuropsychological assessment and tests specifically designed for detecting feigned cognitive dysfunction). Promising approaches and measures are available for identifying feigned ADHD but there is an immediate need for further research.

**Keywords** Adult ADHD · Malingering · Effort · Feigning · Symptom validity

L. Tucha (✉) · A. B. M. Fuermaier · J. Koerts · Y. Groen
Department of Clinical and Developmental Neuropsychology, University of Groningen, Grote Kruisstraat 2/1, 9712 TS Groningen, The Netherlands
e-mail: L.I.Tucha@rug.nl

J. Thome
Department of Psychiatry and Psychotherapy, University of Rostock, Rostock, Germany

## Introduction

In the past 10 years, it became widely accepted that attention deficit hyperactivity disorder (ADHD) is a condition that does not disappear with maturation in adolescence but persists in a considerable number of individuals from childhood into adulthood (Wasserstein 2005; Lange et al. 2010). For example, Barkley and colleagues (2002) reported a persistence of ADHD into adulthood in 66 % of a clinic-referred sample. A recent epidemiologic study indicated a persistence of ADHD in about 29–38 % of a population-based sample (Barbaresi et al. 2013).

The increased awareness of ADHD being a condition also affecting adults triggered studies which looked into the effects of pharmacological treatment approaches on the adult ADHD symptomatology and revealed that stimulant drug treatment improves various symptoms and aspects of functioning (Wasserstein et al. 2001; Tucha et al. 2006, 2008). With the acceptance and proof of effectiveness of stimulant drug treatment regimens, a new problem arose which was not anticipated and to which there is no clear solution yet. This problem refers to the possibility that healthy individuals may deliberately feign or exaggerate symptoms of ADHD to get access to stimulant medication for academic or recreational reasons (Levin 2007; Green and Rabiner 2012; Lensing et al. 2013; Rabiner 2013). Common motives for nonmedical use of stimulants comprise cognitive enhancement (e.g., increasing attention), improving academic performance, alleviating psychological distress, improving athletic performance, losing weight or getting high (Rabiner et al. 2009; Sansone and Sansone 2011; Rabiner 2013). However, in this context, it has to be emphasized that methylphenidate usage is related with potential risks for healthy individuals. It appears likely that already low doses result in excessive levels of dopamine

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and norepinephrine in the brain of healthy individuals affecting plasticity and functioning of the prefrontal cortex adversely (e.g., cognitive flexibility). Since previous research indicated age-dependent differences in the action of methylphenidate, younger individuals and in particular juveniles and adolescents are most susceptible for these effects since their prefrontal cortex is not fully developed yet. For a review of the neurobiological effects of low doses of methylphenidate on the healthy brain, please view Urban and Gao (2014). It also has to be pointed out that there are additional ways to access stimulant medication other than feigning/exaggerating ADHD, including getting or stealing it from family members or friends who have been prescribed stimulants (Novak et al. 2007) or by illegal procurement on the black market (Goodman 2010; Franke et al. 2011). Besides getting access to stimulant drugs, there are also other incentives discussed with regard to feigning ADHD (Alfano and Brauer Boone 2007; Tucha et al. 2009; Sansone and Sansone 2011; Pella et al. 2012) including diminished criminal responsibility or evasion of criminal prosecution (forensic context), access to social welfare benefits because of unemployability (professional context) as well as special academic accommodations or award of extra time for assignments and exams (academic context). For example, there is indeed evidence that the number of students self-referring for ADHD evaluations at the post-secondary level increased markedly (Harrison et al. 2008; Pella et al. 2012) with 25–50 % of those students exaggerating symptoms (Sullivan et al. 2007). Furthermore, there is considerable evidence for nonmedical use of stimulant drugs (Babcock and Byrne 2000; Moline and Frankenberger 2001; Barrett et al. 2005; McCabe et al. 2005, 2006; White et al. 2006; Advokat et al. 2008; Judson and Langdon 2009). This is on the one hand supported by findings showing that individuals divert, i.e., share, sell or trade their prescribed medications. A recent study by Garnier and colleagues (2010), for instance, revealed that about 36 % of college students who took prescribed medications diverted their medication at least once in their lifetime, with two-thirds of these students diverting ADHD medication. On the other hand, evidence is provided by prevalence rates of nonmedical use of stimulants. As pointed out by Sansone and Sansone (2011), there is some variability in the prevalence rates reported between studies with 13–34 % of college students admitting illicit use of stimulants (Hall et al. 2005; DeSantis et al. 2008) and around 8 % of college students reporting nonmedical use during the last month (Weyandt et al. 2009) and around 5 % during the last year (McCabe et al. 2006). Despite this variability, these figures indicate that concerns about nonmedical use of stimulant drugs are warranted (Rabiner 2013).

## Consequences and frequency of feigned ADHD

Consequences of undetected feigned ADHD and likely subsequent unjustifiable prescription and nonmedical use of stimulants are manifold and comprise among others (1) substantial costs for society (i.e., costs for assessments and treatments), (2) unjustified occupation of limited medical resources (e.g., health specialists' time or occupation of treatment places, e.g., psychotherapy), (3) damage of public's confidence in effectiveness of therapies and therapists, (4) fuelling and biasing the controversial discussion about the existence of ADHD and its pharmacological treatment, (5) disadvantage for those individuals (e.g., university students) who do not feign ADHD (e.g., no special accommodations like free laptops, special bursaries or extra time for assignments) as well as (6) passive support of potential drug-trafficking and drug abuse. The latter point refers to the society's responsibility in preventing malingering (which is the technical term used to describe 'feigning' in this context) in favor of the feigning individuals themselves. This is supported by a recent upsetting case report about a 24-year-old college graduate and his career in feigning ADHD for years to obtain stimulant medication as well as his tragic dead (Schwarz 2013). ADHD is a condition which might be susceptible to malingering because of a complex etiology (Millichap 2008; Thome et al. 2012; Wankerl et al. 2014), a lack of distinct and decisive symptoms, vague diagnostic criteria and the importance of patients' reports for diagnosing ADHD (Fuermaier et al. 2012; Mueller et al. 2012). Accordingly, significantly increased rates of suspected feigning and symptom exaggeration were reported in the context of ADHD with rates up to around 48 % of those individuals presenting for an ADHD evaluation (Sullivan et al. 2007). In contrast, base rates in general clinical patient populations other than ADHD are assumed to be around 15 % (outside the forensic context, Rogers et al. 1993).

## Research designs and approaches applied for studying feigned ADHD

Considering the vast consequences, it is surprising that only a very limited number of studies evaluated potential approaches to detect feigned ADHD. A thorough literature search of major databases revealed 20 studies giving attention to this topic. The value of some of these studies is limited because they are case reports (e.g., Conti 2004) or retrospective studies using archival data (Sullivan et al. 2007; Suhr et al. 2008; Harrison and Edwards 2010; Harrison et al. 2010; Marshall et al. 2010; Suhr et al. 2011a).

The problem associated with retrospective studies is that these studies separate retrospectively their sample into (at least) two groups of participants (a credible group and a noncredible group) on the basis of diagnostic criteria for feigned cognitive dysfunction (i.e., Slick criteria; Slick et al. 1999) or the participants' performance on tests measuring test effort. Fulfilling these criteria or showing suboptimal performance on effort tests is, however, not necessarily an indicator that noncredible participants really malingered ADHD (Suhr et al. 2008). Only a part of the available studies applied so-called "simulation designs" which represent the current gold standard for the controlled experimental evaluation of test approaches for the detection of malingering. In a simulation design, healthy participants are randomly allocated to different conditions and asked to respond to rating scales and tests in a particular manner. While participants of the control condition are asked to perform tests and scales to the best of their knowledge (answering questions honestly and with accuracy, giving effort to tests), participants of the experimental

**Table 1** Studies performing self-report ADHD questionnaires

| References | Study design | Measure(s) | Result |
|---|---|---|---|
| Quinn (2003) | SD | - ADHD Behaviour Checklist (Murphy and Barkley 1996) | Scores in believable range[a] |
| Jachimowicz and Geiselman (2004) | SD | - ARS (DuPaul et al. 1998) | Scores in believable range[a] |
| | | - BAAS (Brown 1996) | Scores in believable range[a] |
| | | - CAARS (Conners et al. 1998) | Scores in believable range[a] |
| | | - WURS (Ward et al. 1993) | Scores in believable range[a] |
| Harrison et al. (2007) | SD | - CAARS (Conners et al. 1998) | Scores in believable range[a] |
| Fisher and Watkins (2008) | SD | - ADHD Behavior Checklist (Murphy and Barkley 1995) | Scores in believable range[a] |
| | | - College ADHD Response Evaluation (CARE; Glutting et al. 2002) | Scores in believable range[a] |
| Suhr et al. (2008) | RD | - CAARS (Conners et al. 1998) | Scores in believable range[b] |
| | | - WURS (Ward et al. 1993) | Scores in believable range[b] |
| Tucha et al. (2009) | SD | - BAAS (Brown 1996) | Scores in believable range[a] |
| Booksh et al. (2010) | SD | - Attention Deficit Scales for Adults (ADSA; Triolo and Murphy 1996) | Scores in believable range[a] |
| | | - WURS (Ward et al. 1993) | Scores in believable range[a] |
| Harrison and Edwards (2010) | RD | - CAARS (Conners et al. 1998) | Scores in believable range[b] |
| Marshall et al. (2010) | RD | - Barkley Adult ADHD Self-Report Subscales (BAASRF; Barkley and Murphy 2005) | Scores in believable range[b] |
| | | - Clinical Assessment of Attention Deficit-Adult (CAT-A) Infrequency Scale (Bracken and Boatwright 2005) | Scores in believable range[b] |
| Sollman et al. (2010) | SD | - ARS (Barkley and Murphy 2005) | Scores in believable range[a] |
| | | - CAARS (Conners et al. 1999) | Scores in believable range[a] |
| Harp et al. (2011) | SD | - CAARS (Conners et al. 1999) | Scores in believable range[a] |
| Jasinski et al. (2011) | SD | - CAARS (Conners et al. 1999) | Scores in believable range[a] |
| Suhr et al. (2011b) | RD | - New Infrequency Index for the CAARS (CII; Conners et al. 1998) | Appears promising in detecting feigned ADHD (however future research needed for further validation) |
| Young and Gross (2011) | SD | - ARS (Barkley and Murphy 2005) | Scores in believable range[a] |
| Rios and Morey (2013) | SD | - CAARS (Conners et al. 1999) | Scores in believable range[a]; no consideration of patient data |

*SD* simulation study design, *RD* retrospective study design/archival (clinical) data, *ARS* ADHD Rating Scale, *BAAS* Brown Adult ADHD Scale, *CAARS* Conners' Adult ADHD Rating Scale, *WURS* Wender Utah Rating Scale

[a] Instructed simulators were successful in feigning symptoms of ADHD

[b] Noncredible individuals could not been reliably distinguished from ADHD patients who gave credible effort

conditions are instructed to feign a particular symptom or disease in these tests and scales. Several experimental conditions can be included in the design by varying the amount of participants' knowledge about the symptom or syndrome to be feigned (symptom coaching) or the tests applied for assessment (test coaching) (Rogers 2008). The responses of the instructed coached simulators are usually compared to the responses of instructed simulators without coaching (naïve simulators), control participants and genuine patients (Rogers 2008). The rationale behind the variation of knowledge is that it is of great interest to find out to what amount test measures are robust against malingering: One would expect, that the more individuals know about a particular test and symptom the easier it is for them to feign the symptom in this test. If instructed simulators are, however, not able to feign a symptom despite being coached, the symptom and/or test are robust against malingering. With regard to ADHD, studies primarily focused on instructed naïve simulators and simulators receiving symptom coaching. Test coaching has till now unfortunately been widely neglected. Another constraint is that studies failed to include a clinical patient group (Leark et al. 2002; Rios and Morey 2013) which reduces the clinical application of results considerably. Furthermore, as already pointed out by Musso and Gouvier (2014), small sample sizes represent a limitation.

## Measures for detecting feigned ADHD

The usefulness of various measures in detecting feigned ADHD has been examined. The presentation of available studies in this review (Leark et al. 2002; Quinn 2003; Jachimowicz and Geiselman 2004; Harrison et al. 2007; Sullivan et al. 2007; Fisher and Watkins 2008; Frazier et al. 2008; Suhr et al. 2008; Tucha et al. 2009; Booksh et al. 2010; Harrison and Edwards 2010; Harrison et al. 2010; Marshall et al. 2010; Sollman et al. 2010; Harp et al. 2011; Jasinski et al. 2011; Suhr et al. 2011a, b; Young and Gross 2011; Rios and Morey 2013) will follow a classification of studies as suggested by Musso and Gouvier (2014) who differentiated between studies using self-report ADHD questionnaires, personality inventories, cognitive tests used in routine neuropsychological assessment and tests that were specifically designed for detecting feigned cognitive dysfunction. However, it has to be emphasized that the latter tests were not specifically designed for detecting feigned ADHD but rather for identifying feigned cognitive dysfunctioning following acquired brain lesions (in particular traumatic brain injury).

The results of studies indicate that self-reported symptoms of ADHD can easily be feigned on ADHD self-report questionnaires (Table 1). Those instructed to feign ADHD needed only short periods of preparation to be able to simulate both current symptoms and childhood symptoms of ADHD in these measures. This is alarming since self-reports are the most relevant and sometimes only available source of information used to make a diagnosis of ADHD. On the basis of self-report questionnaires, clinicians therefore can neither question the genuineness of ADHD symptoms nor determine whether an individual feigns or exaggerates ADHD symptoms (Musso and Gouvier 2014). A recently developed index for the Conners' Adult Attention Deficit/Hyperactivity Rating Scale (CAARS; Conners et al. 1999) might be a promising exception, since it shows reasonable sensitivity in detecting simulated ADHD (Suhr et al. 2011b). However, the sensitivity of this index has neither been replicated nor validated, so that further validation studies, in particular on larger samples, are imperative prior to application.

The small number of studies looking into the usefulness of validity indices of personality inventories provided mixed results (Table 2). For example, while Young and Gross (2011) observed that several indices and scales of the second edition of the Minnesota Multiphasic Personality Inventory (MMPI-2; Butcher et al. 1989) are useful in

**Table 2** Studies performing validity indices of personality inventories

| References | Study design | Measure(s) | Result |
|---|---|---|---|
| Sullivan et al. (2007) | RD | - Personality Assessment Inventory (PAI; Morey 1991) | Scores in believable range [a] |
| Harp et al. (2011) | SD | - Minnesota Multiphasic Personality Inventory, Restructured Form (MMPI-2-RF; Ben-Porath and Tellegen 2008) | Moderate potential in detecting feigned ADHD (however future research needed for further validation) |
| Young and Gross (2011) | SD | - Minnesota Multiphasic Personality Inventory (MMPI-2; Butcher et al. 1989) | Appears promising in detecting feigned ADHD (however future research needed for further validation) |
| Rios and Morey (2013) | SD | - Personality Assessment Inventory-Adolescent (PAI-A; Morey 2007) | Appears promising in detecting feigned ADHD (however future research needed for further validation) |

*SD* simulation study design, *RD* retrospective study design/archival (clinical) data

[a] Noncredible individuals could not been reliably distinguished from ADHD patients who gave credible effort

**Table 3** Studies performing test measures used in routine neuropsychological assessment

| References | Study design | Measure(s) | Result |
|---|---|---|---|
| Leark et al. (2002) | SD | - Test of Variables of Attention (TOVA; Greenberg et al. 1996) | No conclusion can be drawn because no patient group has been included |
| Quinn (2003) | SD | - Integrated Visual and Auditory Continuous Performance Test (IVA CPT; Sandford and Turner, 1995) | ADHD simulators performed poorer than genuine ADHD patients |
| Harrison et al. (2007) | SD | - Decision Speed (WJPB; Woodcock et al. 2001) | ADHD simulators performed poorer than genuine ADHD patients |
| | | - Reading Fluency (WJPB; Woodcock et al. 2001) | ADHD simulators performed poorer than genuine ADHD patients |
| | | - Visual Matching (WJPB; Woodcock et al. 2001) | ADHD simulators performed poorer than genuine ADHD patients |
| | | | However, low diagnostic accuracy of WJPB-subtests (discriminant function analyses) |
| Sullivan et al. (2007) | RD | - CVLT-2 (Delis et al. 2000) | Test performance associated with measures of effort |
| | | - IQ (WAIS-III; Wechsler 1997a) | Test performance associated with measures of effort |
| Frazier et al. (2008) | SD | - Digit Symbol Test (WAIS-III; Wechsler 1997a) | No conclusion can be drawn because no patient group has been included |
| | | - Reading Test (Wide Range Achievement Test, WRAT-3; Wilkinson 1993) | |
| Suhr et al. (2008) | RD | - Auditory Verbal Learning Test (AVLT; Lezak et al. 2004) | Noncredible ADHD group performed poorer than credible ADHD group |
| | | - Controlled Oral Word Association Test (Benton et al. 1983) | Scores in believable range[b] |
| | | - Processing Speed Index (WAIS-III; Wechsler 1997a) | Scores in believable range[b] |
| | | - Stroop Color-Word Test (Golden 1978) | Noncredible ADHD group performed poorer than credible ADHD group |
| | | - Trail Making Test Part A (Reitan 1958) | Scores in believable range[b] |
| | | - Trail Making Test Part B (Reitan 1958) | Noncredible ADHD group performed poorer than credible ADHD group |
| | | - Working Memory Index (WAIS-III; Wechsler 1997a) | Noncredible ADHD group performed poorer than credible ADHD group |
| Booksh et al. (2010) | SD | - Conners' Continuous Performance Test (C-CPT; Conners 1995) | ADHD simulators performed poorer than genuine ADHD patients |
| | | - Digit Span (WAIS-III; Wechsler 1997a) | Scores in believable range[a] |
| | | - Letter-Number Sequencing (WAIS-III; Wechsler 1997a) | Scores in believable range[a] |
| | | - Symbol Coding (WAIS-III; Wechsler 1997a) | Scores in believable range[a] |
| | | - Symbol Search (WAIS-III; Wechsler 1997a) | Scores in believable range[a] |
| | | - Trail Making Test Part A (Reitan 1958) | ADHD simulators performed poorer than genuine ADHD patients |
| | | - Trail Making Test Part B (Reitan 1958) | Scores in believable range[a] |

**Table 3** continued

| References | Study design | Measure(s) | Result |
|---|---|---|---|
| Harrison and Edwards (2010) | RD | - Full Scale IQ (WAIS-III; Wechsler 1997a) | Noncredible ADHD group performed poorer than credible ADHD group (however, scores still in believable range) |
| | | - Performance IQ (WAIS-III; Wechsler 1997a) | Noncredible ADHD group performed poorer than credible ADHD group (however, scores still in believable range) |
| | | - Verbal IQ (WAIS-III; Wechsler 1997a) | Noncredible ADHD group performed poorer than credible ADHD group (however, scores still in believable range) |
| | | - Perceptual Organization (WAIS-III; Wechsler 1997a) | Noncredible ADHD group performed poorer than credible ADHD group (however, scores still in believable range) |
| | | - Processing Speed (WAIS-III; Wechsler 1997a) | Scores in believable range[b] |
| | | - Verbal Comprehension (WAIS-III; Wechsler 1997a) | Noncredible ADHD group performed poorer than credible ADHD group (however, scores still in believable range) |
| | | - Working Memory (WAIS-III; Wechsler 1997a) | Scores in believable range[b] |
| | | - Decision Speed (WJPB; Woodcock et al. 2001) | Noncredible ADHD group performed poorer than credible ADHD group (however, scores still in believable range) |
| | | - Letter-Word Identification (WJPB; Woodcock et al. 2001) | Scores in believable range[b] |
| | | - Processing Speed (WJPB; Woodcock et al. 2001) | Scores in believable range[b] |
| | | - Reading Fluency (WJPB; Woodcock et al. 2001) | Scores in believable range[b] |
| | | - Visual Matching (WJPB; Woodcock et al. 2001) | Scores in believable range[b] |
| | | - Word Attack (WJPB; Woodcock et al. 2001) | Scores in believable range[b] |
| | | - Family Pictures (WMS; Wechsler 1997b) | Noncredible ADHD group performed poorer than credible ADHD group (however, scores still in believable range) |
| | | - Logical Memory (WMS; Wechsler 1997b) | Noncredible ADHD group performed poorer than credible ADHD group (however, scores still in believable range) |
| | | - Reading Comprehension (NDRT; Brown et al. 1993) | Scores in believable range[b] |
| | | - Reading Vocabulary (NDRT; Brown et al. 1993) | Scores in believable range[b] |
| Marshall et al. (2010) | RD | - C-CPT-II (Conners 2000) | Scores in believable range[b] |
| | | - Digit Symbol (WAIS-III; Wechsler 1997a) | Noncredible ADHD group performed poorer than credible ADHD group (however, psychometric properties indicate inadequate sensitivity in detecting low effort/feigning) |
| | | - Color-Word Interference (DKEFS; Delis et al. 2001) | Noncredible ADHD group performed poorer than credible ADHD group (however, psychometric properties indicate inadequate sensitivity in detecting low effort/feigning) |
| | | - NAB Number and Letters Test (White and Stern 2003) | Scores in believable range[b] |
| | | - Symbol Search (WAIS-III; Wechsler 1997a) | Noncredible ADHD group performed poorer than credible ADHD group (however, psychometric properties indicate inadequate sensitivity in detecting low effort/feigning) |

**Table 3** continued

| References | Study design | Measure(s) | Result |
|---|---|---|---|
| Sollman et al. (2010) | SD | - C-CPT-II (Conners and Staff 2004) | ADHD simulators performed poorer than genuine ADHD patients (however, scores still in believable range) |
| | | - Reading Speed (NDRT; Brown et al. 1993) | Scores in believable range[a] |
| | | - Stroop Color-Word Test (Golden 1978; Golden and Freshwater 2002) | ADHD simulators performed poorer than genuine ADHD patients |
| | | - Word Lists (WMS; Wechsler 1997b) | Scores in believable range[a] |
| Suhr et al. (2011a) | RD | - Continuous Performance Test (CPT; Conners 2000) | Scores primarily in believable range[b] |

*SD* simulation study design, *RD* retrospective study design/archival (clinical) data, *C-CPT-II* Conners Continuous Performance Test-II, *CVLT-2* California Verbal Leaning Test (2nd ed.), *DKEFS* Delis–Kaplan Executive Function System, *NDRT* Nelson–Denny Reading Test, *WAIS-III* Wechsler Adult Intelligence Scale (3rd ed.), *WJPB* Woodcock–Johnson Psychoeducational Battery, *WMS* Wechsler Memory Scale (3rd ed.)

[a] Instructed simulators were successful in feigning symptoms of ADHD

[b] Noncredible individuals could not been reliably distinguished from ADHD patients who gave credible effort

detecting feigned ADHD, Harp and colleagues (2011) could only confirm the usefulness of one scale of the newer version of the MMPI-2 (MMPI-2-RF; Ben-Porath and Tellegen 2008), i.e., infrequent responses of psychopathology (Fp or Fp-r). Furthermore, another personality inventory, the Personality Assessment Inventory (PAI; Morey 1991), did not show sufficient sensitivity in detecting feigned ADHD (Sullivan et al. 2007). However, a recent study using the adolescent version of the PAI (PAI-A; Morey 2007) in adolescents and young adults provided very clear evidence for the effectiveness of the PAI-A in detecting those who simulate ADHD (Rios and Morey 2013). In conclusion, personality inventories show some promise, however further research is necessary to confirm their usefulness and to provide clear rules and cut-off scores for clinical decision making.

Studies on the usefulness of cognitive tests (Table 3) routinely used in neuropsychological assessment demonstrated that instructed simulators can produce cognitive profiles on neuropsychological tests which resemble test profiles of patients with a diagnosed ADHD (Musso and Gouvier 2014). Simulators scored often very similar to patients and even if there were significant differences between simulators and patients, their test scores were often still in the believable range (within one standard deviation) so that their performance would still be considered clinically to indicate the presence of ADHD (Musso and Gouvier 2014). As pointed out by Solman and colleagues (2010), simulators did not only score in the believable range of performance but also showed poor performances in those variables in which patients with ADHD frequently show impairments (e.g., omission errors) so that their test profile was clinically consistent with ADHD. In general, cognitive tests therefore appear to be insufficient to detect feigned ADHD with reasonable accuracy. However, it has to be considered that various tests measuring various aspects of cognition have been applied and that there are differences in the usefulness between tests and functions assessed in studies. As Musso and Gouvier (2014) suggested, a closer look on the results of studies performed reveals that the most promising neuropsychological tests used in routine assessments are tests that measure aspects of attention and processing speed, such as the Continuous Performance Test (Conners 1995) or the Stroop Test (Golden 1978).

The most promising and sensitive measures in detecting feigned ADHD have been shown to be the measures (so-called stand-alone effort tests) which were originally developed and specifically designed to detect feigning of cognitive dysfunction as a consequence of acquired brain lesions (including symptom validity tests, Table 4). While the application of single stand-alone effort tests have a moderate sensitivity, the ability to detect feigned ADHD

**Table 4** Tests and indices primarily used for the detection of feigning (e.g., stand-alone effort tests)

| References | Study design | Measure(s) | Result |
|---|---|---|---|
| Frazier et al. (2008) | SD | - Rey Fifteen-Item Test (Rey, 1964)<br>- Validity Indicator Profile (VIP; Frederick 2002)<br>- Victoria Symptom Validity Test (VSVT; Slick et al. 1997) | No conclusion can be drawn because no patient group has been included |
| Suhr et al. (2008) | RD | - Auditory Verbal Learning Test–Exaggeration Index (EIAVLTX; Barrash et al. 2004) | High specificity, however, low sensitivity |
| | | - Auditory Verbal Learning Test Recognition Score (Boone et al. 2005; Meyers et al. 2001) | Noncredible ADHD group performed poorer than credible ADHD group; high specificity, however, low sensitivity |
| | | - Digit Span Score (Iverson and Franzen 1994) | High specificity, however, low sensitivity |
| | | - Vocabulary–Digit Span Score (Greve et al. 2003) | Moderate specificity, however, low sensitivity |
| | | - Working Memory Index (Etherton et al. 2006) | Noncredible ADHD group performed poorer than credible ADHD group; high specificity, however, low sensitivity |
| Harrison et al. (2010) | RD | - Digit Span Validity Index (embedded in WAIS-III; Iverson and Tulsky 2003; Wechsler 1997a) | High specificity, however, low sensitivity |
| | | - Reliable Digit Span Validity Index (embedded in WAIS-III; Iverson and Tulsky 2003; Wechsler 1997a) | High specificity, however, low sensitivity |
| | | - Vocabulary–Digit Span Validity Index (embedded in WAIS-III; Iverson and Tulsky 2003; Wechsler 1997a) | Moderate specificity, however, low sensitivity |
| Marshall et al. (2010) | RD | - b Test (Boone et al. 2002b) | High specificity, however, low sensitivity |
| | | - C-CPT-II (Conners 2000) | High specificity, however, moderate sensitivity |
| | | - Dot Counting Test (Boone et al. 2002a) | High specificity, however, low sensitivity |
| | | - Forced Choice Recognition Test (CVLT-II; Delis et al. 2000; Root et al. 2006) | High specificity, however, low sensitivity |
| | | - Reliable Digit Span Score (Babikian et al. 2006) | High specificity, however, low sensitivity |
| | | - Sentence Repetition Test (Strauss et al. 2006) | High specificity, however, low sensitivity |
| | | - Test of Variables of Attention (TOVA; Greenberg et al. 1996) | High specificity, however, moderate sensitivity |
| | | - WMT (Green 2003) | High specificity, however, moderate sensitivity |
| Sollman et al. (2010) | SD | - DMT (Hiscock and Hiscock 1989) | ADHD simulators performed poorer than genuine ADHD patients; high specificity, however, moderate sensitivity |
| | | - Letter Memory Test (LMT; Inman et al. 1998; Schipper et al. 2008) | ADHD simulators performed poorer than genuine ADHD patients; high specificity, however, moderate sensitivity |
| | | - Miller Forensic Assessment of Symptoms Test (M-FAST; Miller 2001) | ADHD simulators performed poorer than genuine ADHD patients; high specificity, however, low sensitivity |
| | | - NV-MSVT (Green 2006) | ADHD simulators performed poorer than genuine ADHD patients; high specificity, however, moderate sensitivity |
| | | - TOMM (Tombaugh 1996) | ADHD simulators performed poorer than genuine ADHD patients; however, moderate sensitivity and specificity |
| Jasinski et al. (2011) | SD | - b Test (Boone et al. 2000) | ADHD simulators performed poorer than genuine ADHD patients; high specificity, however, low sensitivity |
| | | - DMT (Hiscock and Hiscock 1989) | ADHD simulators performed poorer than genuine ADHD patients; high specificity, however, low sensitivity |
| | | - Letter Memory Test (LMT; Inman et al. 1998) | ADHD simulators performed poorer than genuine ADHD patients; high specificity, however, low sensitivity |
| | | - NV-MSVT (Green 2006) | ADHD simulators performed poorer than genuine ADHD patients; high specificity, however, low sensitivity |
| | | - TOMM (Tombaugh 1996) | ADHD simulators performed poorer than genuine ADHD patients; high specificity, however, low sensitivity |

*SD* simulation study design, *RD* retrospective study design/archival (clinical) data, *C-CPT-II* Conners Continuous Performance Test-II, *CVLT-II* California Verbal Learning Test-II, *DMT* Digit Memory Test, *NV-MSVT* Green's Nonverbal-Medical Symptom Validity Test, *TOMM* Test of Memory Malingering, *WAIS-III* Wechsler Adult Intelligence Scale (3rd ed.), *WMT* Word Memory Test

can be markedly increased by a combined application of several effort tests (Frazier et al. 2008; Marshall et al. 2010; Sollman et al. 2010; Jasinski et al. 2011; Musso and Gouvier 2014). However, there are concerns that many stand-alone effort tests might be too easy so that their clinical usefulness is undermined by the fact that those feigning ADHD might look through the principle of these tasks (Musso and Gouvier 2014). In this context, it is important to consider that feigned ADHD is a phenomenon seen in young people and highly educated students (see above). Musso and Gouvier (2014), therefore, concluded on the basis of their comprehensive literature review that there is an urgent need for stand-alone effort tests which are specifically designed for the identification of feigned ADHD.

## Conclusion

In summary, feigning of ADHD is a problem as indicated by reports of increased rates of suspected feigning and symptom exaggeration (Sullivan et al. 2007; Suhr et al. 2008). Feigning ADHD might be motivated by various reasons such as academic accommodation and, in particular, access to stimulant drugs (Sansone and Sansone 2011; Green and Rabiner 2012; Pella et al. 2012; Rabiner 2013) and has manifold and vast consequences for society including, among others, a waste of money and other resources. The problem has been recognized, however only little research has been performed yet and there is a lack of sensitive tools which can be used in clinical practice, so that the problem is far from being solved. Despite some approaches and measures have already been shown to be promising, the relevant next steps in validating measures and translating findings into new measures and approaches are unfortunately missing.

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