

Multidimensional Malingering Criteria for Neuropsychological Assessment: A 20-Year Update of the Malingered Neuropsychological Dysfunction Criteria

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Abstract

Objectives: Empirically informed neuropsychological opinion is critical for determining whether cognitive deficits and symptoms are legitimate, particularly in settings where there are significant external incentives for successful malingering. The Slick, Sherman, and Iverson (1999) criteria for malingered neurocognitive dysfunction (MND) are considered a major milestone in the field's operationalization of neurocognitive malingering and have strongly influenced the development of malingering detection methods, including serving as the criterion of malingering in the validation of several performance validity tests (PVTs) and symptom validity tests (SVTs) (Slick, D.J., Sherman, E.M.S., & Iverson, G. L. (1999). Diagnostic criteria for malingered neurocognitive dysfunction: Proposed standards for clinical practice and research. *The Clinical Neuropsychologist*, 13(4), 545–561). However, the MND criteria are long overdue for revision to address advances in malingering research and to address limitations identified by experts in the field.

Method: The MND criteria were critically reviewed, updated with reference to research on malingering, and expanded to address other forms of malingering pertinent to neuropsychological evaluation such as exaggeration of self-reported somatic and psychiatric symptoms.

Results: The new proposed criteria simplify diagnostic categories, expand and clarify external incentives, more clearly define the role of compelling inconsistencies, address issues concerning PVTs and SVTs (i.e., number administered, false positives, and redundancy), better define the role of SVTs and of marked discrepancies indicative of malingering, and most importantly, clearly define exclusionary criteria based on the last two decades of research on malingering in neuropsychology. Lastly, the new criteria provide specifiers to better describe clinical presentations for use in neuropsychological assessment.

Conclusions: The proposed multidimensional malingering criteria that define cognitive, somatic, and psychiatric malingering for use in neuropsychological assessment are presented.

Keywords: malingering; exaggeration; malingered neurocognitive dysfunction; feigning; performance validity; symptom validity; effort; response bias; PVT; SVT

Introduction

Empirically informed neuropsychological opinion is crucial for determining whether cognitive deficits are legitimate. This is because neuropsychologists are one of the few assessment professionals who have sophisticated, evidence-based tools to make

Table 1. Examples of known-group studies that have used the MND criteria as the standard for determining empirically based PVT cutoffs, by PVT

| PVT | Study |
|--------------------------------------|---|
| Test of Memory Malingering (TOMM) | Buddin et al. (2014), Green, Rosenfeld, Belfi, Rohlehr, and Pierson (2012), Greve, Ord, Curtis, Bianchini, and Brennan (2008), Jones (2013), O'Bryant, Engel, Kleiner, Vasterling, and Black, (2007), and Smith et al. (2014) |
| Word Memory Test (WMT) | Greve, Ord, Curtis, Bianchini, and Brennan (2008), Fazio, Sanders, and Denney (2015), Fazio, Sanders, and Denney (2015), and Marshall et al. (2010) |
| b Test | Vilar-López, Gómez-Río, Caracuel-Romero, Llamas-Elvira, and Pérez-García (2008), Smith et al. (2014), and Roberson et al. (2013) |
| Victoria Symptom Validity Test | Jones (2013) |
| Dot Counting Test | Vilar-López, Gómez-Río, Caracuel-Romero, Llamas-Elvira, and Pérez-García (2008) |
| Medical Symptom Validity Test (MSVT) | Whitney, Shepard, Williams, Davis, and Adams (2009) |

this determination. Neuropsychological opinion is therefore critically important in settings where there are external incentives for successfully feigning, exaggerating, or fabricating cognitive deficits. External incentives for malingering may be financial, such as monetary settlements in personal injury litigation and wage replacement in disability and workers' compensation claims, but may also include avoidance of duties or responsibilities, such as discharge from military service, and avoidance of criminal prosecution or harsher criminal sentencing. Outside of legal and forensic settings, certain clinical diagnoses bring with them financial support and access to services (e.g., intellectual disability), accommodations in academic and work settings (e.g., ADHD, learning disability), or access to controlled substances including narcotics or stimulants (e.g., chronic pain, ADHD).

The percentage of examinees who feign, exaggerate, or fabricate cognitive deficits during neuropsychological evaluation is substantial, and although estimates vary depending on the sample, ranges from less than 10% in medical populations without external incentives (e.g., Wodushek & Domen, 2018) up to 40% in personal injury and disability evaluations (Larrabee, Millis, & Meyers, 2009; Mittenberg, Patton, Canyock, & Condit, 2002; Ruff, Klopfer, & Blank, 2016), up to 60% in social security applicants (Chafetz, 2008), up to 50% or higher in criminal justice, penal, and military settings (Ardolf, Denney, & Houston, 2007; Jones, 2016), up to 50% in pain clinics (Greve, Binder, & Bianchini, 2009), and up to 50% in college settings where ADHD is assessed (Marshall et al., 2010; Musso & Gouvier, 2014; Suhr, Hammers, Dobbins-Buckland, Zimak, & Hughes, 2008; Sullivan, May, & Galbally, 2007).

The Slick, Sherman, and Iverson (1999) Malingered Neurocognitive Dysfunction Criteria

The Slick, Sherman, and Iverson criteria for malingered neurocognitive dysfunction (MND) (Slick, Sherman, & Iverson, 1999) are the most widely accepted model for identifying malingering of cognitive deficits. The Slick et al. criteria are considered a major milestone in the field's operationalization of cognitive malingering and have continued to stand the test of time as the malingering criteria with the most empirical research. The American Academy of Clinical Neuropsychology (Heilbronner et al., 2009) deemed the criteria to be more representative of the current state of neuropsychological knowledge on malingering than other malingering criteria including those of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV, now DSM-5; American Psychiatric Association, 2013). In the years since publication, the criteria influenced the development of other malingering criteria such as the malingered pain-related disability (MPRD) criteria (Bianchini, Greve, & Glynn, 2005). The MND criteria have been referenced numerous times since their publication in 1999 (Garcia-Willingham, Bosch, Walls, & Berry, 2018), with over 700 citations to date (www.researchgate). The criteria also strongly influenced the development of malingering detection methods (Bender & Frederick, 2018; Chafetz et al., 2015) and assumed a prominent role in the literature as the validation criterion for performance validity test (PVT) and symptom validity test (SVT) cutoffs. Almost all the most commonly used PVTs and many commonly used SVTs have cutoffs that were specifically calibrated and validated based on their ability to detect MND in known groups as defined by the criteria (see Tables 1 and 2 for studies to date). No other malingering frameworks have been studied to this degree in verified malingerers and in people with a variety of clinical conditions (i.e., known groups).

In the original malingering framework, the term "MND" was defined as "the volitional exaggeration or fabrication of cognitive dysfunction for the purpose of obtaining substantial material gain or avoiding or escaping formal duty or responsibility" (Slick, Sherman, & Iverson, 1999, p. 552). Substantial material gain was defined as anything of nontrivial value, such as financial compensation for personal injury. Formal duties were defined as actions people are legally obligated to perform, such as military service, and formal responsibilities were those that involved accountability in legal proceedings, such as competency to stand trial. Malingering was defined according to three different "diagnostic categories": (a) "Definite MND", defined by

Table 2. Examples of known-group studies that have used the MND criteria as the standard for determining empirically based SVT cutoffs, by SVT

| Scale | SVT score | Study |
|--|---|---|
| Minnesota Multiphasic Personality Inventory-2 (MMPI-2) and Minnesota Multiphasic Personality Inventory-2 Restructured Form (MMPI-2-RF) | Symptom Validity Scale (FBS) | Dionysus, Denney, and Halfaker (2011), Greve, Bianchini, Love, Brennan, and Heinly (2006), Henry, Heilbronner, Mittenberg, and Enders (2006), Jones (2016), Larrabee (2003b), and Peck et al. (2013) |
| | Symptom Validity Scale—Restructured (FBS-r) | Jones (2016), Nguyen, Green, and Barr (2015), Schroeder et al. (2012), Tarescavage, Wygant, Gervais, and Ben-Porath (2013), and Wygant et al. (2011) |
| | Response Bias Scale (RBS) | Dionysus, Denney, and Halfaker (2011), Jones (2016), Nguyen, Green, and Barr (2015), Peck et al. (2013), Sullivan, Elliott, Lange, and Anderson (2013), Tarescavage, Wygant, Gervais, and Ben-Porath (2013), and Wygant et al. (2011) |
| | Infrequent Somatic Responses (Fs) | Jones (2016), Nguyen, Green, and Barr (2015), Schroeder et al. (2012), Tarescavage, Wygant, Gervais, and Ben-Porath (2013), and Wygant et al. (2011) |
| Structured Inventory of Malingered Symptomatology (SIMS) | Henry–Heilbronner Index (HHI)/(HHI-r) | Henry, Heilbronner, Mittenberg, and Enders (2006), Henry, Heilbronner, Algina, and Kaya (2013), Dionysus, Denney, and Halfaker (2011), and Jones (2016) |
| | Total Score | Wisdom, Callahan, and Shaw (2010) |

clear and compelling evidence of volitional exaggeration or fabrication of cognitive dysfunction, (b) “Probable MND”, defined by evidence strongly suggestive of volitional exaggeration or fabrication of cognitive dysfunction, and (c) “Possible MND”, defined by the presence of evidence suggestive of volitional exaggeration or fabrication of cognitive dysfunction or by meeting criteria for Definite or Probable MND except that other primary etiologies (i.e., psychiatric, neurological, or developmental factors) could not be ruled out. Determining the specific criteria for the subtypes required reference to Criteria B (evidence from neuropsychological testing) and Criteria C (evidence from self-report). Thus, the Slick and colleagues model included evidence from self-report and SVTs in addition to PVTs. However, Criteria C (i.e., evidence based on self-report including SVTs) were deemed insufficient as the basis of a diagnosis of MND, but instead provided additional evidence in support of the diagnosis.

Limitations of the MND Criteria

As they move beyond their 20th anniversary, the Slick and colleagues criteria are long overdue for a revision. Updates are needed to address advances in the field of malingering research since publication of the criteria over two decades ago, including updates to the methods for determining malingering and related terminology. At the time, the authors noted that psychometric methods and instruments for detecting malingering were in a relatively early stage of development with most tests being experimental and lacking adequate normative data; the Slick and colleagues criteria referred to “forced-choice measures,” “psychometric measures,” “measures of psychological adjustment,” and “exaggerated or fabricated psychological dysfunction or distress” to refer to PVTs and SVTs because these terms were not yet established in the field (Larrabee, 2012a). This is clearly no longer the case, as illustrated by the multitude of books, book chapters, and peer-reviewed scientific papers on PVTs and SVTs.

A number of authors have recommended improvements to the MND criteria and have rightfully questioned the number of PVT failures needed to reach criteria, the lack of clear definition for criteria involving SVTs, the need to further define exclusionary criteria, and the need to better clarify the kinds of discrepancies indicative of feigning or fabrication (Boone, 2007, 2011; Larrabee, 2005; Merten & Merckelbach, 2013; Rogers, Bender, & Johnson, 2011a; Rogers, Bender, & Johnson, 2011b). There is also a need to align updates published in book chapters by the authors that addressed some but not all criticisms (Sherman, 2015; Slick & Sherman, 2012; Slick & Sherman, 2013), including that the external incentives from the MND model were too biased toward criminal and forensic settings and of limited utility in younger examinees. The MND criteria were felt to also benefit from simplification and streamlining of redundant content (Boone, 2011; Larrabee, 2005). From a practical perspective, the MND criteria were felt to be somewhat lengthy and cumbersome, and this may limit their ease of use and uptake in general clinical settings. The original MND criteria also suffered from some construct contamination. Specifically, the model was developed to define neurocognitive malingering, yet SVTs designed to detect psychiatric malingering were included in the criteria, leading to lack of clarity as to the construct tapped by the model.

Most importantly, the MND criteria did not address other forms of malingering pertinent to neuropsychological evaluation, most notably the exaggeration and feigning of somatic and psychiatric symptoms. Generally speaking, people who are malingering during a neuropsychological assessment may do so with a mixed picture of exaggerated cognitive, somatic, and

psychiatric symptoms (e.g., Boone, 2017; Gottfried & Glassmire, 2016; Greve, Bianchini, Love, Brennan, & Heinly, 2006; Larrabee, 2012b; Morgan & Sweet, 2009). Thus, as the field has matured, it has become evident that to be effective, a malingering model for use in neuropsychological assessment needs to be able to address the main ways in which malingering manifests in the neuropsychological examination including not only malingering of cognitive dysfunction, but also malingering of self-reported somatic and psychiatric symptoms.

For example, a malingering examinee seeking damages after mild brain injury may feign memory problems and exaggerate self-reported headache, light sensitivity, and dizziness, whereas a disability claimant may feign chronic pain and psychological symptoms such as depression to avoid returning to work. A returning military service member may feign psychiatric symptoms such as severe post-traumatic stress disorder (PTSD), but another examinee falsely seeking income replacement for intellectual disability may feign cognitive problems but not psychiatric symptoms. Conversely, in criminal settings, a malingering examinee may feign cognitive deficits in combination with extreme psychiatric symptoms including dramatic psychotic symptoms to avoid criminal prosecution, a presentation rarely seen in other settings associated with neurocognitive malingering such as ADHD clinics, where exaggeration tends to be much more selective (e.g., involving attention and memory, but not extreme psychiatric disturbance). A malingering model focused exclusively on cognitive exaggeration will miss other kinds of malingered presentations which vary depending on the nature of the external incentive, the setting, and the type of clinical condition being feigned or exaggerated. In line with this view, Greve and colleagues have noted that multidimensional disability in civil litigation—including somatic and psychiatric presentations—may be related to incentives for having deficits in multiple dimensions and that an effective malingering model should take into account malingering in domains other than cognition (Greve, Bianchini, Love, Brennan, & Heinly, 2006). This parallels the broader field of malingering of mental disorders where there is a movement toward identifying specific conditions being feigned rather than detecting a more general construct of malingering (Smith, 2018).

At present, other kinds of malingering models have limitations in some neuropsychological settings. For example, the DSM-5 malingering criteria define malingering as the intentional production of false or exaggerated physical or psychological symptoms. As such, these criteria could thus be applied by neuropsychologists in identifying somatic and psychiatric malingering, but not cognitive malingering. The DSM criteria have also been criticized as being poorly defined and vague and for giving equal value to criteria that may have quite different sensitivity to malingering detection (e.g., Gaillard, 2018). Strong recommendations to update the DSM-IV malingering criteria were made by experts in the field before the DSM-5 criteria were finalized, including the need to correct both conceptual and practical flaws such as criteria that are dependent on the characteristics of the setting or examinee (e.g., forensic setting, antisocial personality disorder), use of questionable criteria such as lack of cooperation in the treatment or assessment process, and for not appearing to consider over 30 years of empirical and theoretical work on malingering (Berry & Nelson, 2010); none appear to have been considered for the DSM-5. Similarly, other models of psychiatric malingering such as the Resnick and colleagues model for malingered PTSD (Resnick, West, & Wooley, 2018), although needed in the field, have significant limitations including criteria depending heavily on the personal characteristics and background of the examinee, circular criteria such as “evidence for malingering” as part of the malingering criteria themselves, SVT evidence that is not well defined, and inclusion of criteria that may be quite common in the general population and in people with bona fide PTSD (e.g., absence of nightmares, job dissatisfaction).

With regard to somatic malingering, a few years after publication of the MND criteria, Bianchini and colleagues developed criteria specifically aimed at the detection of malingered pain-related disability for use in neuropsychological assessment derived from the MND model (MPRD; Bianchini, Greve, & Glynn, 2005). Exaggeration of pain is one of the most common presentations of malingering in neuropsychological assessment settings relating to personal injury, disability evaluations, and unexplained medical conditions (see Boone, 2017, for a comprehensive review, as well as Greve, Bianchini, & Ord, 2012, among others). The MPRD model was an advancement in the field in that it was the only well-defined conceptual model for identifying an important facet of somatic malingering (e.g., exaggeration of pain-related disability). Like the MND criteria, the MPRD criteria were subsequently used to calibrate and validate several PVT and SVT cutoffs for use in examinees presenting with pain (Bianchini et al., 2018; Wygant et al., 2011). However, the MPRD criteria were also criticized for using evidence of cognitive or psychiatric malingering (i.e., PVT or SVT test failure) as criteria for pain malingering (Bender & Frederick, 2018; Tuck, Johnson, & Bean, 2019). From a practical standpoint, the MPRD criteria have limited usability in neuropsychological settings that do not have ready access to medical, physiotherapy, and functional capacity evaluations, results of which comprise components of the criteria (i.e., Criteria B). A model that incorporates somatic over-reporting and that allows broader application to other settings would thus be of benefit.

In sum, the field is in need of guidance not only on how to best identify MND given updates to research on malingering since the original MND criteria were published 20 years ago, but also on how to identify malingering in other domains.

Reconceptualizing Malingering in Neuropsychological Assessment

New proposed multidimensional malingering criteria for use in neuropsychological evaluation are presented in [Box 1](#). The multidimensional model is based on the original MND model but expands and better defines the criteria to include a variety of malingering presentations (i.e., neurocognitive, somatic, psychiatric, and mixed symptom presentation). The intent of these revised criteria is to replace the 1999 MND criteria by addressing limitations of the original MND model and to expand the criteria beyond cognitive malingering to provide additional criteria for the identification of additional forms of malingering for use in neuropsychological assessment.

Box 1. Multidimensional Criteria for Neurocognitive, Somatic, and Psychiatric Malingering.

Malingering is the volitional feigning or exaggeration of neurocognitive, somatic, or psychiatric symptoms for the purpose of obtaining material gain and services or avoiding formal duty, responsibility, or undesirable outcome. It is indicated by clear and compelling evidence based on the four criteria listed as follows (Criteria A–D).

A. PRESENCE OF AN EXTERNAL INCENTIVE

A clearly identifiable and substantial external incentive for feigning or exaggeration of deficits or symptoms is present at the time of examination.

External incentives for malingering include access to a desirable outcome such as financial settlement, disability payment, wage replacement, social assistance, access to services or accommodations in community, academic, or work settings, or access to prescription medication.

External incentives may also include avoidance of an undesirable outcome such as those related to criminal proceedings (e.g., avoiding being deemed competent to stand trial or avoiding criminal sentencing), military service (e.g., avoiding deployment), or work or school settings (e.g., avoiding probation, suspension, expulsion, or termination). Avoidance of an undesirable outcome in the context of malingering may also be adaptive (e.g., feigning illness to avoid being returned to an abusive situation). External incentives for malingering may also include avoiding having to fulfill more basic duties and responsibilities such as avoiding work, school examinations, or home responsibilities.

The kinds of evaluations associated with external incentives for malingering include those related to personal injury litigation, determination of disability benefits and workers' compensation, social services eligibility, criminal proceedings, military evaluations, and evaluations for specific clinical diagnoses that are associated with external incentives, such as those for brain injury, intellectual disability, chronic pain and related conditions, unexplained medical or neurological symptoms, ADHD, and learning disability, among others.

B. INVALID PRESENTATION ON EXAMINATION INDICATIVE OF FEIGNING OR EXAGGERATION

On examination of the examinee, there is either (a) compelling inconsistencies indicative of deliberate exaggeration or feigning of deficits or symptoms or (b) psychometric evidence of exaggeration or feigning of deficits or symptoms on performance validity tests (PVTs) or symptom validity tests (SVTs).

Compelling inconsistencies are observations during the examination that indicate definitive evidence of feigning or exaggeration. They are defined as clear and compelling evidence indicative of feigning or exaggeration of neurocognitive, somatic, or psychiatric deficits or symptoms observed or documented during the evaluation (e.g., unequivocal demonstration of disputed capacity when the examinee thinks he or she is unobserved; clear discrepancies between skills observed during the interview or while in the evaluation setting that are highly implausible and that indicate feigning, dissimulation, or distortion of symptoms). Note that compelling inconsistencies that are documented in written, audio, video, or electronic form such as social media would be included under Criterion C (Marked Discrepancies) because they form part of the records or documentation for the case rather than part of the direct examination of the patient.

Performance validity tests (PVTs) are objective tests designed to detect invalid cognitive performance.

Symptom validity tests (SVTs) are self-report scales or structured interviews that measure over-reporting of self-reported cognitive, somatic, or psychiatric symptoms.

To meet criteria for Invalid Presentation on Examination Indicative of Feigning or Exaggeration, the examinee must present with one or more of the following criteria.

1. Invalid Neurocognitive Presentation. One or more of a, b, or c must be present.

- a. *One or more compelling inconsistencies pertaining to cognitive deficits or symptoms are observed or documented during the evaluation.*
- b. *Invalid Scores on PVTs.*
Psychometric evidence of invalid cognitive test performance based on (a) using at minimum two or more PVTs that alone or in combination have a low false-positive rate (i.e., .10), while (b) taking into account the ratio of failed PVT scores to total number of PVTs administered, (c) minimizing PVT redundancy, and (d) using PVT cutoffs that have been validated in clinical studies. Obtaining one PVT in the significantly below-chance range also would meet this criterion (i.e., significantly below-chance performance on forced-choice tests based on binomial probability theory).
- c. *Psychometric evidence of exaggerated cognitive symptoms on SVTs.*
Psychometric evidence of exaggerated symptom reporting using SVTs that alone or in combination have a low false-positive rate (i.e., .10). For example, one or more SVT scores measuring primarily feigned or exaggerated cognitive symptoms in the invalid range using (a) SVTs with an acceptable false-positive rate, (b) tests that provide non-redundant information, and (c) SVTs that have cutoffs that have been validated in clinical studies would meet this criterion.

2. Invalid Somatic Symptom Presentation. One or both of a or b must be present.

- a. *One or more compelling inconsistencies pertaining to somatic symptoms are observed or documented during the evaluation.*
- b. *Psychometric evidence of exaggerated somatic symptoms on SVTs.*
Psychometric evidence of exaggerated symptom reporting using SVTs that alone or in combination have a low false-positive rate (i.e., .10). For example, one or more SVT scores measuring primarily feigned or exaggerated somatic symptoms in the invalid range using (a) SVTs with an acceptable false-positive rate, (b) SVTs that provide non-redundant information, and (c) SVTs that have cutoffs that have been validated in clinical studies would meet this criterion.

3. Invalid Psychiatric Presentation. One or both of a or b must be present.

- a. *One or more compelling inconsistencies pertaining to psychiatric symptoms are observed or documented during the evaluation.*
- b. *Psychometric evidence of exaggerated psychiatric symptoms on SVTs.*
Psychometric evidence of exaggerated symptom reporting using SVTs that alone or in combination have a low false-positive rate (i.e., .10). For example, one or more SVT scores measuring primarily feigned or exaggerated psychiatric symptoms in the invalid range using (a) SVTs with an acceptable false-positive rate, (b) SVTs that provide non-redundant information, and (c) SVTs that have cutoffs that have been validated in clinical studies would meet this criterion.

4. Invalid Mixed Symptom Presentation.

Evidence of compelling inconsistency and/or psychometric evidence of invalid or exaggerated PVT or SVT results across two or more of cognitive, somatic, or psychiatric domains.

For example, the following would each satisfy this criterion:

- Two or more compelling inconsistencies across domains (i.e., two or more of B1a, B2a, or B3a).
- Psychometric evidence in more than one domain (i.e., two or more among B1b, B1c, B2b, or B3b).
- One or more compelling inconsistencies combined with psychometric evidence of invalid or exaggerated deficits or symptoms in one or more domains (i.e., one or more compelling inconsistencies with one or more of either of B1b, B1c, B2b, or B3b).

C. MARKED DISCREPANCIES

One or more marked discrepancies between obtained test data/symptom report and the types of evidence are present, as follows:

1. *Natural history and pathogenesis of the condition in question.*

Information obtained by self-report or through tests or scales is markedly discrepant from currently accepted models of normal and abnormal neurological, medical, or psychiatric functioning in a way that suggests feigning or exaggeration of deficits or symptoms.

2. *Records and other media.*

Information obtained by self-report or through tests or scales is markedly inconsistent with records or other documented history (e.g., audio, video, social media) in a way that suggests feigning or exaggeration of deficits or symptoms.

3. *Reliable collateral informant report.*

Information obtained by self-report or through tests or scales is markedly discrepant from day-to-day level of function described by at least one reliable collateral informant with minimal stakes in the outcome of the evaluation, in a way that suggests feigning or exaggeration of dysfunction.

D. BEHAVIORS MEETING CRITERION B ARE NOT FULLY ACCOUNTED FOR BY ANOTHER DEVELOPMENTAL, MEDICAL, OR PSYCHIATRIC CONDITION

Behaviors meeting Criterion B are assumed to reflect an informed, rational, and volitional attempt toward acquiring or achieving outcomes as defined in Criterion A and cannot be fully accounted for by significant developmental, medical, or psychiatric conditions that result in significantly diminished capacity to appreciate laws or mores against malingering or inability to conform behavior to such standards. Examples of significant developmental, medical, and psychiatric conditions are listed as follows:

- Moderate to severe dementia.
- Moderate to severe intellectual disability (e.g., IQ < 60).
- Severe psychiatric, neurological, or other medical disorders associated with cognitive impairment sufficient to preclude independence in basic activities of daily living.

Malingering can co-occur in conditions associated with cognitive deficits including mild intellectual disability, mild dementia, or mild cognitive impairment. Similarly, malingering can co-occur in psychiatric or neurological conditions defined by somatoform symptoms (e.g., somatic symptom disorder, conversion disorder/functional neurological symptom disorder, factitious disorder, unexplained medical symptoms) and in the presence of other psychiatric conditions (e.g., depression).

SPECIFIERS

The four specifiers for the clinical presentation of malingering are described as follows.

Malingering of Neurocognitive Dysfunction

In addition to meeting Criteria A, C, and D, the individual meets Criterion B1a, B1b, or B1c for feigned or exaggerated cognitive dysfunction, that is, one or more of the following:

- A compelling inconsistency pertaining to cognitive deficits or symptoms.
- Invalid cognitive performance as demonstrated by performance validity tests.
- Invalid cognitive symptoms as demonstrated by symptom validity tests.

Malingering of Somatic Symptoms

In addition to meeting Criteria A, C, and D, the individual meets Criterion B2a or B2b for feigned or exaggerated somatic symptoms, that is, either of the following:

- A compelling inconsistency pertaining to somatic symptoms.
- Invalid somatic symptom report as demonstrated by symptom validity tests.

Malingering of Psychiatric Symptoms

In addition to meeting Criteria A, C, and D, the individual meets Criterion B3a or B3b for feigned or exaggerated psychiatric symptoms, that is, either of the following:

- A compelling inconsistency pertaining to psychiatric symptoms.
- Invalid psychiatric symptom report on symptom validity tests.

Malingering with Mixed Presentation

In addition to meeting Criteria A, C, and D, the individual meets Criterion B4 for feigned or exaggerated symptoms in more than one domain (i.e., cognitive, somatic, and/or psychiatric).

The proposed Multidimensional Criteria for Neurocognitive, Somatic, and Psychiatric Malingering define malingering according to four key components defined as the presence of (a) a substantial external incentive (Criterion A); (b) invalid presentation indicative of feigning or exaggeration (Criterion B); (c) marked discrepancies between obtained test data/symptom report and other kinds of evidence (Criterion C); and in which (d) the invalid presentation cannot be fully accounted for by another developmental, medical, or neurological condition (Criterion D). Using these specific criteria, the model defines four types of malingering: (a) Malingering of Neurocognitive Dysfunction, (b) Malingering of Somatic Symptoms, (c) Malingering of Psychiatric Symptoms, and (d) Malingering with Mixed Presentation.

The multidimensional malingering criteria take into account the recommendations for improving the 1999 MND criteria and those of other malingering models in order to (a) simplify diagnostic categories for clinical use, (b) expand and clarify external incentives, (c) more clearly include the role of compelling inconsistencies as *prima facie* evidence of feigning or exaggeration, (d) update and redefine the number of PVT and SVT failures needed to reach criteria, (e) address the issue of false positives when using PVTs and SVTs, (f) better define the role of SVTs in malingering determination, (g) add specifiers related to malingering presentation, and most importantly, (h) clearly define the exclusionary criteria based on the last decades of research on malingering in neuropsychology.

In particular, the criteria include an important change compared to the original MND criteria in light of critical considerations regarding the PVTs' false-positive rate in malingering detection. That is, if multiple PVTs are considered in an evaluation, it is relatively common to perform poorly on one PVT. A single low PVT score as the criterion for PVT failure will thus result in an unacceptably high false-positive rate—especially in people with limited education or below-average intellectual abilities—because there will be an increased risk of falsely identifying valid test results as invalid. The new criteria therefore emphasize that failure on a single PVT, when multiple PVTs are administered, is insufficient to meet the psychometric criterion for invalid test data, unless that score is in the significantly below-chance range. The rationale for these and other changes and updates is explained in detail in the following sections.

Format and Categories of Malingering

One major impetus for updating the original MND criteria was to simplify and organize the decision process needed to make a determination of malingering. Most clinicians engage in a dichotomous decision process when faced with clinical test findings suggestive of exaggeration or feigning, asking themselves: is the examinee malingering or not? Using the original MND criteria, the process for making this decision was complex and cumbersome; the practitioner had to consider three types of malingering, each with slightly different criteria (i.e., Definite, Probable, and Possible MND) presented in a three-part table listing the criteria required for each subtype that then had to be referenced to a specific constellation of criteria for each subtype listed in a second table (Criteria B) and consisting of several heterogeneous types of information including test data, symptom report, and documentation. In all, 11 separate criteria and 3 diagnostic categories had to be simultaneously considered to determine which MND category the profile matched.

This cumbersome process differs from that of other diagnostic systems, most notably the DSM-5. In DSM-5, there is a single set of diagnostic criteria for each diagnosis. Subtype and severity gradations are then specified once the criteria are met, as a separate step—the so-called “specifiers” for each diagnosis. The new criteria therefore follow the more generally accepted DSM format. This makes the criteria more user-friendly, follows a well-known and time-tested diagnostic approach, and as such, likely increases the likelihood that users will employ the criteria in their evaluations and correctly apply them in research. Therefore, instead of three different types of malingering, the revised criteria present a unitary definition of malingering attained via a binary decision process (present/not present), with specifiers regarding severity and clinical presentation assigned in a second step.

The decision to use one unitary versus three diagnostic categories for malingering was also made based on the research literature. Specifically, the prior Possible and Definite MND categories were found to be problematic as main diagnostic categories. The Possible MND category is conceptually problematic due to its intermediate status (i.e., it might be malingering or it might not be malingering) and by the fact that it depends either on self-report which could be poorly defined based on the model, or by exclusion, predicated on failure to meet criteria for either Probable or Definite MND. Thus, it appears rarely in the literature; the vast majority of clinical studies across a variety of settings and clinical groups have divided examinees into malingering and non-malingering using combined Probable and Definite MND categories and have omitted or eliminated examinees meeting criteria for Possible MND in group comparisons (Fazio & Denney, 2018; Greve, Ord, Curtis, Bianchini, & Brennan, 2008; Jones, 2016; Tuck, Johnson, & Bean, 2019; Whitney, Shepard, Williams, Davis, & Adams, 2009), with only a small number of studies collapsing all three categories into one general malingering category (e.g., Sullivan, Elliott, Lange, & Anderson, 2013). Further, there is some indication that Probable and Definite categories may not differ clinically from each other (Curtis, Greve, Bianchini, & Brennan, 2006; Greve, Bianchini, Love, Brennan, & Heinly, 2006; Heinly, Greve, Bianchini, Love, & Brennan, 2005; Larrabee, 2003a), providing support for collapsing these two categories.

In the MND criteria, Definite MND was defined by significantly below-chance performance on forced-choice tests based on binomial probability theory, that is, a score that fell below a large confidence interval around chance that was defined as 90% or higher (Slick, Sherman, & Iverson, 1999). Work by Binder and colleagues has further recommended that significantly below-chance performance be defined according to one-tailed *p* values and a significance level of .20 or higher for standardized forced-choice tests with empirically derived cutoffs (Binder, Larrabee, & Millis, 2014). However, the Definite category of malingering appears to describe only a small subgroup of malingering examinees. When the original criteria were created, we expected that a significant proportion of malingering examinees would present with significantly below-chance scores on PVTs. However, subsequent research did not bear this out. A minority of malingering examinees actually meet the Definite MND criteria; research now indicates that significantly below-chance performance on PVTs misses many—if not most—bona fide malingerers (e.g., Chafetz, 2008; Greve, Binder, & Bianchini, 2009).

In addition to this, there are conceptual problems with the concept of a “Definite” category of malingering; do examinees who meet all other criteria including multiple PVT failures but not below-chance performance thus have a more uncertain malingering determination? Below-chance performance on PVTs is considered the proverbial “smoking gun of intent” (p. 385, Pankratz & Erickson, 1990); this differentiates it from all other failed scores on PVTs (i.e., those based on validated cutoffs) because it shows that the examinee deliberately chose wrong answers to appear cognitively impaired and thus proves deliberate deception on the part of the examinee. However, deliberate deception as a behavior is not exclusive to malingering; it is also the essential feature of factitious disorder, where intentional feigning, exaggeration, and induction of symptoms would be expected. Further, there appears to be little justification to elevating below-chance performance above other extreme or improbable indicators of deliberate deception, most notably compelling inconsistencies, which are now clearly part of the new criteria and which are discussed later in this paper. For these reasons, the Definite malingering option was eliminated. Nevertheless, it is important to emphasize that when all other criteria are met, below-chance PVT scores signal a more blatant or possibly more unsophisticated form of malingering where the degree of certainty of exaggeration is extremely high (Chafetz, 2008; Greve, Bianchini, Love, Brennan, & Heinly, 2006).

External Incentives (Criterion A)

In the original MND criteria, external incentives for malingering included financial gain, such as financial settlements in personal injury litigation and wage replacement in disability and workers’ compensation claims, but also included obtaining discharge from duty in the form of military service, criminal prosecution, or evading certain kinds of sentencing such as the death penalty in some countries. However, the criteria were criticized for focusing too much on forensic settings and for ignoring other settings where malingering occurs (e.g., Sherman, 2015). In addition, other settings associated with high base rates of malingering were not included (e.g., ADHD clinics).

The new criteria specify that external incentives include both attaining a desirable outcome and avoiding an undesirable outcome, including not only high-stakes undesirable outcomes (e.g., avoiding criminal prosecution) but also lower-stakes undesirable outcomes such as avoiding work or school. This includes mention of external incentives relevant to examinees seen in clinical settings such as hospitals, non-forensic private practices, community services allocating social services supports, and clinics and private practices where learning disability and ADHD evaluations are carried out to determine academic and work accommodations. The external incentives commonly seen in younger examinees outside of forensic and criminal settings also needed to be included, where avoiding duties and responsibilities such as attending school or participating in performances or events may be more common (e.g., standardized testing) when doing so confers external advantages to the examinee (as opposed to internal incentives such as gaining attention or status).

As noted in DSM-5, malingering may in some cases represent adaptive behavior (e.g., feigning illness while captive during wartime), and this was also added to the description of incentives. More common examples also include feigning illness to avoid school and thus evade bullying or feigning illness to avoid being discharged from hospital to an abusive home, or to stop a parental separation (e.g., Kirkwood, Kirk, Blaha, & Wilson, 2010; Peebles, Sabella, Franco, & Goldfarb, 2005).

It is important to note that many external incentives may also involve some degree of internal incentive (e.g., feigning a disabling head injury may bring disability payments but also increased attention and concern from family; faking concussion to stay home from school may confer both freedom from schoolwork and additional attention from loved ones). There is also a range of severity among external gains—for example, the goal of faking illness may be to gain more attention and status on social media, or it may be to elicit fraudulent online cash donations; faking back pain may allow an examinee to escape minor duties such as mowing the lawn but may also be aimed at obtaining disability payments.

The question of what can be defined as an external incentive will be fairly straightforward in most cases and more challenging in others. However, the incentive must be one that would be perceived by most people as increasing the likelihood of external gain or of escaping an undesirable outcome. The list provided in the model is not designed to be prescriptive or exhaustive but rather to provide common types of external incentives. More discussion of internal versus external incentives is also provided later in this paper under exclusionary criteria (Criterion B).

Invalid Presentation on Examination (Criterion B)

The original MND Criterion B, evidence from neuropsychological testing, included six different elements that could contribute to the determination of MND. The original Criterion C, evidence based on self-report, included an additional five elements, for a total of 11 different elements to consider in making a determination of malingering. Both Criterion B and C included a variety of different kinds of evidence: some criteria reflected evidence based on test data, whereas others included discrepancies between different sources of information outside of assessment data, contributing to a cumbersome and at times redundant decision tree. In the new model, evidence from the neuropsychological examination (Criterion B) is considered conceptually separate from evidence based on other sources of evidence outside of the assessment (i.e., natural history and pathogenesis of the condition in question, records and other media, and collateral informant report), which are now defined under Criterion C, Marked Discrepancies, reviewed later in this paper. Evidence from the examination is now more clearly defined as reflecting a form of invalid presentation indicative of feigning or exaggeration (Criterion B), a category that also includes compelling inconsistencies, a critical omission of the original MND model.

In the new model, evidence supportive of invalid presentation on examination is grouped according to symptom type: cognitive, somatic, psychiatric, or mixed symptom presentation. Under each of these symptom subtypes, an invalid presentation indicative of feigning or exaggeration (Criterion B) is defined as evidence during the examination of either (a) compelling inconsistencies indicative of deliberate exaggeration or feigning of deficits or symptoms, or (b) psychometric evidence of exaggeration or feigning of deficits or symptoms based on either PVTs or SVTs.

Evidence Based on Compelling Inconsistencies (Criteria B1a, B2a, and B3a)

The original MND criteria did not adequately address an important category of evidence in its original criteria, that is, the compelling inconsistencies that were identified and defined by Bianchini and colleagues in their criteria for malingering of pain-related disability (Bianchini, Greve, & Glynn, 2005). Compelling inconsistencies were introduced in a subsequent revision of the MND criteria (Slick & Sherman, 2013) but were not clearly defined. As per Bianchini, Greve, & Glynn (2005), compelling inconsistencies occur when “the difference in the way a patient presents when being evaluated compared with when they are not aware of being evaluated is such that it is not reasonable to believe the patient is not purposefully controlling the difference” (p. 408). In the new malingering model, compelling inconsistencies are discrepancies that are directly observed by the examiner during the evaluation, rather than compelling inconsistencies that are recorded by third parties or that are evident in records or other media. Compelling inconsistencies that are documented in written, audio, video, or electronic form such as social media are covered by Criterion C (Marked Discrepancies) because they form part of the records or documentation for the case rather than part of the direct examination of the patient. Compelling inconsistencies, along with PVT and SVT results, form part of Criterion B (Invalid Presentation on Examination Indicative of Feigning or Exaggeration). Compelling inconsistencies may be observed during the examination including during the clinical interview, testing, or at other times during the evaluation such as in the waiting room, interacting with others, or while on testing breaks. Thus, as defined in the model, compelling inconsistencies as evidence of invalid presentation allows malingering to be identified even when there is no test data at all (e.g., when evidence is limited to observations and clinical interview), a limitation of the prior MND model.

In the new model, compelling inconsistencies are instances of feigning or exaggeration of neurocognitive, somatic, or psychiatric dysfunction that are directly documented by the examiner, as opposed to being detected by PVTs or SVTs or found in records and documentation. Examples of compelling inconsistencies are the demonstration of a disputed capacity when the examinee thinks he or she is unobserved, such as an examinee stuttering throughout a clinical interview after a minor concussion but later being observed to speak normally to the office receptionist and on their cellphone, or implausible inconsistencies evident during the examination, such as an examinee describing their medical history, medical diagnoses, pain medications, and pain symptoms in great detail but who is then vague and evasive regarding prior mental health diagnoses and medications, the examinee who reports severe and incapacitating memory problems but who describes memory lapses in extreme and lengthy detail, or the examinee who selectively denies or omits critical information indicative of a known prior condition or distorts prior work or academic history even when repeatedly questioned. Compelling inconsistencies are not the typical, milder discrepancies seen in neuropsychological assessment, such as the examinee who reports word-finding problems yet speaks relatively normally during the interview. Rather, these are stark contradictions found either on observation or clinical interview that are so extreme or improbable that deliberate dissimulation, exaggeration, or feigning is determined to be the most reasonable cause. Other examples are the examinee reporting catastrophic cognitive deficits who drives independently to and arrives on time for an appointment in a busy, unfamiliar location and is noted to be well groomed and articulate, or the examinee complaining of severely slowed processing speed and crippling visual problems after a minor motor vehicle collision who is able to expertly use electronic devices to show pictures of a crash scene and of news articles involving the collision to the examiner.

Importantly, compelling inconsistencies are not definitive evidence of malingering but rather of feigning or exaggeration. Malingering requires meeting additional criteria, including the presence of an external incentive and consideration of exclusionary criteria and of other conditions that can co-occur with malingering but that may better explain the feigning or exaggeration, for example, “unconscious” feigning/exaggeration in somatic symptom disorder or deliberate feigning/exaggeration in factitious disorder.

Evidence Based on PVTs (Criterion B1b)

PVTs are tests designed to detect invalid cognitive performance. Most PVTs are designed to identify scores that are not credible by virtue of being too low to be believable; that is, they identify scores that are indicative of exaggeration of cognitive problems to an extent that cannot be attributable to a bona fide cognitive, neurological, medical, or psychological condition either due to their statistical improbability based on binomial probability theory or to their clinical improbability based on studies of clinical groups, experimental malingerers, and verified malingerers. PVTs are not “malingering tests”; the determination of malingering depends on meeting accepted, multidimensional malingering criteria that encompass not only PVTs but also external incentives and the totality of evidence available (i.e., observational, documentary, informant-based).

Although the state of the science at that time was relatively limited, the original MND criteria did not clearly define what kind of PVTs or neuropsychological tests could be used other than “forced-choice tests”; the criteria also used vague wording to refer to PVT data such as “evidence from neuropsychological testing” and evidence indicative of “response bias.” Although the criteria mentioned that tests should be well validated, there was no mention of how this should be defined or operationalized. In the revised criteria, this wording has been replaced by explicitly defined criteria that reflect current standards for using PVTs in malingering detection. Most importantly, the revised criteria operationalize the definition of a validated PVT and attempt to address the complex issue of PVT false positives with consideration of the number of PVTs administered, the issue of collinearity among PVTs, and the larger issue of the omnibus false-positive rate, critical concepts now known to be important dimensions of PVT interpretation that were not included in prior malingering models and which are discussed later in this paper.

A related point concerns the definition of PVT failure in prior malingering models. As already noted, the 1999 psychometric criteria for Definite MND was defined by the presence of below-chance performance “on a forced-choice test.” Much of the research at that time relied on binomial probability theory for identifying exaggeration on cognitive tests; the older conceptualization of noncredible performance based on binomial probability theory can still be seen in some test manuals published in that time period. For example, the Victoria Symptom Validity Test (VSVT; Slick, Hopp, Strauss, & Thompson, 1997) defines significantly below-chance performance as “Invalid,” chance-level performance as “Questionable,” and above-chance performance as “Valid” (Slick, Hopp, Strauss, & Thompson, 1997). As research has progressed, it has become clear that there are other ways of identifying noncredible performance with a very high degree of certainty other than significantly below-chance performance on forced-choice tests. We also now know that cutoffs ranging into the “Valid” range based on binomial probability are actually much more effective at detecting the greatest proportion of malingering examinees on forced-choice tests because only a minority of malingerers produce significantly below-chance or even chance performance (e.g., Jones, 2013). Thus, most modern forced-choice PVTs now define failure using specific empirically derived cutoffs with known sensitivity and specificity, not on cutoffs based solely on binomial probability theory. In addition, numerous PVTs that use

methods other than the forced-choice procedure now exist, either as stand-alone tests or embedded within existing neuropsychological tests. The new model incorporates these psychometric advancements in the wording and overall approach to PVT criteria.

In the new model, evidence of invalid cognitive presentation based on PVTs is now clearly defined as psychometric evidence of invalid cognitive test performance using PVTs that alone or in combination have a low false-positive rate (i.e., .10). Specifically, it is recommended that clinicians use (a) PVTs with an acceptable false-positive rate, (b) PVTs that provide non-redundant information, and (c) PVTs that have cutoffs that have been validated in clinical studies (i.e., known-groups design).

PVT false-positive rates/specificities. The revised criteria now specifically require that PVTs have an acceptable false-positive rate. It has often been recommended that individual PVTs should have empirically derived cutoffs set at a false-positive rate of 10% or lower, that is, at a specificity of .90, meaning that 90% of credible examinees score above the cutoff and pass the PVT (Babikian, Boone, Lu, & Arnold, 2006; Binder, Larrabee, & Millis, 2014; Boone, 2011; Larrabee, 2008, 2012a, 2014). This protects credible patients albeit at the expense of not identifying all malingerers. The field's focus on optimizing specificity rather than sensitivity occurs because making erroneous determinations of malingering (i.e., false positives) is generally considered to be more harmful to the individual than missing the detection of some malingerers (i.e., false negatives). Notably, sensitivity and specificity are not immutable values; examiners should be cognizant that sensitivity and specificity may vary depending on the context of testing, the type of examinee, and the setting in which examinees are seen.

Alternatively, instead of requiring that each separate PVT have a specificity of .90, one can require an acceptable overall or omnibus specificity (e.g., .90) regardless of the number of PVTs administered. Specifying an omnibus specificity is possible with the Advanced Clinical Solutions (ACS) portfolio of PVTs; for example, when one selects a 10% omnibus false-positive rate on the ACS, two or more low PVT scores would be required to indicate invalid performance in most clinical groups (Pearson, 2009), an estimate that fits well with the general malingering research. Omnibus false-positive rates are often not available in the published literature for combinations of PVTs, so it is reasonable to apply a false-positive rate of .10 to individual PVTs when using PVTs in combination.

Number of PVT failures required. The probability of confidently determining malingering is enhanced by requiring multiple PVT failures because this protects against false-positive diagnostic errors (Boone, 2013). Further, as discussed later in this paper, the sensitivity of individual PVTs is not always ideal, and so using multiple PVTs increases the likelihood that malingering examinees will be successfully detected. In addition, Boone has emphasized the need to sample validity throughout the examination because feigning may be domain-specific; for example, administering only one or two memory PVTs may miss other types of feigning. In addition, test engagement and valid responding may fluctuate across the examination, with examinees at times "picking and choosing" on which tests to perform poorly, requiring continuous sampling of valid responding throughout the neuropsychological assessment (Boone, 2013).

Thus, there are multiple reasons for administering multiple PVTs: requiring failure on multiple instead of a single PVT reduces the overall false-positive rate for malingering (i.e., increases specificity); administering multiple PVTs also increases overall malingering detection because individual PVTs are typically only moderately sensitive to malingering and allows validity to be sampled throughout the examination. Consequently, as more neuropsychologists realize the value of incorporating more PVTs in their evaluation, the use of multiple PVTs is becoming the norm in neuropsychology. As of 2015, surveys indicate that neuropsychologists, on average, administer four to six PVTs in total (i.e., three to four embedded PVTs and one to two stand-alone PVTs in each evaluation; Martin, Schroeder, & Odland, 2015). Within Veterans Affairs health settings, neuropsychologists report using five to eight PVTs (Hirst et al., 2017), and when performance validity is assessed, 89% of neuropsychologists employ at least two PVTs (Young, Roper, & Arentsen, 2016). Surveys of experts in neuropsychological validity testing also indicate an average number of eight PVTs in forensic neuropsychological evaluations (Schroeder, Martin, & Odland, 2016).

The increase in PVT use has nevertheless raised an important question: does administering multiple PVTs raise the risk of false positives? This question has generated significant controversy in the field (e.g., Berthelson, Mulchan, Odland, Miller, & Mittenberg, 2013; Bilder, Sugar, & Hellemann, 2014; Silk-Eglit, Stenclik, Miele, Lynch, & McCaffrey, 2015) and is increasingly relevant when the number of possible PVT scores may be as high as a dozen or more per comprehensive evaluation when both stand-alone and embedded PVTs are considered.

Our revised criteria eliminate the use of failure on a single PVT as psychometric evidence of malingering (excluding significantly below-chance performance). As Victor and colleagues have noted and others later confirmed, failure on a single PVT is not unusual in non-malingering examinees when multiple PVTs are administered, but failure on two or more PVTs (out

of four to nine PVTs) occurs rarely in non-malingering examinees (Meyers & Volbrecht, 2003; Victor, Boone, Serpa, Buehler, & Ziegler, 2009). Specifically, in studies that have combined PVT scores that each have acceptable false-positive rates, failure on two PVT scores is associated with a low overall rate of false positives (e.g., specificities of .90 and higher); failure on three PVT scores is associated with an essentially nil chance of false positives when tests with acceptable error rates are employed, with specificities as high as .99–1.00 (Larrabee, 2003b, 2012a; Meyers & Volbrecht, 2003; Victor, Boone, Serpa, Buehler, & Ziegler, 2009). Further, when independent tests with a false-positive rate of .10 are combined, failure on two PVT scores is associated with a false-positive rate of .01, and three failed PVT scores has a false-positive rate as low as .001 (Boone & Lu, 2003). Larrabee notes that failure on three PVTs is therefore associated with essentially no false-positive errors and presents “a highly compelling empirically-based conclusion in the context of any form of diagnostic testing” (p. 628, Larrabee, 2012a). On the balance, there appears to be compelling evidence that failure on two PVTs maintains an acceptable false-positive rate when four to eight PVT scores are considered (Larrabee, 2008, 2012, 2014; Victor, Boone, Serpa, Buehler, & Ziegler, 2009; see also Davis & Millis, 2014a, 2014b).

Thus, it is more appropriate to consider the ratio of PVT failures to total PVT scores rather than the absolute number of PVTs administered (Bianchini, personal communication, July 2019) with the assumption that most neuropsychologists will administer multiple PVTs in the neuropsychological evaluation to appropriately rule in/rule out malingering and to adequately sample validity throughout the assessment. For example, failing two of seven PVT scores would appear to meet criteria for invalid responding, as would failing four of 14 PVT scores; failing two of 14 PVT scores likely would not (i.e., because this would be equivalent to failing one out of seven PVTs). Using only one PVT score in the decision-making process for determining the presence of malingering would be considered insufficient unless that score indicates significantly below-chance performance; neuropsychological evaluations that contain no PVTs at all would not meet acceptable testing standards.

There is a compelling argument that scores that yield 100% specificity in known groups, that is, PVT scores that exceed all known scores from people in clinical groups (i.e., a score associated with 100% specificity that exceeds the cumulative distribution of scores of examinees with clinical conditions) would also be sufficient evidence of invalid responding so that only one such failed PVT would be required. Depending on the particular PVT, there may be sufficiently solid evidence for basing a determination of invalid presentation under Criterion B on a single PVT (e.g., Criterion B1b). However, unlike below-chance scores on forced-choice tests, scores in the range of 100% specificity do not demonstrate that the examinee deliberately chose wrong answers (i.e., and by inference, do not demonstrate a deliberate intent to appear cognitively impaired) even though scores in this range comprise very strong evidence of invalid performance. Therefore, although a score with 100% specificity in known clinical groups would indeed provide strong evidence of exaggeration and invalid test results, a single score in this range would be insufficient for meeting the PVT failure criterion in the model. Future malingering models will likely include scores with 100% specificity as important predictors, possibly once models using multivariate prediction of invalid performance using regression and/or weighting of different PVTs according to their efficacy at detecting invalid performance are further developed. However, these and other potentially more precise techniques of combining PVTs await further validation.

In sum, although the field still requires some refinement and validation on the optimal ratio of failed to administered PVTs required for the detection of invalid responding, we propose the following general recommendations: (a) select individual tests with specificities of .90 or above, (b) administer at least two or three but ideally multiple PVTs, (c) if only a relatively small number of PVTs are administered, use a criterion of at least two or more PVT failures as indicative of invalid performance, and (d) as the number of PVTs administered increases, monitor the ratio of PVT score failures to the number of PVT scores administered to best determine invalid responding. For example, if seven PVTs are administered, failure on two PVTs would indicate invalid responding, but as more and more PVTs are administered, the criterion should move to a higher number of failed PVT scores to support invalid responding. An alternative is to ensure an adequate omnibus false-positive rate. That is, the number of PVTs administered and the specificities of the PVTs should be precisely determined to yield, in combination, a low false-positive rate.

Redundancy in PVTs. The original MND criteria did not address the issue of redundancy in PVTs or how this could affect the determination of malingering. That is, when two highly intercorrelated PVTs with similar content or format are administered, the information they provide may be redundant and not contribute to providing additional evidence of invalid responding (Boone, 2013). Derived scores from the same PVT will necessarily include shared variance if these are based on the same items, such as the use of consistency scores, ratio scores, and immediate/delayed trials. If these are treated as independent PVT scores, this introduces redundancy. For example, the three main Effort scores from the Word Memory Test (Green, 2003) would not constitute independent PVTs because of high shared variance including both shared response format and administration format. Similarly, immediate and delayed trials of the same PVT, such as the TOMM (Tombaugh, 1996), would also not be considered independent PVTs for demonstrating failure on more than one PVT (but see also Binder, Larrabee, & Millis, 2014).

PVTs demonstrate a range of correlations with each other; one meta-analysis of 18 studies yielded a moderate intercorrelation of .31 for over 30 different PVTs in over 3,500 examinees (Berthelson, Mulchan, Odland, Miller, & Mittenberg, 2013), but some PVTs are highly correlated (e.g., TOMM and WMT; Heyanka et al., 2015; Merten, Bossink, & Schmand, 2007). Thus, it is unrealistic to require different PVTs to be uncorrelated, but neither should they demonstrate exceedingly high intercorrelations. To reduce the collinearity of PVTs, the general recommendation by Boone (2013) that a neuropsychological battery include PVTs covering more than one cognitive domain—and not just memory, as most do—is a reasonable approach, although it may introduce other complexities, most notably the fact that the classification accuracy statistics of memory-based PVTs tend to be better than those of PVTs that tap other domains (Burton, Vilar-López, & Puente, 2012; Marshall et al., 2010; Whitney, Shepard, & Davis, 2013).

In the revised criteria, it is specified that PVTs not be redundant. The field does not yet have clear guidelines on what the degree of maximal shared variance between two PVTs should be, but we would propose that PVTs that tap the same item pool or consist of derived scores from the same items would not be considered independent.

PVT validation and clinical (known-group) studies. One important aspect of the validation of PVTs is that they be used in clinical research involving individuals with clinical conditions and in verified malingerers. Although many PVTs have been used in studies involving simulation paradigms (e.g., healthy volunteers or clinical volunteers instructed to feign or exaggerate deficits), simulation studies tend to yield cutoffs that over-inflate sensitivity and underestimate the rate of false positives in clinical groups. Although useful in test development, simulation studies are considered only one of the multiple steps needed for test validation, and the cutoffs derived from them should be considered as provisional, needing replication in actual clinical settings. Therefore, PVTs used for the high-stakes determination of malingering should be validated in clinical groups, and their validation evidence should not be restricted only to simulation studies. Additionally, PVTs used in the determination of malingering should have research demonstrating their sensitivity to malingering as defined by clinical standards (i.e., sensitivity to malingering in malingering examinees identified through multidimensional malingering criteria) and not based only on concordance with other PVTs. Neuropsychological research in general should move away from defining “malingering” as failure on PVTs, a criterion that continues to be used as the sole validation standard for some PVTs cutoffs.

Other classification accuracy statistics. The new multidimensional criteria address standards for specificity of PVTs, but do not require standards for sensitivity. Sensitivity is assumed in test selection; that is, clinicians usually employ measures with at least moderate sensitivity to the domain they are measuring, whether it is intelligence, memory, or performance validity. Generally speaking, at a given acceptable specificity (false-positive rate) for a specific cutoff, the test with the best sensitivity (and best positive predictive value) is preferred, particularly given the legal standard of “more likely than not” which is satisfied if a positive predictive value of .51 or greater is obtained at a base rate that matches that of the setting in which the examinee was seen (Greve, Bianchini, Love, Brennan, & Heinly, 2006). PVTs usually identify only half to two-thirds of feigning examinees when scores with acceptable specificities are used (Boone, 2013; Sherman, Tan, & Hrabok, in press). As already noted, when PVT cutoffs are calibrated based on having a low false-positive rate (i.e., an acceptable specificity rate), the false-negative rate will increase (i.e., more malingering examinees will be missed by the more stringent cutoff). Nevertheless, a general finding, which some have termed the “Larrabee Limit” (Erdodi, Kirsch, Lajiness-O’Neill, Vingilis, & Medoff, 2014), is that when specificity is held at an acceptable .90, PVTs tend to have sensitivities of .50 (Larrabee, 2012b), and this is likely an acceptable benchmark for PVT sensitivity (see also Vickery, Berry, Inman, Harris, & Orey, 2001, who also reported average sensitivities of .56). Thus, as already noted, because most PVTs are only moderately sensitive (i.e., do not detect most malingering cases), sensitivity will increase as more PVTs are administered, providing more impetus for administering multiple PVTs during the neuropsychological examination.

The sensitivity of some embedded PVTs tends to be lower than that of stand-alone PVTs (e.g., Armistead-Jehle & Hansen, 2011; Gualtieri & Hervey, 2015) although there are exceptions (e.g., Moore & Donders, 2004), at least with the current generation of embedded PVTs—that is, embedded PVTs derived a posteriori, rather than planned a priori during test development. Thus, based on the current state of research, along with the guideline for administering multiple PVTs, it makes sense to ensure that at least some of these PVTs are stand-alone PVTs. When this cannot be done, for example, if testing is discontinued before completion or the time window available for testing is too brief (e.g., inpatient evaluations), in these and other situations, embedded PVTs can be of utility in addition to the fact that they are cost-effective, inconspicuous, and can be used even in abbreviated batteries (Erdodi, Kirsch, Lajiness-O’Neill, Vingilis, & Medoff, 2014; Erdodi & Lichtenstein, 2017).

Other classification accuracy statistics such as high posterior probabilities were considered in previous attempts at revising the MND criteria (e.g., Slick & Sherman, 2013). However, realistically, most clinicians do not have easy access to these or other

sophisticated classification accuracy statistics for PVTs because these statistics are not yet routinely included in manuals or in malingering research. Although these would be desirable for future criteria revisions, the routine inclusion in research papers of positive predictive values, negative predictive values, likelihood ratios, posterior probabilities, and other classification accuracy statistics has not yet permeated the field. However, most test manuals and malingering research studies do provide information on specificity (and sensitivity) values, which is why they are emphasized here.

Evidence Based on SVTs

SVTs are scales that are designed to assess the validity of self-reported symptoms; these are typically embedded in comprehensive standardized self-report questionnaires and, less often, are available as stand-alone scales or structured interviews. SVTs flag self-reported symptoms indicative of distortion of symptoms (i.e., over-reporting, implausible reporting, inconsistent reporting, or under-reporting). The methods by which SVTs detect invalid symptom report vary across tests. SVTs relevant to malingering detection identify scores that are indicative of exaggeration of cognitive, somatic (e.g., neurological, medical), or psychological symptoms. Most are designed to identify symptoms that are not credible by virtue of being overly exaggerated, too negative, or too implausible to be believable.

For the purposes of malingering detection, validity scales that measure under-reporting or inconsistent reporting (e.g., random reporting) of symptoms would not, in isolation, usually be considered evidence of malingering because these do not directly assess exaggerated or feigned cognitive, somatic, or psychiatric symptoms, although there is research indicating that some SVTs that measure inconsistency may show promise in this regard (Gervais et al., 2018; Gu, Reddy, Green, Belfi, & Einzig, 2017). Additionally, although inconsistent reporting may reflect an attempt to appear impaired, it may also reflect other factors (e.g., uncooperativeness, cognitive deficit, low literacy levels). Thus, for purposes of malingering detection and because research on other kinds of SVTs is not yet as strong, the recommendation is that only SVTs tapping over-reporting be used in the new multidimensional malingering criteria. Practically speaking, when interpreting over-reporting SVTs, one must nevertheless make sure that SVTs that measure inconsistent reporting are not elevated because random item selection may artificially inflate SVTs measuring over-reporting of symptoms (e.g., Greene, 2008; Sellbom & Wygant, 2018).

SVTs and Construct Contamination

The new criteria address several problems of the MND model with regard to SVTs, including a lack of clarity on how to use self-report scales in identifying malingering and problematic criteria that allowed for non-cognitive (e.g., psychiatric) self-report measures to be used to define cognitive malingering. In addition, the MND criteria did not allow the identification of malingering in situations where only SVTs were available, a criticism of the original MND framework as relying disproportionately on PVT evidence (Larrabee, 2005).

First, the MND criteria were unclear as to what kinds of self-reported scales could be used in detection of MND, providing no specific instruction as to whether “measures of psychological adjustment,” the term used in the criteria, referred to actual SVTs, general measures of psychopathology, or any scale measuring self-reported symptoms. Second, the MND model allowed for any kind of self-reported symptoms to contribute to the determination of cognitive malingering, potentially confounding different types of malingering. For example, Criterion C5 included self-reported evidence of “exaggerated or fabricated psychological dysfunction or distress” on measures of psychological adjustment to support the determination of MND, even though MND refers to cognitive malingering, not exaggerated or feigned psychiatric symptoms.

In hindsight, the MND diagnostic criteria clearly lacked construct clarity with regard to self-report measures. At the time, there were a limited number of SVTs in clinical usage, and the research on cognitive malingering prediction using SVTs was sparse. Existing SVTs at the time mainly consisted of psychiatric over-reporting scales from the Minnesota Multiphasic Personality Inventory-2 (MMPI-2; Butcher et al., 2001) such as F and Fp that were assumed to predict the general construct of malingering captured by MND, and the Structured Interview of Reported Symptoms (SIRS; Rogers, 1992), a semi-structured interview (Rogers, 2018a) that was not well known within neuropsychology and that to our knowledge had never been used in neuropsychological research. SVTs at the time also included relatively nascent scales developed specifically for neuropsychology such as the MMPI-2 Fake Bad Scale (FBS; Lees-Haley, English, & Glenn, 1991, later renamed the Symptom Validity Scale), validated on a loosely defined definition of malingering in litigants and containing a variety of items measuring cognitive, psychiatric, and somatic symptoms. The MMPI-2 Response Bias Scale (RBS) was developed later, in 2007, also from existing MMPI-2 items but this time with items empirically selected based on the ability to predict the likelihood of failure on a single PVT in litigants and disability claimants seen for neuropsychological assessment (Gervais, Ben-Porath, Wygant, & Green, 2007). This also led to an SVT that contained a variety of items measuring cognitive, somatic, and psychiatric symptoms.

Research since the publication of the MND criteria clearly indicates that psychiatric over-reporting scales such as the F-family of scales from the MMPI-2 (i.e., F, Fb, and Fp-r) are not highly predictive of cognitive malingering in most examinees compared to SVTs such as FBS or RBS, likely because psychiatric over-reporting scales do not tap the somatic and cognitive symptom presentations that tend to occur with MND (Boone, 2013). In contrast, the most commonly used SVTs in neuropsychology, FBS/FBS-r and RBS from the MMPI-2 and Minnesota Multiphasic Personality Inventory-2 Restructured Form (MMPI-2-RF; Ben-Porath & Tellegen, 2008), have demonstrated efficacy at detecting MND as per the 1999 criteria in a variety of clinical groups including litigants, disability claimants, and military personnel. Table 2 shows over a dozen studies that have used the MND criteria as the standard for determining empirically based SVT cutoffs, with many cutoffs having specificities of .90 or greater for detecting MND.

However, these SVTs tap multiple symptom types and are thus also potentially affected by lack of construct unity and clarity. For example, both FBS and RBS contain a mix of mostly somatic and psychiatric items along with some cognitive items. The MMPI-2 FBS contains only two items directly tapping cognition among its 43 items yet has been used in multiple studies to support a determination of MND, a condition that at least in theory should primarily reflect cognitive malingering, not somatic or psychiatric malingering. The RBS has nine cognitive items among its 28 items, the rest consisting of somatic or psychiatric items; compared to FBS, RBS therefore includes more cognitive items but despite this, the RBS is only slightly more sensitive to MND in some studies (Bianchini et al., 2018; Peck et al., 2013; Tarescavage, Wygant, Gervais, & Ben-Porath, 2013), and in others, it is marginally less sensitive to MND (Dionysus, Denney, & Halfaker, 2011; Jones, 2016). Nevertheless, studies on mixed scales such as FBS and RBS indicate that these SVTs have been used in the determination of MND in a number of patient groups.

However, that an SVT is able to predict the likelihood of MND does not mean that it specifically measures cognitive malingering. Multi-domain SVTs predict MND with low to moderate sensitivity because cognitive malingering tends to co-occur with somatic malingering and psychological malingering in most populations studied by neuropsychologists, most specifically litigants and disability claimants who tend to present with a mixed symptom picture of somatic, psychological, and cognitive symptoms. It is also theoretically possible that multi-domain SVTs like FBS and RBS are predictive of MND because of the very fact that the original MND criteria did not differentiate between cognitive, somatic, and psychiatric SVT failure in its criteria in the first place, introducing some circular logic in the notion that if an SVT predicts MND, it must be sensitive to cognitive malingering.

Regardless, lack of clarity of criteria relating to cognitive, somatic, and psychiatric SVTs in the determination of MND combined with mixed content in SVTs contributes to lack of advancement in our understanding of malingering and lack of precision in our diagnostic categories. This is problematic in terms of construct validity but also, clinically, in terms of correctly identifying the type of malingering found in individual examinees, particularly in high-stakes, compensable situations such as personal injury litigation or disability evaluations where it is critical to be able to differentiate between cognitive, somatic, and psychological injuries. For instance, it is certainly possible for an examinee to significantly exaggerate chronic neck and back pain after a workplace injury but to have genuine PTSD symptoms, and to receive workers' compensation based on the latter but not the former claimed symptoms. A malingering model that places all symptoms under a single rubric of malingering will limit important distinctions in the neuropsychological profile of persons who may exaggerate one symptom type but not another.

To increase construct clarity and decrease confusion, the new multidimensional criteria therefore classify the different kinds of self-reported symptoms according to whether they reflect cognitive, somatic, or psychiatric malingering and clearly define how SVTs should be used to make the determination of malingering. Thus, ideally, cognitive SVTs should be used to detect cognitive malingering, somatic SVTs should be used to detect somatic malingering, and psychiatric SVTs to detect psychiatric malingering. A separate category is provided for examinees who present with evidence of invalid SVT results across domains or on multi-domain SVTs.

One obvious practical limitation to this approach is that there still exist very few validated SVTs that exclusively measure one type of symptom exaggeration. Multi-domain SVTs from the MMPI-2 and MMPI-2-RF such as FBS/FBS-r and RBS are currently the most frequently used SVTs to detect cognitive malingering in the neuropsychological evaluation; they have also been used to detect MPRD in patients with chronic pain as well as psychiatric malingering in claimants with disability (Bianchini et al., 2018; Chmielewski, Zhu, Burchett, Bury, & Bagby, 2017; Table 2). Other mixed symptom SVTs include the Validity-10 from the Neurobehavioral Symptom Inventory (NSI), a concussion scale, with two cognitive items out of its 10 items (Lange, Brickell, Lipka, & French, 2015), and the Mild Brain Injury Atypical Scale (mBIAS), an SVT intended to detect feigned traumatic brain injury with items including both cognitive and PTSD symptoms, originally designed for military populations (Lange, Edmed, Sullivan, French, & Cooper, 2013).

Nevertheless, there do exist a small number of scales that appear promising as single-domain SVTs, although every scale mentioned here needs more validation research as of this writing. The MMPI-2-RF's Cognitive Complaints (COG) content scale is an existing content scale which some studies indicate has potential as a cognition SVT (Wygant et al., 2011). Similarly,

the Cognitive Complaints Scale (CCS) is a promising scale that consists of 13 items comprised only of cognitive items from the MMPI-2; it shares few items with FBS and RBS (Henry, Heilbronner, Mittenberg, Hellemann, & Myers, 2014). Similarly, studies suggest that the Memory Complaints Inventory (MCI; Green, 2004), a self-report questionnaire on memory problems, may be well suited to the detection of exaggeration of cognitive complaints (Armistead-Jehle, Gervais, & Green, 2012a, 2012b). The Structured Inventory of Malingered Symptomatology (SIMS), a stand-alone SVT, does have some cognitive malingered subscales, the Amnesic Disorders and Low Intelligence subscales, but only the overall score combining cognitive, neurological, and psychiatric symptom over-reporting has been validated against malingered criteria as of this writing (Sherman, Tan, & Hrabok, *in press*; Wisdom, Callahan, & Shaw, 2010). Likewise, the Structured Interview of Reported Symptoms, Second Edition (SIRS-2; Rogers, Sewell, & Gillard, 2010), primarily a scale of psychiatric over-reporting, includes a cognitive subscale, but to our knowledge its ability to predict cognitive malingered has yet to be demonstrated. Other comprehensive standardized scales such as the Personality Assessment Inventory (PAI) may appear to contain SVTs relevant to cognitive malingered, but its main SVTs (i.e., Negative Impression Management scale [NIM], Rogers Discriminant Function scale [RDF]) include mostly psychiatric items. Note that recent efforts to develop cognitive SVTs for the PAI appear promising but require further validation; these tap a variety of items and not just cognitive items. This includes the Cognitive Bias Scale (CBS), an SVT whose items were chosen as good predictors of failure on two PVTs (Gaasedelen, Whiteside, Altmaier, Welch, & Basso, 2019), and the Feigned Adult ADHD Index, an SVT whose items were selected based on their ability to identify feigned ADHD (Aita, Sofko, Hill, Musso, & Boettcher, 2018).

Among scales tapping somatic exaggeration, the MMPI-2-RF Fs scale is an SVT created specifically for detecting over-reporting of somatic symptoms and has been used in MND detection (Table 2). There are also a small number of SVTs derived from stand-alone self-report pain inventories such as the Pain Disability Index and stand-alone scales such as the Modified Somatic Perception Questionnaire that have proven useful in the detection of somatic malingered (Balasanyan et al., 2018; Bianchini et al., 2014; Crighton, Wygant, Applegate, Umlauf, & Granacher, 2014).

With regard to psychiatric exaggeration, apart from the well-known MMPI-2/MMPI-2-RF F-family of scales, there is the SIRS-2, a psychiatric SVT with a large body of supportive research; however, it may be challenging to administer in some settings due to its interview format and length. Other scales such as the Miller Forensic Assessment of Symptoms Test (M-FAST), a dedicated psychiatric malingered scale, can also be used to detect psychiatric over-reporting including claims of delayed PTSD, but it has produced mixed results in terms of detection of other kinds of symptom exaggeration (Smith, 2018). To date, there have been comparatively few validated PTSD SVTs despite the potential utility of these scales in personal injury, civil disability, and military disability settings. There are also SVTs designed for more extreme psychiatric symptomatology such as feigned schizophrenia and psychosis, more typically used and validated in forensic/criminal settings (M Test; Beaber et al., 1985; Smith, 2018).

In sum, since the MND criteria were published, it is now clear that the specific domain tapped by SVTs is important in identifying which kind of malingered is being detected. Overall, when considering the pool of available SVTs, the field would benefit from derivation of more clearly differentiated scales for the determination of separate dimensions of cognitive, somatic, and psychiatric over-reporting. Ideally, developing a conceptual model of malingered that can differentiate between the different manifestations of malingered (i.e., cognitive, somatic, psychiatric, and mixed) may help advance the validation and construct clarity of SVTs used to detect malingered, just as the original MND criteria helped bolster the development and refinement of PVTs.

SVT false-positive rates/specificities and sensitivities. The revised malingered model holds SVTs to the same standards as PVTs, now specifically requiring that an invalid SVT score be based on SVTs that (a) have an acceptable false-positive rate, (b) provide non-redundant information, and (c) have validated cutoffs using clinical (i.e., known-group) studies. This means that SVT cutoffs should have individual specificities of .90 and above for the detection of invalid scores. In general, with regard to sensitivity to cognitive malingered, if validated cutoffs are used, SVTs are unlikely to mislabel credible examinees as noncredible, but they may miss more malingered examinees than will stand-alone PVTs. Looking at studies that used MND as the criterion for malingered, all things being equal, SVTs tend to have lower sensitivity than stand-alone PVTs, although this also varies by study and clinical group, with some SVT sensitivities approaching those of some PVTs (see references listed in Tables 1 and 2).

Number of SVT failures required. With the exception of significantly below-chance responding, one PVT failure is insufficient for the determination of invalid performance based on PVTs in the new model; does this also mean that the presence of one SVT failure is insufficient for the determination of invalid self-reported symptoms based on SVTs? Compared to PVTs, there is very little research on the optimal number of SVTs that should be administered to properly detect malingered. In one study

that combined SVT scores, two failed SVTs out of five SVT scores appeared to provide maximum classification accuracy while maintaining optimal specificity (Tarescavage, Wygant, Gervais, & Ben-Porath, 2013).

However, PVTs and SVTs are quite different. PVTs measure a discrete sample of behavior captured in real time during the assessment, whereas SVTs are self-ratings of symptom severity that are rated as to their frequency in daily life (e.g., “Most of the time” or “Usually”), implying a frequency rating on a set of usual behaviors rather than a single instance of behavior, or rated as present or absent based on presumably stable characterological traits (e.g., “False, Not At All True,” or “Very True”). SVTs, in theory, thus sample a self-reported behavioral estimate based on multiple instances of the symptom being measured rather than on a single, brief, discrete sample of behavior, as do PVTs. Therefore, at least on theoretical grounds, one SVT failure could be deemed sufficient to determine the presence of invalid self-reported symptoms because it is based on a sufficiently large sample of self-reported behaviors—although this interpretation could be contested because SVTs capture exaggerated/implausible symptoms intentionally distorted by the examinee, not genuine symptoms whose frequency is presumably being accurately reported. As such, SVTs could also be interpreted as a single sample of behavior (i.e., an instance of either valid self-reporting or of invalid self-reporting).

Independent of this question, from the standpoint of adequate malingering detection, administering a single SVT may be insufficient to properly detect malingering because SVTs tend to be less sensitive to malingering than PVTs. Therefore, to adequately detect malingerers, more than one SVT should be administered to reduce the likelihood of false negatives, particularly if the goal is to rule in or rule out malingering across specific domains (i.e., cognitive, somatic, and psychiatric). On the other hand, logistically, administering multiple SVTs to capture every possible instance of exaggeration of self-reported symptoms may be difficult to do. Existing validated SVTs are already embedded in lengthy standardized questionnaires (e.g., MMPI-2-RF); adding more questionnaires to an already lengthy battery may not be realistic in some settings. In fact, some surveys indicate that when validity is assessed, neuropsychologists tend to administer only one “SVT” in their evaluation (Martin, Schroeder, & Odland, 2015), although this “one SVT” is actually a comprehensive questionnaire with multiple SVT scales that have sufficient coverage of cognitive, somatic, and psychiatric over-reporting (i.e., the MMPI-2-RF). Taking these points into consideration and in the absence of specific guidance from the research literature on the optimal number of SVTs to administer or on the optimal number of SVT failures required for the detection of malingering, although we recommend administering more than one SVT which could be accomplished by administering one psychological scale with more than one embedded SVT score, the new model requires only one SVT failure for invalid responding.

As already noted, below-chance PVT scores are the proverbial “smoking gun of intent.” However, there is no similarly convincing indicator of deliberate intent to deceive on SVTs. Clearly, failing an SVT with a score that exceeds all known clinical groups (i.e., a score associated with 100% specificity that exceed the cumulative distribution of scores of examinees with psychiatric or medical conditions) would strongly suggest invalid responding. However, obtaining scores in that range, unlike below-chance failure on PVTs, would not be an incontrovertible evidence of deliberately choosing wrong or false answers. Compellingly, there is some research indicating that there may be a continuum of exaggeration on SVTs such that somatic malingerers have more highly elevated SVT scores than examinees with somatoform disorders, who in turn have more highly elevated SVT scores than healthy examinees (Sellbom, Wygant, & Bagby, 2012). However, as of this writing, there exist, to our knowledge, no SVTs with validated, differential cutoffs that would allow a clear differentiation between somatic symptom presentations and conditions associated with deliberate deception (i.e., malingering and factitious disorder) that would be sufficiently rigorous and well validated to allow the differential diagnosis of deliberate versus “unconscious” over-reporting based on specific SVT cutoffs. In other words, although extreme scores on SVTs are certainly considered a strong evidence of an invalid presentation indicative of feigning or exaggeration (Criterion B), they are not, in and of themselves, sufficiently specific to indicate proof of intent to appear impaired insofar as can be concluded based on the current state of the literature on this question.

Redundancy in SVTs and SVT validation. As in PVT selection, consideration must be made to shared item content when choosing multiple SVT scores in the determination of malingering. For example, there are a number of shared items between well-known SVTs from the MMPI-2/MMPI-2-RF, most notably between FBS/FBS-r and RBS, and particularly between FBS/FBS-r and the Henry–Heilbronner Index (HHI/HHI-r), an SVT derived specifically to detect MND. Predictably, all three of these scales are highly intercorrelated, including FBS and RBS, which have moderate correlations in the normative sample but higher correlations in clinical groups (e.g., $r = 0.50–0.80$; Dionysus, Denney, & Halfaker, 2011; Grossi, Green, Einzig, & Belfi, 2017; Wygant et al., 2010; see also Sherman, Tan, & Hrabok, in press). Therefore, it is suggested that practitioners consider the issue of redundancy when selecting multiple SVT scores in evaluations and not treat SVTs with significant item overlap as if they were independent SVTs. As is the case for PVTs, a clinical decision on malingering should not be based on SVTs whose validation studies consist only of simulation studies, but instead should rest on SVTs with validation evidence in clinical groups (i.e., known-groups design).

Marked Discrepancies (Criterion C)

In the original MND criteria, discrepancies between different sources of information could be found under both Criteria B and C. The requirement for marked discrepancies is now a stand-alone criterion in the revised model due to the importance of discrepancies in malingering detection. This also reduces the likelihood that PVT and SVT results would unduly influence the determination of malingering, as was possible in the original MND criteria. That is, because discrepancies were mixed in with evidence from PVTs and SVTs, it was possible to make the determination of malingering in the absence of any discrepancies between test data and known patterns of brain functioning, documented background history, and reliable collateral informant—a clear weakness of the original criteria. Marked discrepancies between sources of evidence are a critical aspect of malingering and, when present, reduce the chances of false positives. Thus, in the revised criteria, at least one marked discrepancy is required for the determination of malingering, consistent with suggestions from experts in the field (Larrabee, 2005). Further, in the new model, discrepancies are rephrased and clarified as marked discrepancies to differentiate them from those that routinely occur in clinical evaluations due to normal and expected differences between different kinds of evidence such as differences between self- and informant ratings on standardized scales or between self-reported and measured cognitive abilities.

The original MND criteria had eight criteria referring to discrepancies, listed under either evidence from neuropsychological testing or evidence from self-report. These involved a variety of different kinds of discrepancies including those between test data, observations, documentation, and collateral informants. However, because discrepancies were listed under testing and self-report rubrics, a significant degree of redundancy and repetition was present. In addition, the self-report category was not clear because it included discrepancies between all kinds of self-report data but did not specify whether self-report discrepancies consisted of self-report on SVTs or self-report obtained in other ways, such as clinical interview. Further, this section from the original MND criteria included non-self-report evidence nevertheless classified under the rubric of self-reported symptoms (e.g., Criterion C4, referring to history or behavior being discrepant from collateral informant reports).

Thus, in the new model, it is explicitly specified that (a) discrepancies have to be between test data/symptom report and other kinds of evidence, and (b) the types of evidence consist of three clear categories, namely, (i) natural history and pathogenesis of the condition in question, (ii) records and other media, and (iii) reliable collateral informant report. In addition, a reliable collateral informant report is defined as one who does not have a vested interest in the outcome of the evaluation. This is because some informants by definition will also be subject to external incentives that consciously or unconsciously influence perceptions of the examinee, and this includes spouses, parents, relatives, friends, and in some cases, co-workers. To help with interpretation, clinical examples of marked discrepancies sufficient to meet Criterion C are shown in [Box 2](#). As with the external incentives (Criterion A), the examples provided are not designed to be prescriptive or exhaustive but rather to provide some clinical guidance on what situations could meet criteria for a marked discrepancy; in the future, with more research, marked discrepancies could be defined with more precision.

Box 2. Examples of Marked Discrepancies Between Test Data/Symptom Report and Other Sources of Evidence (Criterion C).

Discrepancies between test data/symptom report and the following:

1. Natural history and pathogenesis of the condition in question

An examinee performs in the severely impaired range on memory tests after a mild concussion.

An examinee recalls the details of a motor vehicle collision but claims anterograde amnesia for several months after the collision.

An examinee sustains a mild traumatic brain injury and claims a loss of autobiographical memory.

An examinee with alleged PTSD describes highly detailed, stereotypic, repetitive nightmares of increasing frequency beginning two years after a traumatic event.

An examinee in a criminal forensic setting reports hearing a single exaggerated/malevolent voice commanding them to perform a criminal act but has no other psychiatric symptoms such as other hallucinations, delusions, negative symptoms, or disorganized speech.

An examinee reports pain symptoms of sufficient severity to preclude work but routinely engages in recreational sports and social activities.

2. Records and other media

An examinee obtains severely impaired memory scores after a motor vehicle collision, but emergency, hospital, and family doctor records indicate no loss of consciousness or cognitive problems at the scene or subsequently.

An examinee reports pervasive and lengthy post-traumatic amnesia, but hospital records and nursing notes indicate full alertness, normal behavior, and no post-traumatic amnesia.

An examinee denies previous brain injury or psychiatric history yet has medical records that document prior personal injury litigation for brain injury and a long-standing history of mental health problems.

An A-student on academic scholarship undergoing baseline concussion testing obtains severely impaired scores in almost all domains tested.

An examinee who reports incapacitating neck pain interfering with activities of daily living after a minor collision is discovered to be a social media influencer with frequent posts documenting athletic accomplishments.

An examinee reports a permanent decline in GPA after concussion attributed to a motor vehicle collision, but review of school records reveals marginal grades in high school and academic probation in college courses both before and after the collision.

3. Reliable collateral informant report

An examinee is unable to perform simple math problems in testing but performs well as an accountant according to an employer.

A patient reports severe memory deficit impairing work performance but has above-average work performance according to a work supervisor.

An examinee reports excellent grades and no accommodations before an accident, but teacher questionnaires indicate severe learning issues.

A high school student reports a long-standing history of severe and impairing ADHD, but standardized questionnaires from a teacher who knows the student well indicate no ADHD-type problems.

Exclusionary Criteria (Criterion D)

The original MND model specified that MND could not be identified in the presence of certain developmental, neurological, and psychiatric conditions. However, these criteria were imprecise, reflecting the limited breadth of the literature at the time. Since then, many studies have provided important information on which conditions should be considered exclusions and at which level of severity. In the revised criteria, the exclusionary criteria are more clearly defined, including which developmental, neurological, and psychiatric conditions exclude malingering. Thus, moderate to severe dementia and moderate to severe intellectual disability (e.g., IQ < 60) are listed as exclusions for malingering, but mild dementia, mild intellectual disability, psychosis, and DSM-5 disorders involving somatic symptoms (e.g., somatic symptom disorder, conversion disorder/functional neurological symptom disorder, factitious disorder) are not considered exclusions because malingering can occur in each of these conditions. In the new criteria, moderate to severe dementia and severe intellectual disability are exclusions for malingering based on recommendations by Boone (2011) and on the work of several researchers who have significantly contributed to our understanding of PVT performance in intellectual disability (e.g., Chafetz & Biondolillo, 2012, 2013; Chafetz, Prentkowski, & Rao, 2011; Green & Flaro, 2015) and dementia (e.g., Dean, Victor, Boone, Philpott, & Hess, 2009; McGuire, Crawford, & Evans, 2018; Singhal, Green, Ashaye, Shankar, & Gill, 2009).

With regard to psychosis, in the original MND criteria, malingering could not be identified in the presence of psychosis even if the examinee met every other criterion. The differential diagnosis of genuine versus feigned psychosis is a frequent reason for referral in forensic psychiatric, criminal, and some clinical settings, and so it makes little sense to include psychosis as an exclusionary criterion. Psychiatric symptoms such as auditory hallucinations are relatively easy to feign and largely unverifiable because they rely only on self-report; as a result, feigned psychosis can be used to escape or mitigate criminal punishment or, in the clinical setting, to obtain disability income, medication, and access to services (Pierre, 2019). Malingering can certainly occur during genuine psychosis when an individual is highly motivated by an external incentive (e.g., feigning symptoms to escape a highly aversive situation such as the case described by Jaffe & Johnson, 2016). When evaluating PVT and SVT scores from individuals with psychosis or other kinds of severe psychiatric symptoms, examiners should be well informed in the assessment of feigned psychosis and use PVTs and SVTs with validated cutoffs in psychiatric groups.

As noted in the new model, psychiatric disorders such as somatic symptom disorder, conversion disorder/functional neurological symptom disorder, and factitious disorder are not exclusions for malingering. This is largely based on the

work of several experts in the field who have contributed significantly to our understanding that malingering can co-occur with somatoform disorders including somatic symptom disorder and factitious disorder (e.g., Bass & Wade, 2019; Boone, 2017; Ferrari & Klar, 2014; Larrabee, 2014; Merten & Merckelbach, 2013; Worley, Feldman, & Hamilton, 2009). There are important similarities and critical distinctions between somatic symptom disorder, conversion disorder, factitious disorder, and malingering, but none exclude co-occurrence. For example, all four conditions are associated with discrepancies between subjective complaints and objective signs (Merten & Merckelbach, 2013). However, although somatic symptom disorder, conversion disorder, and factitious disorder all involve exaggeration of symptoms motivated by internal incentives (i.e., non-material benefits from maintaining the sick role), only factitious disorder involves doing so via intentional deception; in somatic symptom and conversion disorder, this is assumed to occur unconsciously. In a similar fashion, factitious disorder and malingering both involve intentional deception, but the main difference is that factitious disorder involves intentionally deceiving in order to maintain the sick role, whereas malingering involves intentionally deceiving for external gain.

However, a person with somatic symptom disorder, conversion disorder, or factitious disorder can also be motivated by external gain to feign or exaggerate their symptoms in addition to being motivated by the sick role, in which case they are malingering in addition to having a somatoform condition. Patients who were initially somatoform but who later malingering because of external gain have been described in the literature and are familiar to forensic experts. There is no doubt that the sick role opens up opportunities for material gain that were not available previously to a person who has been injured or who has received certain medical diagnoses, and these gains are not available to healthy individuals; these include disability payments, workers' compensation, paid sick leave, home health care, housekeeping services, additional medical coverage, prescription drugs, accommodations at school, and of course, litigation damages (e.g., Worley, Feldman, & Hamilton, 2009).

Boone notes that “just because patients lack insight into the psychological genesis of some symptoms does not mean that they are not capable of deliberate misrepresentation of those or other symptoms when incentivized to do so” (p. 31; Boone, 2017). Merten and Merckelbach also note that there is no reason to believe that malingering occurs less frequently in somatoform disorders than in other psychiatric disorders such as depression or PTSD or that genuine psychiatric disorders cannot co-exist with malingering when external gains are at stake; they also note that somatoform conditions themselves can be feigned to obtain external gain (Merten & Merckelbach, 2013). Others note that for some plaintiffs who intentionally feign injury or psychological trauma, the occurrence of an index event such as a motor vehicle accident provides an important opportunity for a face-saving solution for long-standing or acute personal life crises unrelated to the index event (Ali, Jabeen, & Alam, 2015). Thus, “in a life of personal disarray, disharmony, and psychological turmoil, the individual takes this event as a convenient focus and as the solution to all their longstanding miseries and difficulties” (p. 154; Ferrari & Klar, 2014) and then engages in deliberate feigning or exaggeration to escape a difficult personal situation.

Further complicating matters, the demarcation between primary gain (the sick role) and secondary gain (monetary and material benefits) is not always clear cut because there is almost always some form of external gain present in maintaining the sick role. For example, the sick role has intangible benefits such as gaining attention, sympathy or admiration from others (e.g., one can be seen as an honorable veteran with PTSD or as a rare and puzzling medical case by prominent medical specialists), but it also inherently bestows tangible benefits such as a blame-free escape from social obligations and household duties, an escape from stressors, and a socially acceptable form of disability (Bass & Wade, 2019; Merten & Merckelbach, 2013; Worley, Feldman, & Hamilton, 2009) such that, as some have put it quite practically, one is allowed to “pass on dinner with the in-laws” (p. 2, Worley, Feldman, & Hamilton, 2009). These kinds of benefits would be sufficiently motivating for some examinees to warrant deliberately exaggerating symptoms and thus engaging in malingering.

Although these conditions have not been as well studied as others, studies suggest that it is the presence of secondary gain that causes PVT failure in somatoform conditions rather than primary gain. Regarding the role of PVTs, studies on a number of somatoform conditions such as medically unexplained symptoms, fibromyalgia, chronic fatigue syndrome, and functional neurological disorder indicate a relatively low rate of PVT failure unless there is a substantial external incentive such as disability benefits present (Brooks, Johnson-Greene, Lattie, & Ferece, 2012; Johnson-Greene, Brooks, & Ferece, 2013; Kemp et al., 2008; Teodoro, Edwards, & Isaacs, 2018). In contrast, there is a much higher rate of PVT failure in pain patients incentivized by external gain (e.g., Gervais et al., 2001; Greffenstein, Gervais, Baker, Artiola, & Smith, 2013). Thus, somatoform conditions are not in and of themselves associated with PVT failure; it is the presence of an external incentive such as disability payments that is (Ferrari, 2016).

Similarly, the assumption that PVT failure can be fully explained by depression, PTSD, other mental disorder, or factors such as fatigue, pain, or a cry for help is unsupported (Merten & Merckelbach, 2013). As noted by Merten and Merckelbach (2013), “it would make for an incoherent theoretical position if we were to assume that psychological complaints that produce minimal interference with everyday functioning produce failures on [PVTs] comparable to those of moderate or severe dementia or other conditions associated with serious cognitive impairment” (p. 137). In terms of SVT failure, “the medical or psychological expert witness should be cautious not to fall into the trap of explaining away SVT failure or other signs of uncooperativeness by

speculative psychological factors (such as a cry for help) unless there is clear and independent evidence that such factors serve as causal antecedents”; when PVT or SVT failure occurs in the presence of an identifiable external incentive, “malingering will be the primary conclusion” (p. 133, Merten & Merckelbach, 2013). As one reviewer for this paper observed, when objective evidence based on PVT and SVT results indicate exaggeration or over-reporting, we must believe our own tests. We would further specify that when PVT/SVT failure occurs in the presence of an external incentive, unless the examinee does not meet the other criteria in the multidimensional malingering framework (i.e., marked discrepancies, exclusions), a malingering determination is likely indicated.

A careful examination of the patient’s history will help inform on whether there is a somatoform condition with or without malingering. For example, the malingering examinee may try to limit contact with health professionals to reduce the chance of detection; extreme resistance to and defensiveness to being tested may thus signal intentional feigning. In contrast, the somatoform patient (particularly the factitious patient) welcomes the role of patient and finds it intrinsically gratifying; symptoms may also be unduly numerous or emphatic, versus more discrete presentations in malingering (Worley, Feldman, & Hamilton, 2009). Censoring of a personal history that would be damaging to a lawsuit, few reported symptoms but poor test scores, discrepancy between test scores and functioning in daily life (e.g., retaining the ability to drive, manage finances, and engage in leisure pursuits) would also suggest malingering over purely somatic presentations, whereas somatoform presentations might involve few PVT failures, chronic impairments in daily life, and many reported symptoms but relatively normal test scores (Boone, 2017). For somatoform examinees engaging in malingering, there may be a clear change in symptoms after a compensable but minor injury, worsening of symptoms after contact with a personal injury attorney or disability benefits coordinator, or selective impairment at work but not in other settings; these would all be examples of marked discrepancies that are incompatible with bona fide illness or injury as per Criterion C. In somatoform patients, a careful review of the examinee’s history may also reveal a number of considerable life stressors and ailments, but that among these, only a compensable one (e.g., a minor collision) has led to disability (Ferrari & Klar, 2014).

Correctly identifying disorders involving deception, feigning, and unexplained symptoms is a diagnostic challenge made more complicated by the fact that these can co-occur in the presence of bona fide medical conditions, including brain injury. In fact, we have had cases of moderate to severe brain injury where litigants initially passed PVTs and SVTs but, as litigation dragged on, began to fail PVTs and SVTs on repeat evaluations in an attempt to appear to have permanent and compensable impairments. Thus, significant brain injury itself is not among the exclusions. However, it is specified that psychiatric or neurological conditions with cognitive impairments sufficient to preclude independence in basic activities of daily living would be exclusions.

Secondary MND, Adjustment Disorder with Specious Symptoms, and Malingering by Proxy

In a proposed revision of the criteria by Slick and Sherman (2013), the category of Secondary MND was proposed to address the co-occurrence of malingering with bona fide developmental, neurological, or psychiatric conditions, but without providing clear guidelines as to which conditions would meet criteria. With the revised criteria, this category is no longer needed because the exclusionary criteria are now well defined. Similarly, a prior revision proposed the category of Adjustment Disorder with Specious Symptoms, designed to capture feigning to obtain psychosocial gains rather than material–legal secondary gains, directed toward psychological benefits (e.g., increased attention, affection, or support from others), managing problematic relationships (e.g., controlling others) or escaping aversive interpersonal situations or informal obligations (e.g., household chores or schoolwork; Slick & Sherman, 2013). A factitious disorder diagnosis would therefore cover these cases, such as an adolescent faking prolonged concussion symptoms in order to avoid school, maintain the sick role, and gain parental attention. However, one could also argue that faking symptoms to avoid school indeed constitutes malingering, depending on the case. For example, faking concussion symptoms to delay discharge from hospital so as to avoid final exams or to escape the threat of bullying at school would both be examples involving secondary gain (i.e., avoidance of duties, and adaptive behavior designed to escape an undesirable situation, respectively).

In the original 1999 MND paper, the category of Malingering by Proxy was mentioned, and the category was added to a prior iteration of the MND criteria to reflect this relatively rare but important presentation of malingering (Slick & Sherman, 2013). Malingering by Proxy occurs when there are compelling grounds to believe that the examinee acted primarily under the guidance, direction, influence, or control of another individual. Other situations include examinations of younger children where the child performs validly, but information gleaned from parental questionnaires and clinical interview have been deliberately distorted or exaggerated for purposes of secondary gain. Examinees may be vulnerable to the influence of others by virtue of age, neurodevelopmental and cognitive disabilities, psychiatric conditions, or by significant coercion such as threats of physical or psychological harm to self or others. Malingering by Proxy during neuropsychological evaluations has not been extensively studied in the field but has been documented in some settings such as social services, disability eligibility evaluations,

and neuropsychological evaluations of child litigants (Chafetz & Dufrene, 2014; Chafetz & Prentkowski, 2011; Lu & Boone, 2002). In Malingering by Proxy, parents may have significant financial incentives for having a child with cognitive deficits and encourage, coerce, or train children to feign or exaggerate deficits on evaluation. In the medical literature, Malingering by Proxy typically refers to exaggerated reports of physical symptoms, not to faking or exaggerating cognitive deficits, although these could also be seen depending on the condition being faked (e.g., coercion of a child to fake intellectual disability to receive child disability benefits). The Malingering by Proxy specifier applies to the adult influencing the vulnerable examinee, not to the examinee. Because Malingering by Proxy and related conditions such as factitious disorder by proxy (i.e., medical child abuse or Munchausen syndrome by proxy) are complex and poorly understood and may cause considerable harm when misdiagnosed, Malingering by Proxy was specifically not included in the criteria but could be included in future revisions pending more research. Nevertheless, suspicions of medical child abuse or of an adult using a child for purposes of secondary gain (e.g., coercing a child or vulnerable adult to use a wheelchair to make a more convincing case for personal injury damages) should be reported and investigated (e.g., Feldman & Yates, 2018).

Other Considerations

Terminology

The issue of whether the term “malingering” is outdated, pejorative, or outside the purview of neuropsychology (i.e., only appropriate within the purview of the courts/trier of fact) deserves mention. Whether an updated model should use a different term is a valid question. Although noting that the use of this label has at times raised issues in case law, some have nevertheless concluded that ethically conducted and unbiased determinations of malingering are indeed within the purview of experts offering opinions in forensic contexts (Weiss & Van Dell, 2017). Determining that malingering is a matter for only the courts/trier of fact to opine on ignores other settings where the determination of malingering also matters greatly (i.e., disability evaluations, social services settings, brain injury assessment services, ADHD clinics). Whether to use the term “malingering” in a clinical report or in testimony can be a difficult question, but it is a separate decision to be made by the clinician, for the specific case and circumstances, once the certainty of malingering has been established according to multidimensional criteria. As of this writing, for better or worse, the term is still how the field describes this entity.

The problematic nature of the term “malingering” was also brought up over 20 years ago in our prior MND paper, where we noted that the field as a whole has a tendency to use a term until it is perceived as being too pejorative and then to move on to a new term that then itself becomes pejorative. As we did in 1999, we retain the term “malingering” in our new model because none of the alternative terms appear precise enough to describe the clinical entity known as malingering currently in the field. Boone (2007, 2011) has suggested that the term be dropped in favor of labels that do not imply intent, such as “noncredible neuropsychological dysfunction”; other terms such as “misrepresentation” and “disability exaggeration” are also alternatives to malingering suggested by the reviewers of this paper. Currently, malingering has a fairly clear meaning to most practitioners in that it requires the external incentive criterion in particular and cannot be due to other specific conditions. Nevertheless, it is possible that these or future terms will gain traction and be accepted in the field.

The Gray Zone: Invalid or Noncredible Assessment Results

An important knowledge gap is the status of examinees who fall in the gray zone, that is, those examinees who meet some but not all criteria and who may have met “Possible” MND according to the prior criteria. Emerging research is beginning to shed light on examinees whose presentation falls in this intermediate zone—that is, individuals whose performance falls close to failure cutoffs on PVTs or SVTs or those who meet some but not all multidimensional malingering criteria (Erdodi, 2017; Erdodi & Lichtenstein, 2017; Proto et al., 2014). These would include, for example, the examinee who, following a minor motor vehicle collision and questionable concussion, is seen for an independent neuropsychological evaluation in the context of personal injury litigation and who reports implausible symptoms (e.g., severe memory problems), fails a single PVT, has inconsistent responding on an SVT, and has memory scores below the 10th percentile and whose behavior during the evaluation is suspicious for exaggeration (e.g., long pauses, complaining about how difficult the tests are, exaggerated pain behaviors). Although this examinee’s test results would be questionable, certainly not attributable to the effects of a concussion, and malingering criteria would not be met, there would be nevertheless sufficient evidence to conclude that the assessment results are invalid and indicative of noncredible neuropsychological dysfunction. The clinician may thus report that the test scores are not plausibly related to the questionable concussion and that there is suspicion, based on the clinical presentation, of probable exaggerated cognitive problems on objective testing and self-report. It is important to note that the malingering criteria are not designed to detect every instance of exaggeration, particularly more subtle forms, such as the person who slightly exaggerates

the frequency of depressive episodes in interview but whose symptom report does not go beyond cutoffs on SVTs. Instead, the criteria are a way to operationalize a method for identifying bona fide/high likelihood malingerers and to also ensure that false-positive malingering determinations are minimized. As noted by Larrabee, because malingering models require key features including external incentives, multiple indicators of performance/symptom validity, and discrepancies between symptom report, test results, and known patterns of brain functioning, “it is the combined improbability of findings, in the context of external incentive, without any viable alternative explanation, that establishes the intent of the examinee to malingering” (p. 627, Larrabee, 2007, 2012a).

It is also essential to appreciate that not meeting criteria for neurocognitive, somatic, or psychiatric malingering does not, of course, automatically signal a valid assessment. A person might show strong evidence of exaggeration or invalid test results, but not meet all criteria set out for malingering. Some examinees may meet some criteria for invalid presentation (Criterion B) but have no evidence of external incentives or marked discrepancies, or have developmental or neurological conditions that exclude malingering. In these cases, the assessment results would be invalid but not indicative of malingering per se. Invalid test scores can occur for a variety of reasons separate from malingering, including lack of cooperation or noncompliance, for example, as a result of a psychiatric condition interfering with engagement in the testing process and with adherence to test instructions (e.g., oppositional defiant disorder, antisocial personality disorder, schizophrenia, severe depression, active substance use, severe ADHD), but may also occur due to overt or covert resistance to testing (e.g., refusal to participate fully in an assessment the examinee does not want, as in defense assessments for personal injury cases or court-mandated evaluations). In these cases, Criterion B provide a way of operationalizing how to detect and define invalid test scores.

Future Directions

The new malingering criteria are an attempt to provide a more fine-grained description of malingering symptoms by expanding criteria to include not only cognitive symptoms, but also somatic and psychiatric symptoms so as to better capture the various manifestations of malingering in clinical practice. This parallels a more general trend from a global “faking bad” approach to a more focused investigation of malingering of specific conditions (Smith, 2018). In so doing, we hope that the model may also be better able to differentiate between the different subtypes of malingering.

It could also be argued that what the field needs is multiple, separate, specific malingering models designed to describe unique and distinct types of malingering (e.g., a model for malingered brain injury, a model for malingered ADHD, a model for feigned psychosis in criminal cases), in the vein of the MPRD model which applies to a specific form of malingering characterized by chronic pain and exaggeration on physical examination. We hope that our new model will provide a framework for helping spur the development of more specific models for detecting malingering in its many forms.

We also hope that future research will help better define and validate each of the individual criteria in the model. Looking back, we never anticipated the volume and quality of malingering research that followed the publication of the MND, a body of research that has now allowed us to refine the criteria to a much further degree, for example, with regard to the number of PVTs to administer, the utility of SVTs in the determination of malingering, and the specifications relating to exclusionary criteria. We hope that by operationalizing each criterion in detail, future research can better inform the next revisions of the criteria, for example, on the optimal number and types of marked discrepancies that best support the determination of malingering, on the kinds of external incentives most likely to be found in the context of malingering, on the validation, prevalence, and correlates of the different specifiers, on the role of SVTs in malingering determination, and on studying and validating the criteria in linguistically, ethnically, and culturally diverse populations (e.g., Nijdam-Jones & Rosenfeld, 2017).

Most importantly, we anticipate that the field will begin to shift toward validated multivariate prediction models for identifying invalid performance using combined PVTs and SVTs that are weighted based on their efficacy at detecting malingering rather than focusing on the number or ratio of PVT and SVT failures per se to identify invalid performance. Some have also noted that the MND criteria require further research on reliability and that the field has not begun to adequately address the issue of measurement error with regard to PVT and SVT cutoff scores used to determine malingering (Rogers, 2018b). We agree with both of these positions, particularly the latter, and hope that future research will fill these significant knowledge gaps. In addition, in terms of forced-choice measures, the criteria include cognitive PVTs, not other kinds of PVTs for which research is still quite limited. However, future models may be able to include sensory PVTs (Greve, Bianchini, & Ameduri, 2003), PVTs aimed at physical symptoms such as balance (Armistead-Jehle, Lange, & Green, 2017), other forced-choice procedures for the determination of psychiatric exaggeration (e.g., Messer & Fremouw, 2007; Smith, 2018), or new techniques to detect physiological or imaging-based signs of feigning that go beyond our current testing tools.

Lastly, we reiterate again, as we did in the 1999 MND paper, that the new malingering criteria will need to be field-tested and validated in clinical settings and in research studies and that modifications and revisions will be necessary as the field progresses.

As we did in 1999, we welcome comments and feedback on the proposed model, a model that we see as a work in progress that relies on the efforts of diligent clinicians and researchers to better understand and measure malingering.

In conclusion, we acknowledge the many excellent comprehensive sources on malingering and neuropsychological assessment that partly inspired these revisions, such as those by Boone (2013, 2017), Larrabee (2012), Carone and Bush (2013), Morgan and Ricker (2018), Morgan and Sweet (2009), and Rogers and Bender (2018), as well as the many researchers who have contributed significantly to the field of malingering research in neuropsychological assessment since the publication of the original criteria in 1999, too numerous to mention here. It is because of their work that these expanded criteria are possible, and we hope that advancements in the malingering model will also translate into advancements in the field of malingering detection and improve assessment methods in neuropsychology.

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Conflict of Interest

The authors report no conflicts of interest.

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