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Critical Review of the Content Validity of Miller Forensic Assessment of Symptoms Test (M-FAST)

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Abstract

***Background**: The Miller Forensic Assessment of Symptoms Test (M-FAST) [1] was originally developed for detection of malingering of psychiatric symptoms in forensic settings, but it is now used frequently on other clinical groups such as post-accident patients or war veterans, to assess malingering of non-psychiatric medical symptoms, i.e., on patient groups and on symptoms for which the M-FAST was not validated in accordance with standards of the American Psychological Association (APA).*

***Method**: The M-Fast consists only of 25 items. We undertook a systematic review of all 25 items to evaluate their content validity, i.e., congruence with the intended goal to differentiate malingerers from legitimate patients.*

***Results**: With respect to detection of malingering of psychiatric symptoms, the M-FAST items list many legitimate psychiatric symptoms that are (rather perplexingly) scored as indicators of malingering. A few examples are as follows: auditory hallucinations ("voices") associated with autonomic signs of anxiety **(Item 18)** or with fear of leaving the room or home during such episodes **(Item 22)**, hallucinations lasting for days **(Item 6)**, and olfactory hallucinations (phantosmia) **(Item 17)**, adverse changes of mood while suspecting to be plotted against **(Item 3)**, a belief to have special powers with respect to sensory perception **(Item 13)**, and delusional parasitosis **(Item 20)**. An M-FAST item refers to "feeling depressed most of the time" **(Item 2)** and is also scored as indicator of malingering.*

*With respect to detection of malingering of medical symptoms in survivors of motor vehicle accidents (MVA), examples of unduly contaminated item content include: depressed feelings **(Item 2)**, tinnitus triggered or exacerbated over the duration of stressful interview **(Item 25)**, intense nightmares that occur concurrently with weight loss **(Item 12)**, neurological symptom of formication **(Item 20)**, phantosmia **(Item 17)**, and fluctuation of symptoms as if someone is "turning them on and off ..." **(Item 14)**.*

***Discussion and Conclusions**: More than a half of M-FAST items have content that can be legitimately endorsed by psychiatric patients, or those injured in MVAs, or by injured war veterans, but in the M-FAST, these items are erroneously scored as indicators of malingering. This can lead to high rates of false positives, e.g., 33% to 63% in the 2017 study by Weiss and Rosenfeld.*

Keywords: *malingering, M-FAST, thought disorder, delusions, hallucinations, post-concussion syndrome, whiplash syndrome*

Introduction

The Miller Forensic Assessment of Symptoms Test (M-FAST)[1] is a widely used test in forensic evaluations of patients for malingering of psychiatric illness. The test manual reports validation studies on forensic inmates.

Unfortunately, the M-FAST is now used, in error, for assessments of malingering of other medical symptoms both in forensic and non-forensic settings. Such "off label" uses on non-forensic patients and for identifying symptoms other than for which the test was validated violate the standards for psychological testing, as stipulated by the American Psychological Association (APA). These require that tests be used only on patient groups for which they were specifically validated and for the detection of symptoms that were the focus of the original validation studies. Among the most inappropriate "off label" applications of the M-FAST are those on patients injured in motor vehicle accidents (MVAs), or patients with comparable injuries from industrial accidents such as on construction sites, and on war veterans injured in combat, such as those with post-concussion and whiplash syndromes.

Failure to comply with APA requirements can result in a large proportion of patients being misclassified as "malingerers." For example, a 2017 study by Weiss and Rosenfeld[3] on trauma-exposed African immigrants showed that the M-FAST "*produced high false positive rates in the honest groups, ranging from 33% to 63%*."

There are frequent misunderstandings about the requirements of "specific" validations of similar tests. For example, a study by Ahmadi's team[4] "validated" the Persian version of M-FAST to detect malingering of PTSD in Iranian war veterans. The data in similar studies may be confounded by these soldiers' exposure to various undiagnosed closed head injuries from combat, including those from explosive blasts, with the sequelae of post-concussive or other neurological symptoms.

Many M-FAST items appear descriptive of potentially legitimate psychiatric or neurologic symptoms. An essential question is whether the M-FAST was properly validated even for its initially intended use on forensic patients, with the goal of detecting malingering of psychiatric illness. The M-FAST manual[1] describes 3 studies of "criterion validity" based on known group design (see pages 26-27). In all three, malingerers were identified via their scores on the Structured Interview of Reported Symptoms (SIRS), i.e., via an instrument that could not provide an absolutely correct diagnostic classification. For this reason, these 3 studies could be considered, at most, as providing data on convergent validity, but not on the criterion validity. A misrepresentation of such "validation studies" as studies of "criterion validity" is a confounding factor in estimates of the test's specificity and sensitivity. For example, if both the M-FAST and the SIRS would misclassify psychiatric patients with an intense thought disorder as "malingerers," the outcome of such validation studies overestimates the test's efficacy.

Another "criterion" validity study reported in the M-FAST manual (page 27) compared M-FAST scores of students instructed to malinger mental illness to those responding honestly. This is not an acceptable validation according to APA standards because the purpose of the test is to separate legitimate patients from malingerers, not just reporters from non-reporters of symptoms. Since the M-FAST appears to mainly list legitimate medical symptoms, but scores them as indicative of malingering, the "instructed malingerers" reported more of these symptoms than students instructed to respond honestly. A proper validation of M-FAST would require a comparison of true malingerers (or at the least of "instructed malingerers") to legitimate forensic psychiatric patients with the same target symptoms as those feigned by malingerers.

The present study evaluates the content validity of individual items of the M-FAST with a particular attention given also to its presently frequent "off label" use on patients injured in motor vehicle accidents (MVAs), or in industrial accidents, and on injured war veterans with post-concussive and other neurological signs. Clinical experiences suggest that such patients are too often misdiagnosed by the M-FAST as malingerers or suspected malingerers. The APA *Standards for Educational and Psychological Testing*[2] stipulates on page 30: "*When unintended consequences result from test use, an attempt should be made to investigate whether such consequences arise from the test's sensitivity to characteristics other than those it is intended to assess or from the test's failure to fully represent the intended construct*."

It appears from clinical impressions that the main confounding factor in the M-FAST is an inappropriate item content that is prone to classify legitimate

injured patients or war veterans as malingerers and probably also misclassifies persons with severe psychiatric illness. The APA *Standards for Educational and Psychological Testing*[2] explain on page 54: "*One potential source of construct-irrelevant variance in test scores arises from inappropriate test content, that is, test content that confounds the measurement of the target construct*."

The present study systematically examines the validity of item content of the M-FAST with respect to the explicit target construct, i.e., malingering of psychiatric illness. The present study also includes the examination of content validity of M-FAST items when this test is applied to clinical groups and medical symptoms for which it was never properly validated (e.g., post-accident patients or war veterans).

Method

The content of M-FAST items is not reproduced here in full to avoid violation of copyrights. Our discussion of the item content would therefore make more sense to those health care professionals who have a list of all M-FAST items and who know the M-FAST scoring system.

The test consists only of 25 items. Each item, if endorsed, counts one point towards the diagnosis of malingering. The cut-off score is > 5 points, see page 16 in the M-FAST manual: "*it is unlikely that an individual with an authentic clinical disorder will obtain an M-FAST score of 6 or greater*." [1] As already mentioned, statistical data published by Weiss and Rosenfeld[3] showed that the M-FAST "*produced high false positive rates in the honest groups, ranging from 33% to 63%*."

For the purpose of our study, i.e., for the systematic review of items, the content of M-FAST items was separated into 5 categories:

(1) Items descriptive of legitimate psychiatric symptoms.

(2) Items with two parts. For a fictitious example, the first part might be "*I have frequent nightmares about ghosts*" and the second part "*This keeps happening only when I overdose on my laxatives*." The two-part item is scored as one point towards malingering only if the patient endorses both parts as true. It needs to be noted that any item with complex logical structure may pose comprehension problems for psychiatric patients with thought disorder (whether it has already been diagnosed or not yet diagnosed).

(3) Items that describe legitimate symptoms within the post-concussion and whiplash spectrum.

(4) Observed versus reported symptoms. Items that require the psychologist to compare overt behavior of the patient to a particular symptom reported by the patient. As a fictitious example, if the patient would endorse the item "*The scalp of my head feels unbearably itchy*," but if the psychologist observes no scratching of the scalp with fingers, the patient's response would count one point towards the diagnosis of malingering.

(5) Items that could be endorsed also by healthy normal persons without an intention to malinger.

Results

M-FAST Items Descriptive of Legitimate Psychiatric Symptoms

Content validity of a psychological test is the degree to which the content of test's items matches the conceptual content domain of the target construct. [2] This key construct, in the M-FAST, is "malingering of psychiatric illness." Accordingly, this study examined whether or not the items of M-FAST seem likely to be endorsed only by malingerers and not by patients with related legitimate psychiatric conditions. A major complication is also as follows. A forensic inmate may be referred for psychological evaluation of malingering when correctional officers suspect that this inmate intentionally shows strange behaviours to be deemed mental illness. The question arises whether or not any M-FAST items have the capacity to differentiate malingerers from psychiatric patients with thought disorder, especially those described as treatment resistant (see an example in Cernovsky and Oyewumi[5]). Such undiagnosed patients may be found among the homeless in the streets and also in correctional institutions where they are erroneously considered not psychiatrically ill but asocial, or incorrigibly oppositional, and defiant of authority figures.

The M-FAST items must not describe experiences of severely ill psychiatric patients. For example, some of these patients may claim to have special powers with respect to sensory perception **(Item 13)**, or they may hallucinate continually for many days **(Item 6)**, or they may experience olfactory (or other hallucinations), especially at the time when their attention is less distracted by surrounding daytime

stimuli such as while quietly resting at bedtime **(Item 17)**. It should be noted that phantosmia (olfactory hallucinations) may be temporary or permanent sequelae of head trauma[6,7] (many forensic inmates have history of closed head injuries from brawls) or they can be triggered by upper respiratory infections.[8,9] Phantosmia is also noted in Parkinson patients as a common non-motor manifestation of their disease, and it can occur before the onset of Parkinsonian motor symptoms.[10]

Some patients may describe their auditory or visual hallucinations as associated with anxiety **(Item 18)**, for example, when seeing "*snakes crawling on the floor in the hallway*" of the hospital or when hearing "*tortured persons scream*." The autonomic signs of anxiety at those times could include perspiration, tachycardia, etc. Some psychiatric patients experience a fear of leaving their room or their home during such episodes of frightening hallucinations **(Item 22)**.

Some psychiatric patients may report hearing loud music in their mind in an intrusive and unpleasant manner, causing anxiety similar to hearing hallucinatory "negative or critical voices." Some may even endorse, on M-FAST items, hearing a loud radio many times a day **(Item 21)** while no radio is around.

Symptoms of psychiatric patients may fluctuate considerably in intensity and frequency. Some patients describe these changes in the presence or absence of psychiatric symptoms with words similar to "*as though somebody controls my symptoms, turning them on and off* ..." **(Item 14)**

With respect to delusions, these certainly are a legitimate psychiatric condition, even though some of these are rare, for instance, the delusional parasitosis, also called delusional infestation (DI), with reports, by patients, of insects crawling on or under the skin.[11] **(Item 20)** The review by Freudenmann and Lepping[12] mentioned that "*The mean number of cases of DI per institution or hospital and year has been found to range from 0.6 ... to 20*" and that "*Well over 1,400 definite cases have been published in the literature ...*"

As explained later in this article, the paresthesia of insects crawling in or under the skin can also be a legitimate neurological condition caused by a neurological injury to certain afferent nerve fibres as a part of whiplash trauma to the spine, or from exposure to environmental toxins, or as a part of an incipient (undiagnosed) multiple sclerosis. Some forensic inmates are known to have a history of whiplash injuries.

In addition to already discussed M-FAST items, some forensic inmates may also experience bouts of tinnitus from head injuries sustained in brawls: the tinnitus may be triggered or exacerbated by emotional stress caused by the M-FAST interview. **(Item 25)**

The M-FAST includes even an item that refers to "*feeling depressed most of the time*." **(Item 2)** While even some lay persons with college education recognise it as describing a legitimate psychiatric condition, the M-FAST scores this item as indicator of malingering. Its content closely matches the Item #1 in *Beck Depression Inventory-II (BDI-II)* and also the Item #1 of the *Major Depression Inventory (MDI)* where it is correctly scored as indicative of depression.

The M-FAST happens to also include an item potentially descriptive of manic elation, of "unusual happiness." **(Item 5)**

Tests that include items descriptive of legitimate psychiatric conditions, but score them as indicators of malingering have the deleterious impact of classifying undiagnosed psychiatric patients as malingerers, thus depriving them of helpful treatments while incarcerated, including the denial of pharmacotherapy for conditions such as major depression. This creates an undue financial burden for the community because such untreated inmates might never join the work force after their release from jail: they are more likely to be re-incarcerated.

Items with Two Parts, with Psychiatric Connotation

The M-FAST contains 4 such two-part items. Most of these two-part items seem based on the often unwarranted assumption that a person with psychiatric symptoms such as the thought disorder respects or adequately follows the rules of formal logic, rules that are easy for mentally healthy persons with normal or above average intelligence.

At least two of these 4 items could be endorsed legitimately by a person with mild forms of psychiatric illness. Symptoms such as "not feeling like the usual self," but as a "different person," for instance, while in a bout of intense rage (as if being "the Incredible Hulk") or in its aftermath, can happen in conjunction with certain autonomic signs such dizziness and

light-headedness, tachycardia, nausea, or also with hyperventilation. **(Item 16)**

Persons experiencing the acute bout of a persecutory delusion may also experience an abrupt mood change in conjunction with the surge of fear of "*being plotted against*." **(Item 3)**

A jail inmate with debilitating psychiatric illness is more vulnerable to physical abuse. He may episodically undergo beatings by violent fellow inmates. The beatings might include nausea causing blows to the abdomen or repeated punches to the head resulting in a post-concussive nausea. Such an inmate could be experiencing nausea related weight loss as well as concurrent intense nightmares. **(Item 12)**

Furthermore, there is also a semantic problem with the wording of M-FAST items. In colloquial English, the word "always" is frequently used to mean "often." Thus, psychiatric patients as well as some normal persons complain about feeling "*always tired*" or "*always hungry*" or about their commuter train arriving "*always late*." Similarly, some severely ill psychiatric patients, especially those somewhat confused by thought disorder, may indicate that they "*always*" obey their hallucinatory commanding voices. **(Item 4)**

Items Descriptive of Legitimate Symptoms within the Post-Concussion and Whiplash Spectrum

As already mentioned, many clinical psychologists contracted by insurance companies use the M-FAST on the erroneous premise that it also diagnoses malingering of medical conditions in addition to typical psychiatric illness for which it was intended and even in clinical groups for which the M-FAST has not been specifically validated. Such "off label" uses of M-FAST are especially frequent in patients injured in motor vehicle accidents (MVAs), or in industrial accidents, or even in war veterans injured in explosive blasts that cause the symptoms of post-concussion or of whiplash syndrome. Several M-FAST items describe legitimate symptoms potentially experienced by such injured patients, as shown in the following paragraphs.

The symptoms of injured patients usually fluctuate in intensity, e.g., headaches, tingling, or paresthesia in some of the limbs, or they occur in distinct bouts such as a stabbing back pain, or tinnitus. The injured patient might describe this fluctuation of symptoms in words similar to "*as though somebody controls my symptoms, turning them on and off …*" **(Item 14)**

Some patients might be relatively free of symptoms such as tinnitus or a headache at the beginning of the evaluation session with the insurance contracted psychologist, but these symptoms may eventually be triggered or exacerbated by psychological stress of the adversarial interview with the emotionally distant professional, potentially perceived as a mercenary hired to deny the insurance benefits. The probability of such symptoms being triggered or exacerbated over the duration of the interview increases as the patient becomes progressively stressed and tired. **(Item 25)** It is medically inappropriate to interpret such eventual surfacing or exacerbation of symptoms over the M-FAST interview as "*highly suggestive of malingering*" (see page 15 of the M-FAST manual).

Patients debilitated by unrelenting pain and by pain related insomnia and fatigue have less stamina to cope over the full duration of such adversarial interviews: the stress exacerbates their symptoms. Tinnitus is not a rare phenomenon in such groups of medical patients. For instance, in a recent study of post-MVA patients, 75.3% reported tinnitus[13]

Whiplash injuries to afferent nerves at the spine level can cause a subjective perception of tingling in some of the limbs (reported by 68.1% of post-MVA patients in a 2019 study[13]), or numbness in the limbs (reported also by 67.7% of post-MVA patients[13]). Some post-MVA patients also mention another, somewhat similar subjective sensation in their limbs: the formication, i.e., a feeling as if ants or other insects were crawling on or even under the skin. **(Item 20)**

The paresthesia of formication occurs also in other legitimate medical conditions, for instance, in "peripheral neuropathy." Beran's[14] 2015 study of peripheral neuropathy mentions the "*feeling as if ants are crawling over/under the skin*." In some other groups of legitimate medical patients, paresthesia was determined to be a consequence of exposure to environmental toxins.[15] In a 2006 study, 50% of patients with multiple sclerosis reported formication in their extremities.[16] In such groups of legitimate medical patients, the etiological background seems different from the delusional parasitosis of psychiatric patients.

Some post-accident patients, presumably in the medical context of their neurological injuries, could also report phantosmia when their attention is less distracted by surrounding stimuli such as while quietly resting at bedtime. **(Item 17)**

It is very common for post-accident patients, those who have been in severe unrelenting pain for many months and also experience post-concussive symptoms, to report "*feeling depressed most of the time*." **(Item 2)** In a 2019 study,[13] 91.8% of post-MVA patients reported depression or tearfulness.

Furthermore, when the processing of applications for much needed post-MVA treatments or for other insurance benefits is repeatedly delayed by administrative barriers, the discouraged patients may feel "*that they don't really matter*" **(Item 23)** to others, such as to the insurance clerks or to the unempathetic insurance contracted psychologist.

Items with Two Parts, Administered to Post-Accident Patients or War Veterans

Some of the patient's answers may be given in error due to verbal misunderstandings, fatigue, or distractions caused by pain, tinnitus, dizziness, concentration problems, etc. These misunderstandings are especially likely to occur with the two-part items (see the full text of M-FAST).

The attentional focus of post-MVA patients is usually impaired. The Rivermead Post-Concussion Symptoms scale[17] lists "impaired concentration" as one of the post-concussive symptoms: the 2019 study[13] determined, via responses to Rivermead items, that 90.8% of post-MVA patients reported problems with impaired concentration.

There are other practical difficulties with the two-part items of the M-FAST. The instructions for administering the M-FAST (see the manual, page 10) emphasize that the psychologist should avoid explanations of the items or conversations about the items: "*Some examinees will typically respond to interview items with questions of their own. With few exceptions, the interviewer should respond by saying 'I am interested in your perceptions,' and then repeat the item*." [1]

On the same page, the M-FAST manual also instructs the interviewer that "*It is very important for the interviewer to correctly set the stage from the beginning of the administration. Allowing the examinee to provide no response or to elaborate extensively on his or her symptoms will likely result in a difficult, time-consuming, and non-standardized administration. Interviewers may believe that it is impolite to interrupt when an examinee begins to elaborate on his or her symptoms or psychological problems during the interview. However, the interviewer must be able to redirect the examinee to respond to each item with minimal or no elaboration,*"[1]

This attitude may make the post-MVA patient feel rushed without being allowed to properly comprehend the M-FAST questions. The patient may perhaps even suspect being fooled into "*denying*" that he or she experiences certain important post-accident symptoms, including such as the repetitive "*frightening nightmares*" **(Item 12)** of MVAs. This may result in a misunderstanding in which the patient (who gained weight since the MVA because persistent pain prevents him from continuing to be physically active) also endorses even the second part of the item indicating that it occurs *"only when losing weight*." Some post-MVA patients, however, indeed experience weight loss due to nausea (nausea is a post-concussive symptom, reported by 48.0% of post-MVA patients) or due to loss of appetite generally associated with pain, often concurrently with nightmares such as on MVA themes. The M-FAST instructions make the interviewer pressure the injured patients to provide rapid responses without being allowed to inquire about the meaning of the items. Their post-concussive symptoms prevent them from providing logically accurate rapid replies, especially in the context of mistrusting the unempathetic psychologist.

Observed Versus Reported Symptoms in Post-Accident Patients or War Veterans

Some M-FAST items require the psychologist to observe discrepancies between overt behavior of the patient and a specific symptom reported by the patient. In the fictitious example given here earlier, if the patient endorses the item "*The scalp of my head feels unbearably itchy*," but if the psychologist then observes no scratching of the scalp with fingers during the brief assessment session, the patient's response would count one point towards the diagnosis of malingering.

The patient might legitimately endorse certain symptoms without the psychologist being able to notice the presence of these particular symptoms in the patient's overt nonverbal behaviour during the brief evaluation session. For instance, when the patient reports headaches, the psychologist might attentively monitor the patient's nonverbal behaviour for presence of the obvious signs such as the patient

touching his or her head with a pained expression. In some cases, however, the patient's attention may be distracted from pain by the stress of such adversarial interview. Some dentists or physicians intentionally distract the patient's attention from pain during painful medical procedures, to avoid overusing powerful analgesics.

When a patient reports restlessness with difficulty remaining seated in a chair, this same patient may be referring to his or her prevalent behaviour while at home, rather than to the immediate behaviour during the M-FAST interview. In fact, this post-MVA patient may have intentionally ingested a large dose of analgesic medication to cope with the travel to the adversarial psychological assessment and back home. Post-MVA patients who frequently adjust their sitting position at home or in a car due to persistent back or neck pain, do not necessarily display such externally restless behavior during the M-FAST interview. **(Item 1)** In fact, some may intentionally avoid abrupt moves, afraid to trigger sudden stabbing pain associated with increased muscular tension during the stress of adversarial interrogation by the insurance contracted psychologist.

It is also doubtful whether certain nonverbal behaviours such as "deep breathing" are always easy to notice. The post-accident patient may have been exposed to the psychological technique of pain reduction via deep diaphragmatic breathing:[18] this technique could also help to cope with stress of the adversarial interview. The technique is popularized in educational videos on YouTube. Patients who practiced this technique for several weeks while suffering from intense pain, might perform this breathing more subtly than beginners, and more efficiently. Of course, this breathing technique is often used intentionally when the person has to sit down to cope with symptoms such as dizziness, nausea, or bouts of sudden stabbing pain, "*in order not to get sick*." **(Item 11)** The semantic structure of this item may be interpreted by post-MVA patients in ways different from the meaning intended by M-FAST author.

Items Potentially Endorsed Also by Healthy Normal Persons without Intent to Malinger

Novels by existentialist writers (e.g., "*L'Étranger*" by Albert Camus) often evoke the individual's feeling of "*not belonging*" into the mainstream social environment, a sense of being "*too different*," almost as if "*from another planet*," or a "*misfit*" that "*does not seem to matter to others*." Miguel de Unamuno's book "*Del sentimiento trágico de la vida*" can also be mentioned in this context. The existentialists as well as many psychiatric patients or the post-accident patients and war veterans after many months of unrelenting pain and pain related insomnia and fatigue may identify with such existential despair. Even a normal healthy individual may feel "*I don't really matter*" to others, **(Item 23)** "*I am too different*," as if "*from another part of the universe, from another planet*." **(Item 19)**

Interpersonal differences are ubiquitous, not only with respect to such "*existentialist ideation*." For instance, there are many musically inclined persons who can replay music in their minds (or hear music in their mind) without needing any external device to do so. **(Item 21)** Ludwig van Beethoven was able to hear and compose entire symphonies in his mind after he became deaf.

Discussion

Too many M-FAST items describe legitimate psychiatric and other medical symptoms. This determination is consistent with findings, by Weiss and Rosenfeld[3] in 2017, of "*high false positive rates in the honest groups, ranging from 33% to 63%*."

Legitimate Psychiatric Symptoms Listed in M-FAST Item Pool

It appears from the systematic review of the content of M-FAST items that a psychiatric patient could legitimately endorse more than 12 M-FAST items, i.e., a half or more of the M-FAST. Since each item counts one point towards malingering, it is worrisome that the M-FAST manual[1] instructs the readers, on page 12 that "*an M-FAST score of 6 is highly suggestive of malingering …*" Tests that include items descriptive of legitimate psychiatric conditions, but score them as indicators of malingering a psychiatric illness have the destructive impact of classifying legitimate patients as malingerers, and are thus depriving them of helpful treatments. This increases the societal economic burden because the undiagnosed and untreated persons are more likely to be re-incarcerated than joining the work force after their release from jails.

Such misclassifications are particularly harmful in forensic settings: the legitimately ill but untreated and vulnerable psychiatric patients remain incarcerated

without a treatment for conditions such as major depression. Their psychiatric illnesses make them vulnerable and susceptible to become victims of abuse by violent fellow inmates.

A major consideration is also an undiagnosed thought disorder in relatively taciturn forensic inmates. They may misinterpret not only the logically complex two-part items, but also items in which some final words alter the meaning of the sentence, as in the following fictitious example: "*A street car very frequently travels directly through my bedroom on leap year days*."

Patients with thought disorder or delusions may also misinterpret commonly used words and this can also boost their "malingering" score on the M-FAST or on other similar tests. Briefly, the M-FAST is not a trustworthy measure of malingering. It would also fail as an instrument for assessment of psychiatric symptomatology, given the huge range of possible psychiatric symptoms.

The preparation of more relevant M-FAST items, i.e., those with capacity to differentiate malingerers from persons with legitimate psychiatric illness, would require not only a basic exposure to textbooks of psychopathology, but also an adequate long term clinical experience with very severely ill psychiatric patients, especially with those described as treatment resistant, e.g., those responding only to certain antipsychotics such as clozapine, and only with an improvement that occurs extremely slowly, over months or years (see the example in Cernovsky and Oyewumi[5]).

M-FAST Items Descriptive of Post-Accident Symptoms or Those of War Veterans

Our systematic scrutiny of item content of the M-FAST suggests that too many of its items are potentially descriptive of symptoms of post-accident patients or those of war veterans or of symptoms encountered in other groups of medical patients such as those with multiple sclerosis or Parkinson. The assertion, on page 12 of M-FAST manual,[1] that "*an M-FAST score of 6 is highly suggestive of malingering* ..." is untenable and certainly false. Scoring legitimate medical symptoms as indicators of malingering is not acceptable in medical psychology.

Inappropriate Item Pool

The item content of M-FAST is excessively contaminated by inclusion of various typical psychiatric or post-MVA symptoms that are fallaciously scored as indicators of malingering and by inclusion of two-part items that can be misinterpreted, items based precariously on observed discrepancy of the patient's self-report with overt nonverbal behavior during the brief interview, and items potentially endorsed by normal persons who have no intent to malinger.

If used in forensic settings on inmates who were already in some rudimentary manner pre-screened or pre-selected to be relatively free of psychiatric symptoms obvious in their overt behaviour, the M-FAST perhaps avoids too high rates of false positives and may even "pass" some "validation studies."

If used on severely ill psychiatric patients such as those previously housed on so called back wards of psychiatric hospitals and now living in halfway houses or remaining homeless, the M-FAST might perform poorly, with undue rates of false positives, due to the inclusion in the M-FAST of symptoms of major psychiatric illness, concurrent medical conditions, or thought disorder that makes it difficult for them to comprehend the M-FAST items in a logical manner and to respond accordingly.

High rates of false positives might be obtained also with less severely ill psychiatric patients outside of forensic settings, those evaluated in insurance litigations or in the context of a military court martial. The M-FAST was not properly validated on some of these clinical groups and on medical symptoms frequently encountered in these groups.

It is not clear why the M-FAST author included items such as "feeling depressed" or tinnitus as indicative of malingering. For instance, a review of 39 scientific studies on tinnitus by McCormack's team published in 2016 suggested that, depending on the definition and severity of the symptoms, the "overall prevalence figures for each study ranged from 5.1% to 42.7%."[19] Studies in which the age was recorded showed that the prevalence of tinnitus increases with age.

There is an excessive overlap of M-FAST items with polytraumatic symptom pattern experienced by post-accident patients or by war veterans. False classification of such injured and vulnerable persons as "malingerers" results in denials of therapies and of other lawfully owed benefits. Depriving them of therapy delays their return to the workforce.

The APA "*Standards for Educational and Psychological Testing*"[2] see test validation as an ongoing process, see page 11: "*Validation can be viewed as a process of constructing and evaluating arguments for and against the intended interpretation of test scores and their relevance to the proposed use*." Our article attempts to support this process.

Psychologists who use the M-FAST in their clinical work or in preparation of expert reports for insurance litigations or for other legal proceedings should be aware that the APA "*Standards*,"[2] page 13, stipulate, with respect to test validation, that not only the test author but also "*the test user is ultimately responsible for evaluating the evidence in the particular setting in which the test is to be used*." Insouciant use of M-FAST may lead to malpractice suits. Our content analyses indicate that the M-FAST is not an adequate instrument to assess malingering because very few, if any, of its items appear to have a capacity to differentiate malingerers from legitimate patients: most M-FAST items seem consistent with clearly legitimate medical conditions.

Investigation of M-FAST's Psychometric Properties by Erika Wolf's Team

A statistical study of M-FAST by Wolf's team was published online on April 15, 2020.[20] Their study focused on the psychometric capacity of the M-FAST to detect malingered PTSD in a sample of 209 trauma-exposed veterans, 57.9% of whom were considered to have a probable current diagnosis of PTSD. Wolf's team concluded that "*M-FAST scores were highly correlated with indices of psychopathology while less strongly associated with measures of overreporting*."

Wolf's team[20] used an innovative variant of the procedure popularized by Lezak, Howieson, Loring, and Fischer,[21] known in neuropsychology as "testing-the-limits." Thus, Wolf and her colleagues followed the usual administration of M-FAST by subsequently re-interviewing the participants about responses to all 25 M-FAST items: they encouraged the examinee to elaborate on each initial response.[20] It became clear during these re-interviews that some participants initially (during the standard administration of the M-FAST) misheard or misunderstood some items. Furthermore, in numerous cases, the reported symptom (e.g., depression) appeared plausible and genuine rather than malingered.

Re-interviews were videotaped. All videotapes were then reviewed by a team consisting of at least two clinical psychologists and two psychology research assistants to make scoring decisions about each M-FAST item.[20] The team determined if the item should be scored as malingering. Wolf's team re-interviewed in this manner 176 of their 209 veterans, see data in Table 1.

For instance, Item 2 ("*feeling depressed*") was endorsed initially by 50.0% of the 176 veterans (see the left column of data in Table 1), but then the diagnostic re-interview determined that response to Item 2 would qualify as malingering in only 3.8% of the 176 veterans (see the right column in Table 1.)

A large scoring error was also noted with Item 23 ("*I don't matter* ....."), endorsed in the standard administration of the M-FAST by 42.0% of the 176 veterans, but then the diagnostic re-interview indicated that only 3.3% of responses could be considered indicative of malingering.

All 25 entries of data in the left column are larger than their counterparts in the right: this shows that the standard administration of the M-FAST is systematically biased to produce malingering scores. The effect size calculated of this systematic bias can be expressed statistically as point biserial correlation coefficient r=.49 ($p<.001$, 2-tailed) or Cohen's d=1.12.

The diagnostic re-interview by Wolf's team thus prevented iatrogenic errors involved in the standard scoring of M-FAST items as per test manual.

Misunderstanding and misinterpretation of M-FAST items were not uncommon. For instance, the Item 5 ("*feeling unusually happy*") was initially misheard, misunderstood, or misinterpreted by some veterans as being about feeling "unhappy": the diagnostic re-interview indicated that scoring on the Item 5 in the direction of malingering would apply in only 2.9% of the 176 veterans (see the right column of data). The standard administration of the M-FAST as per its manual leads to misunderstandings.

If relying on the standard scoring system of the M-FAST and using the cut-off score of > 5, 17.2% in this sample of 209 veterans would be classified by the M-FAST as malingerers. As mentioned, Wolf's team divided their sample of 209 veterans into those with probable PTSD and those without it: 57.9% were considered to have a probable current PTSD diagnosis. Wolf's team

calculated the difference in the proportion of veterans with probable PTSD who were classified via M-FAST as malingerers (26.5%) and those without probable PTSD (4.6%): the difference was significant in x^2-square test.[20] Thus, the data indicate that the M-FAST is more likely to misclassify patients with more severe or extensive PTSD symptoms as malingerers than those who experience less PTSD symptoms.

The highest endorsement frequencies were on Item 2 ("*feeling depressed most of the time*"), with 67.8% among veterans with probable PTSD and only 28.4% among the other veterans, and on Item 23 (feeling that "*I don't matter*"), with 56.2% endorsement by veterans with probable PTSD and only 26.1% by the other veterans.[20] These two comparisons were statistically significant in x^2-square tests: this makes us question the validity of the M-FAST.

Thirteen of such paired comparisons involving all 25 M-FAST items (see Table 2 in Wolf's article) were statistically significant, all in the direction of raising doubt about the efficacy of the M-FAST: patients with more medical symptoms were significantly more likely to be scored by the M-FAST in the direction indicative of "malingering." The M-FAST is systematically biased to misclassify more severely ill patients as malingerers than those less ill.

Although the Wolf's study population was limited to veterans with probable PTSD, their results as listed here in Table 1 strikingly concur with our own clinical evaluation of M-FAST items when applied to psychiatric patients with thought disorder, hallucinations, or delusions, and to post-MVA patients such as those with post-concussion and whiplash syndrome.

Table1. *Proportions of "malingering responses" to M-FAST items by 176 re-interviewed veterans, data based on Wolf et al.[20]*

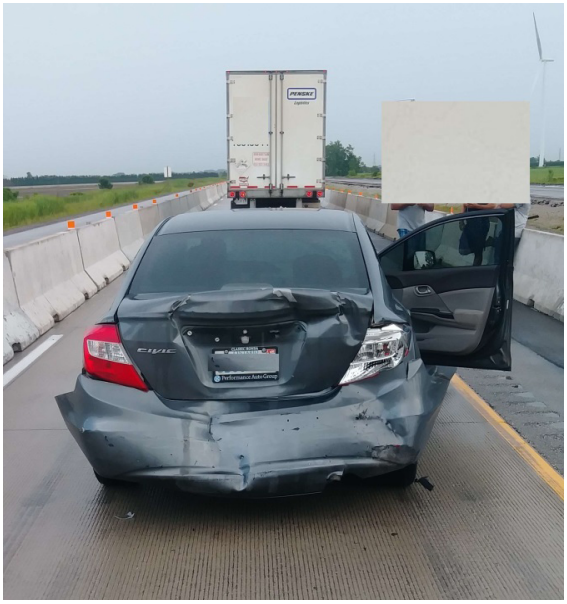
M-FAST Item #	Item endorsement in the initial standard M-FAST interview: *% endorsing the item* (N=176)	Re-interview results: *% of endorsements consistent with malingering* (N=176)
1	18.2	6.7
2	50.0	3.8
3	13.1	1.9
4	3.4	1.0
5	19.9	2.9
6	1.7	1.0
7	8.0	2.4
8	5.7	2.4
9	8.0	3.8
10	5.1	2.4
11	6.3	2.4
12	8.5	2.4
13	0.6	0.0
14	14.2	5.7
15	11.4	8.1
16	11.9	5.7
17	16.5	6.7
18	9.7	3.8
19	5.1	1.0
20	20.5	8.6
21	17.6	7.7
22	14.2	1.9
23	42.0	3.3
24	4.0	2.4
25	6.3	2.9
Average endorsement %	12.9 (SD=11.5)	3.6 (SD=2.4)

Legend: *unpublished data reported here in the left column (% of endorsement of each item in the standard M-FAST interview by the 176 veterans, those subsequently re-interviewed) were kindly provided to us by Wolf et al.[20]*

Illustrative Case History Of A Misclassification By M-Fast

Mr. X. is a 57 year old gentleman with a master's of science degree in chemistry. Prior to his MVA, he worked as a high-school chemistry teacher and used his free time to generate extra income filling in as a long distance courier driver. He had no previous MVAs, but had numerous pre-existing health conditions: sleep apnea, high blood pressure, a history of 2 myocardial infarctions with angioplasty and stent placement, as well as anxiety, and depression.

In July of 2019, while driving his Honda through a construction area on an expressway, the traffic ahead slowed down, and his car was rear-ended by a transport truck. The impact propelled his Honda into another transport truck ahead. The photographs show very extensive damage both to the front and to the back of his Honda: the car was later deemed not worthy of repair.



Mr. X. retrospectively estimates that he lost consciousness for about 2 to 3 minutes following these two collisions and he recalls subsequently feeling disoriented, confused, stunned, dazed, and dizzy (presumptive signs of cerebral concussion).[22] An ambulance transported Mr. X. to a hospital where he underwent a physical examination, X-rays, and received analgesic medication. The MRI showed compression fractures of lumbar vertebrae.

At present, Mr. X. reports headaches and pain in his neck, back, shoulders, right arm, right foot, and in his pelvis and groin. The pain and bone fractures are consistent with the physical nature of his MVA, as documented by the photographs. He is prescribed opiate based analgesic medications. At present, almost a year since the MVA, Mr. X. still has large hematomas on his back. He obtained a score of 59 points on the Rivermead scale[17] of post-concussive symptoms when tested 2 months ago. His other current post-MVA neurological symptoms include mild hand tremor, severely impaired balance, severe tingling and numbness in his limbs, severe form of the syndrome of word finding difficulty, and severe tinnitus in the form of a buzzing or ringing sound. He has also developed fear of driving (amaxophobia).

He was assessed, in January of 2020 (i.e., 6 months after his MVA), by an insurance contracted psychologist via M-FAST and via Green's Nonverbal Medical Symptom Validity Test (NV-MSVT).[23]

The insurance psychologist described the M-FAST in his psychological report and Mr. X.'s results as follows: "*The M-FAST is a standardized 25-item structured interview designed to assess the likelihood of malingering in forensic settings and has been validated in a number of clinical populations.*"

The insurance psychologist concluded that this patient's M-FAST score "*suggests a clear potential for exaggerating or feigning psychological distress.*"

At this point, it needs to be re-emphasized that the M-FAST was intended to assess feigning of "mental illness," in forensic/correctional settings. It does not

and could not measure "malingering" of pain, insomnia, or of the post-concussion-whiplash syndrome of post-MVA patients: the M-FAST was never validated on that patient population and for assessing the typical medical post-MVA symptoms.

Furthermore, my two interviews with this patient and phone calls have never indicated any reports of improbably bizarre or psychotic symptoms or any discrepancies between reported symptoms, observed behavior, and the various medical investigations.

As already mentioned, the insurance contracted psychologist also used Green's NV-MSVT. He described the NV-MSVT as "*a test assessing effort framed as a memory task involving recall and recognition of visually presented stimuli. Near-perfect scores are generally obtained by respondents even when suffering from severe depressive symptoms, developmental delay or mild traumatic brain injury.*"

The NV-MSVT scores of the patient were reported by the insurance psychologist as follows: "*His scores were markedly below the typical score obtained by normal adults and corresponded closely to volunteers trained to fabricate memory deficits. There is a high probability that Mr. X did not exert maximum effort on this test and, indeed, was aware of correct answers on some items yet chose to furnish* incorrect *responses*."

Methodological criticisms of the NV-MSVT are presented elsewhere.[24,25] Above all, the NV-MSVT was never validated on post-MVA patients as would be required in accordance with APA standards. Ferrari et al.[24] explained that "*The basic premise that underlies Green's test, namely that inadequate test effort means malingering, seems logically untenable when applied to certain diagnostic groups.*" A common symptom in injured survivors of serious car accidents is fatigue (the fatigue may be linked to suffering persistent pain and to pain related insomnia, and is also a part of the post-concussion syndrome). In fact, the American Academy of Clinical Neuropsychology published a consensus statement to indicate that scores on "effort tests" can be confounded by factors such as "fatigue" (see page 1100 in Heilbronner et al.[26]).

The author of NV-MSVT, Paul Green, rather inappropriately labeled his test as a "Medical Symptom Validity Test" which implies that it is suitable for assessment of malingering of "*any medical symptoms*." This violates the APA standards.

Richard Frederick's[25] review of Green's tests pointed out Green's methodologically unreasonable claims about their sensitivity and specificity.

Briefly, the M-FAST and NV-MSVT psychologist contracted by car insurance company ignored the physical evidence of the high impact MVA as shown in the photographs, the MRI evidence of compression fractures of lumbar vertebrae, and other similar medical documentation to declare the patient as feigning his post-MVA symptoms.

Conclusions

More than a half of M-FAST items have content that can be legitimately endorsed by psychiatric patients, or persons injured in accidents, or by injured war veterans, but these items are fallaciously scored as indicators of malingering. Furthermore, the text of M-FAST items should not be prone to be misunderstood or misinterpreted by the patients. The M-FAST does not meet the APA standards for psychological tests.

The M-FAST shows a statistically significant bias to more likely misclassify patients who report more of their legitimate medical symptoms as malingerers than patients reporting less symptoms.

Tests such as the M-FAST serve to deny therapies, specialized assessments, and other lawfully owed benefits to injured patients or war veterans. This may increase the economic burden to the society because the untreated patients are less likely to return to work force.

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