

Irremediably Flawed Nature of Analog Validation Methodology of Malingering Tests

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Abstract

Background: Analog validation of malingering tests was evoked by Smith and Burger in 1997 as a method they used to “validate” their Structured Inventory of Malingered Symptomatology (SIMS). Their procedure consists in comparing students instructed to respond honestly with those instructed to feign medical symptoms. The procedure was adopted by others, notably by Holly Miller for the development of her Miller Forensic Assessment of Symptoms Test (M-FAST). Since both the SIMS and M-FAST consist of legitimate medical symptoms incorrectly scored as indicators of malingering, the analog validation could also be used on other known lists of legitimate medical symptoms, such as the Beck Depression Inventory-II (BDI-2).

Method: 20 adults (mean age 47.9 years, SD=16.5) were instructed to respond twice to the BDI-2, at first by responding honestly and then while feigning or simulating “very severe depression.”

Results: The mean score was 6.5 (SD=7.6) for the honest responses and 52.2 (SD=6.2) for feigned or simulated depression. There was no overlap in the distribution of these two sets of scores. In our sample, any cutoff from 30 to 40 points would result in statistics of 100% sensitivity, 100% specificity, and 100% efficiency. The cutoff of 14 or more points (Beck's lower end of the category of mild depression) would result in 100% sensitivity, 85% specificity, and 92.5% efficiency.

Discussion and Conclusion: Our easily replicable study demonstrates methodological shortcomings of analog validations. Malingering tests validated in such a fatally flawed manner, in particular the SIMS and the M-FAST, may adequately differentiate reporters from non-reporters of medical symptoms, but not legitimate patients from malingerers.

Keywords: malingering, test validation, BDI-2, SIMS, M-FAST

INTRODUCTION

The concept of analog validation of psychological tests has been evoked in the 1997 publication, by Glenn P. Smith and Gary K. Burger, while they were

introducing their test of malingering known over last 2 decades as the Structured Inventory of Malingered Symptomatology (SIMS).^[1,2] The unusual “validation” procedure used by Smith and Burger compared only SIMS scores of college students instructed to feign

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medical symptoms to those instructed to respond honestly. On page 188 of their SIMS article in 1997, Smith and Burger acknowledged that *“there are a number of limitations with this test. The greatest limitation is that this investigation is analog-type research with limited generalizability. No criterion groups were used (e.g., subjects suffering from genuine psychosis). The incentive provided subjects to malingering (i.e., extra credit) was certainly not as compelling as that encountered by those malingerers in forensic settings (i.e., escaping criminal prosecution). Subjects were not formally screened for psychopathology.”*^[1]

The intended purpose of the SIMS is differentiating malingerers from legitimate patients, but no adequate samples of real and legitimate medical patients were used to demonstrate its validity. Methodologically sound validations of psychological tests must demonstrate that the test does what it is intended to be used for, i.e., the capacity to indeed differentiate malingerers from legitimate patients. These validations must also proceed separately on each of the clinical groups for which the test is intended and marketed commercially. The standards for developing psychological tests as stipulated by the American Psychological Association are very clear on this subject.^[3] Unfortunately, the commercially marketed SIMS manual^[2] fails to adequately address such flaws.

Table 1. *Overlap of item content of BDI-2 with the SIMS*

Beck Depression Inventory-II (BDI-2)	SIMS
Item 1: Sadness	Items 47, 6, 16, 17
Item 2: Pessimism	Item 72
Item 3: Loss of Pleasure	Item 55
Item 10: Crying	Item 23
Item 12: Loss of Interest	Item 55
Item 15: Loss of Energy	Item 52
Item 16: Change in Sleeping Pattern	Items 19, 32
Item 19: Changes in Appetite	Item 24

For instance, with respect to Beck’s Item 1 that rates the extent of “Sadness” in the BDI-2, the SIMS contains the Item 47 *“I am depressed all the time,”* but scores it as indicator of malingering.

Given the overlap in item content shown in Table 1, it is possible that the entire BDI-2 could be “validated as a measure of malingering” using the same procedure and statistics as did Smith and Burger. The present study examines the outcome of this attempt.

It has been shown in several studies that almost all SIMS items list or evaluate legitimate medical symptoms,^[4,5,6,7] but they are incorrectly scored as indicators of malingering. This is the reason why the “analog validation” showed a significant difference in SIMS scores between students instructed to malingering and those instructed to respond honestly. This difference is best described as a difference between reporters and non-reporters of symptoms and cannot be naively generalized to indicate a capacity to differentiate malingerers from legitimate patients. Both malingerers and legitimate patients can be characterized and pooled as “reporters of symptoms:” both groups usually obtain higher SIMS scores than healthy persons who have no intent to malingering.

The available evidence suggests that the “analog validation” may function well on such lists of legitimate medical symptoms. It is noteworthy that some SIMS items overlap extensively in their content with those in the Beck Depression Inventory:^[8] very similar items are scored in the Beck as measuring the level of depression, but are falsely scored in the SIMS as indicators of malingering of “affective disorder,” see Table 1.

METHOD

The BDI-2 was administered to 20 adults with the instruction to complete it twice; first, while responding honestly and then while either feigning very severe depression or imagining how a person with “very severe depression” would respond. Thus, each person produced two sets of BDI-2 data that seem adequately equivalent to the validation design relied on by Smith and Burger (the comparison of college students responding honestly to those instructed to malingering).

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Some of the 20 chose, rather than imagining themselves as malingerers, to imagine they were depressed very severely. These two strategies are likely to produce comparable results. Malingerers often use their imagination similarly to simulate responses to build a symptom profile within the ill and disabled range.

Only de-identified archival data with these Beck inventories were used in the present study.

The age and gender of one of the 20 respondents was unknown. In the remaining group of 19, the age ranged from 17 to 73 years, with the average at 47.9 years (SD=16.5) and there were 8 males and 11 females. All 20 persons seemed in reasonably good physical and mental health, most showing no signs of depression. However, no formal diagnostic interview was conducted.

RESULTS

The mean BDI-2 scores were 6.5 (SD=7.6) for the honest responses and 52.2 (SD=6.2) for the instructed malingering responses. The difference is significant in a paired samples t-test ($t=19.0$; $df=19$; $p<.001$, 2-tailed).

With respect to honest responses, one person obtained a BDI-2 score in the range of severe depression (score of 29), two persons within the range of mild depression (scores of 18 and 19), and the remaining 17 persons (i.e., 85%) were in the normal or minimal range.

All feigned responses were above the BDI-2 score of 40, i.e., in the range of severe depression.

It is noteworthy that there is no overlap between the honest responses and those feigned.

Sensitivity, Specificity, and Efficiency of BDI-2 as a Test of Malingering

While describing their development of the SIMS, Smith and Burger provided the following definitions of sensitivity, specificity, and efficiency (see page 187 in their article published in 1997).^[1]

Sensitivity: *"Sensitivity refers to the percentage of malingerers showing the positive results on the test measure."*

Specificity: *"Specificity is the percentage of honestly responding individuals who did not meet criteria values on malingering indices."*

Efficiency: *"Efficiency score is the percentage of subjects correctly classified into either malingering or nonmalingering category."*

Since there is no overlap between the distribution of our honest responses and feigning responses in our sample, any cutoff score from 30 to 40 would result in 100% sensitivity, 100% specificity, and 100% efficiency. In this manner, the BDI-2 could be validated with Smith & Burger's procedure to become an excellent test of malingering, far superior to any test currently marketed for that purpose. With such data, the BDI could be naively declared as "the golden standard" for detection of malingering.

If instead we use the BDI-2 cutoff for mild depression (the mild category starts at 14 points) to classify any individual scoring 14 or more points as a malingerer, the BDI-2 would still "deserve" an excellent reputation as a test of malingering, with the calculated sensitivity of 100%, specificity of 85%, and efficiency of 92.5%.

DISCUSSION

Estimates of Specificity and of False Positives

Estimates of specificity do not generalize beyond the design of analog validation: they tend to perform very poorly when genuinely ill medical patients are compared to malingerers. As already explained, specificity is defined as the percentage of honestly responding individuals who did not meet criteria values on malingering indices. For example, if BDI-2 were used as a test of malingering on a sample of 100 truly severely depressed patients with no incentive or motivation to malingering, the calculated specificity might be 0% because all could be classified by BDI-2 as "malingerers." It is obvious from the content of BDI-2 items and from clinical experience that when very severely depressed patients are compared to malingerers, there might even be no significant difference in their scores.

Although methodologically absurd, the analog validation procedure was accepted widely by some authors and editors, especially those in neuropsychology. Noteworthy is its use by Holly A. Miller to validate her Miller Forensic Assessment of Symptoms Test (M-FAST).^[9] The procedure is described in her M-FAST manual under a methodologically incorrect heading of criterion validity (see page 27) and consists of comparing students instructed to respond honestly to those instructed to malingering. In

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scientific psychology, the criterion validity involves comparing legitimate patients to malingerers, or at least to “instructed malingerers.” If the purpose of a test of malingering is to differentiate legitimately ill or injured patients from malingerers, then demonstration of sufficient criterion validity cannot be achieved by comparing presumably healthy college students responding honestly to those instructed to feign medical symptoms. Hence, the analog validation of the SIMS and also the one of M-FAST are sham validations.

On pages 26 to 27 of her M-FAST manual, Miller reports three other “criterion validations.” However, those are determined, on a closer scrutiny, to be only assessments of so called convergent validity. In these 3 studies, Miller used the old version of Structured Interview of Reported Symptoms (SIRS) ^[10] to divide psychiatric inpatients, forensic patients, or patients applying for mental health services or disability reimbursement into 2 groups: those classified by the old SIRS as malingerers and those classified as honest responders. Miller was then able to show that these two groups differed significantly and in the expected direction in their M-FAST scores. From a methodological perspective, the SIRS test is not a perfect test of malingering with 100% accuracy to justify such use in studies of “criterion validity.” For example, a meta-analytic review of the SIRS by Green and Rosenfeld^[11] concluded that “*genuine patient samples were significantly more likely than nonclinical samples to be misclassified as feigning.*”

Green and Rosenfeld explain on page 103: “*The effect sizes for differences in SIRS total scores significantly differed by type of control group used. Studies that compared suspected or simulating malingerers with nonclinical participants (e.g., students, community members, criminal offenders) obtained significantly greater effect sizes (mean $d=2.19$) than those that compared malingerers with individuals with a known mental disorder (mean $d=1.65$), $Z(20)=3.33$, $p=$ or $<.001$.*”^[11]

Briefly, the M-FAST has not been validated adequately. This flaw is reflected in its rates of false positives in certain clinical groups. For instance, a recent study by Weiss and Rosenfeld^[12] on trauma-exposed immigrants showed that the M-FAST “*produced high false positive rates in the honest groups, ranging from 33% to 63%.*”

As already explained, specificity is the percentage of honestly responding individuals who did not meet criteria values on malingering indices. In other words, in a sample of genuine patients, specificity is the % of patients correctly classified as non-malingerers by the test of malingering. The proportion of false positives is the % of genuine patients incorrectly classified as malingerers. Thus, if there are no inconclusive cases, the % of specificity and the % of false positives add to 100%.

Table 2. Rates of false positives from analog validation and from studies or legitimate patients

	Specificity (as %)	False positives (as %)
Analog validation data:		
Data from SIMS manual, ^[2] page 13, on normative sample of (presumably healthy) college students	87.88%	12.12%
BDI-2 as a “malingering test,” cutoff between 30 and 40	100%	0%
BDI-2 as a “malingering test,” cutoff 14 or more points	85%	15%
SIMS data of genuine patients (with cutoff > 14):		
Richard Rogers’s genuine psychiatric inpatients ^[13]	28.0%	72.0%
US veterans with PTSD ^[14]	17.3%	82.7%
Patients injured in high impact MVAs ^[15]	21.7%	78.3%

The specificity values reported for the SIMS or M-FAST from data based on analog designs may be grossly misleading. The analog validations do not examine rates of false positives in real genuine medical patients: the reported rates from analogue validations are those from control samples of presumably

healthy normal persons. Since the SIMS and M-FAST list legitimate medical symptoms, healthy persons usually report relatively few or no such symptoms, thus producing “low rates of false positives.” This can be demonstrated by comparing rates of false positives for the SIMS and BDI-2 in Table 2: the rates of SIMS

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false positives in normal samples typical of analog validations, including our own analog validation of BDI-2 as a test of malingering, are very low (<16%) and contrast with very high rates of false positives (> 71%) in severely injured or severely ill patients.

If the BDI-2 were applied to a sample of legitimate patients in an acute episode of major depression, the rate of false positives might be 100% and specificity 0%.

When genuine patients report their various medical symptoms, they obtain high scores on tests such as the SIMS or M-FAST, i.e., scores in the “malingering range.” The more ill the patient, and the more encompassing the symptom profile, the higher is the patient’s score on tests such as the SIMS or M-FAST, or also on the BDI-2 if it is used as a “well validated” test of malingering depression. Until recently, claims of SIMS high specificity (such as > .80) perpetuated deception of the public and even of the judges or arbitrators in legal proceedings: specificity values of the SIMS are extremely unsatisfactory when the SIMS is administered to severely ill or injured patients.

Statistical Estimate of the Magnitude of Deception

With the data in Table 2, the group membership (false positive rates reported in analog validations versus those in genuine patients) can be considered as a dichotomous variable. Correlation calculated of this variable to the column listing frequencies of false positives is very high $r=.99$ and significant ($p<.001$, 2-tailed). This correlation is alarmingly high, but may be somewhat lower on some other samples of data. We let the reader decide whether this correlation could represent the extent to which the public is deceived regarding the diagnostic potential of the SIMS, in particular about its low capacity to avoid branding legitimate medical patients as malingerers.

Mean BDI-2 Scores of Malingerers in the Present Study

Our BDI-2 study was conducted to demonstrate, via *reductio ad absurdum*, that the “analog validation” is a fatally flawed procedure, and that the SIMS and M-FAST have not yet demonstrated, via more adequate validation methodology consistent with APA requirements,^[3] any useful capacity to differentiate between malingerers and genuine patients.

Similarly to BDI-2, the SIMS and M-FAST are essentially lists of medical symptoms. However, the BDI-2 is a very useful clinical tool for assessing depression. In contrast, the SIMS and the M-FAST are only lists of symptoms selected and grouped in ways too poorly suited for any clinical purpose.

For example, the Affective Disorder (AF) scale of the SIMS consists only of symptoms of depression or those often associated with depression,^[5] but is not based on an adequate clinical expertise to serve as a meaningful measure of depression in general: the AF scale does not sufficiently sample the full clinical spectrum of symptoms of depression. And conversely, the AF is certainly not a measure of “malingering affective disorders” as claimed by SIMS manual because all AF items in fact describe only potentially legitimate signs of depression while falsely scoring them as indicators of malingering.^[5]

In our present study, the average BDI-2 score we obtained with the instruction to feign or simulate responses of very severely depressed patients is very high, 52.2, with $SD=6.2$. It is noteworthy that mean scores of patients with a severe variety of Major Depressive Disorder reported in a study by A. Beck’s group^[16] was lower (the mean of 34, with $SD=10$). Naïve or heedless malingerers as well as lay persons who malingering can perhaps often obtain much higher scores on such measures than genuine patients, especially if instructed to simulate or feign “very severe depression,” as in our present study. It is of interest in this context that an imaginative study by Thomas Merten’s team^[17] compared SIMS responses of 16 persons instructed to malingering whiplash and other symptoms typical of survivors of car accidents to responses of another group of 16 persons who were given the same instruction, but were warned to proceed cautiously to avoid detection as malingerers. The unwarned group obtained significantly higher average SIMS score (31.6, $SD=11.3$) than the warned malingerers (20.1, $SD=8.7$). This suggests that, if our mock validation of BDI-2 as a test of malingering would proceed with persons warned to “be cautious, to make an effort to avoid detection,” the mean BDI-2 score might be lower.

Social Context of Using SIMS and M-FAST

The SIMS and the M-FAST have much in common when we compare their item content. Both tests list the depression, tinnitus, neurological syndrome of formication, and they incorrectly score these legitimate

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medical symptoms as indicative of malingering.^[4,5,6,7, 18] For example, the M-FAST Item 2 “*feeling depressed most of the time*” and SIMS Item 47 “*I am depressed all the time*” are both (falsely and absurdly) scored in the direction of malingering if answered with a True.

Both the SIMS and the M-FAST conveniently filled in the void of easily administered “psychological” instruments to produce “high rates of detection of malingering” among forensic patients, war veterans, injured motorists, and general medical patients.

Psychologists contracted by car insurance companies are under an implied pressure to detect as many malingerers as possible and they are rewarded by being rehired if their performance suggests above average skills in that particular respect. Using fallacious tests such as the SIMS or the M-FAST helps these “psychologists” to achieve high detection rates, however, on a closer scrutiny, most of those classified as malingerers are in fact “false positives.” The victims of this professional folly are genuinely ill or injured patients. As indicated by SIMS data in Table 2, statistical results from recent years indicate that about 78.3% of patients injured in high impact MVAs,^[15] 72.0% of legitimate psychiatric inpatients,^[13] and 82.7% of US veterans with PTSD^[14] are falsely branded as malingerers and thus deprived of timely therapies and of other medical benefits.

Recommendations

Relevant extracts from test manuals for the SIMS and M-FAST should be studied extensively in graduate courses in psychology, to train students to independently discern false methodological stratagems in construction of such tests and statistically estimate true rates of false positives in clinical groups. This is especially true concerning psychology departments of universities in countries where the SIMS or M-FAST have been promoted, i.e., USA, Canada, Australia, Germany, Spain, Argentina, Italy, Turkey, and Iran.

Similarly, our mock validation of BDI-2 as a measure of malingering presented in this article is offered as a pedagogical tool to make psychologists aware that analog validation is an irremediably flawed method that produces flagrantly false estimates of specificity of tests such as the SIMS and M-FAST. We encourage readers to replicate our BDI-2 based procedure of “analog validations” on other, larger samples, such as college undergraduates and to compare the outcomes to responses of legitimate medical patients.

Administration of the SIMS and M-FAST presents considerable risk to the ill or injured members of the public.^[14, 18, 19] Particularly damaging statistical evidence about these 2 tests is now available from a recent study by VA scientists.^[14] For that reason, the Department of Veterans Affairs should alert their various psychology staff and consultants to the iatrogenic risks inherent in the use of the SIMS and M-FAST scales. Similar steps should perhaps be taken by the National Institute of Mental Health (NIMH).

CONCLUSION

The BDI-2 can very successfully, albeit absurdly, be “validated” by the procedure of Smith and Burger as an excellent test of malingering, with 100% sensitivity, 100% specificity, and 100% efficiency. This demonstrates the injudicious nature of analog validations. Tests developed via analog validations, such as the SIMS or the M-FAST, should never be used on real patients. These tests may have an unprecedented iatrogenic impact on genuine patients, tantamount to the one if indeed using BDI-2 as a test of malingering to deny medical attention and antidepressant pharmacotherapy to severely depressed, potentially suicidal patients.

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