

False Positives in Green's Tests of Malingering on Chronic Pain Patients

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Abstract: *Introduction.* Green's Medical Symptom Validity Test (MSVT) allegedly measures malingering. The test is based on the construct of "effort." Scores in the category of poor effort are interpreted as malingering. The test is very well designed and supported by numerous statistical studies on various clinical groups, except for patients with symptom pattern that combines an intense chronic pain, pain related insomnia, post-concussive symptoms, fatigue, and related depression, such as patients who survived potentially lethal car accidents, or injured war veterans-. The Green's test is often used by psychologists in evaluations of insurance claims related to motor vehicle accidents (MVAs). This article analyses symptom patterns potentially contributing to false positives (i.e., patients falsely classified as malingerers) on Green's test, is i.e., factors which would interfere with their ability to make a consistent effort, show a sustained attentional focus, or even to have the willingness to make such effort. *Method.* Symptom patterns of 103 patients (mean age 42.4 years, SD=14.1, 40 males, 63 females) assessed after their MVA in the context of insurance claims were examined statistically. They were administered the Brief Pain Inventory, Insomnia Severity Index, and the Rivermead Post-Concussion Symptoms Questionnaire. *Results.* The mean ratings of pain were in the moderate to severe range (4 to 8 points on Items 3 to 5 of the Brief Pain Inventory). On the Insomnia Severity Index, 33.6% of patients scored within category of moderate and 64.4% within the category of severe insomnia. The average total score on the Rivermead scale was very elevated: 42.0, SD=5.3, with 85.7% scoring > 30. Moderate fatigue was reported by 25.5% and severe by 65.3% of the patients and 46.9% admitted to severe irritability. *Discussion.* Pain, insomnia, post-concussion syndrome, and fatigue are likely to jointly interfere with these patients' ability to exert sustained effort and consistent attentional focus on the "effort tests" such as Green's. High levels of these symptoms in post-MVA patients are likely to cause Green's test to misclassify many as malingerers, thus leading to denials of their insurance claims for treatment and for other legally owed compensation. The onus is on the publisher of Green's test to demonstrate its validity for post-MVA patients or to develop the norms of this test for that specific group.

Keywords: Malingering, False Positives, Green's Test, Iatrogenic Impact

1. Introduction

The Green's Medical Symptom Validity Test [1] and Green's Non-Verbal Medical Symptom Validity Test [2] are excellent psychological tools if applied to diagnostic groups on which they were validated. These two tests are available only on a commercial basis from Green's publishing. The commercial advertising on the publisher's internet site (as on April 8, 2019) indicated that the test underwent "extensive validation in Canada, the USA, Britain, Germany, and in

Brazil." The test relies on measuring the effort exhibited by the patient on test tasks, i.e., the degree of engagement in the test taking. Scores within the category of poor effort are interpreted as indicative of malingering.

The standards for psychological testing as specified by the American Psychological Association [3] require that each test is to be validated specifically on the group of patients on which it is intended to be used and for which the test is being commercially marketed. These test standards of the American Psychological Association (APA) emphasize that

vague claims of “test validation” are to be avoided to prevent a misuse of the particular test on groups on which it has not been properly validated. Green's tests are used frequently by psychologists contracted by car insurance companies on patients reporting a mix of persistent chronic pain, pain-related insomnia, post-concussive symptoms, fatigue, and depression. The crucial question arises whether Green's tests are theoretically appropriate for such patients with such polytrauma symptom profiles after their motor vehicle accidents (MVAs). Specific symptom patterns of these chronic pain patients could substantially interfere with their ability to exert a consistent and sustained effort on “effort tests” such as Green's and also with their desire to adequately co-operate, particularly in the paradoxical situation in which they would be punished for good performance, i.e., for an extra effort. Some of these patients may indeed malingering or exaggerate their symptoms, but determining the presence and incidence of such malingering is a task far beyond the scope of this research article. The onus rests on the author and commercial publisher of Green's test to verify if subjective reports of such patients are indeed legitimate or only malingered (whether this is more mildly labelled as “symptom magnification,” “exaggeration,” etc.).

The Green's tests must be specifically validated on post-MVA patients first before implying that it is generally “valid” or suitable for that particular use, especially in legal settings in which the patient may be unfairly deprived of therapy or other insurance benefits. According to test standards of the American Psychological Association [3], the test author is responsible to undertake an adequate validation of this test on patients for which the test is commercially distributed, or must clearly state in the marketing and description of this test, that it is not intended for that particular group. The test is not to be blindly administered to clinical groups for which it has not yet been validated. Commercial claims of “test validation in different countries” are not acceptable without an indication of which specific criterion groups were used in such “validations” and a list of groups to which the test should not be blindly extended due to potential iatrogenic consequences.

Persistent chronic pain is rarely present without some degree of insomnia. Over weeks, months, or years, the pain and insomnia jointly produce debilitating fatigue and extensive demoralization that undermines the patients' ability to exert sustained attentional focus and or perform adequately on memory tasks or on other cognitive tasks. In addition, these patients often perceive the numerous insurance hired specialists as “mercenaries” paid to disqualify them from legitimately owed insurance benefits, rather than as helpers, healers, or impartial assessors. The performance patterns of such post-MVA patients are likely to differ from instructed malingerers and from dementia patients, persons with low intelligence, relatively pain-free persons with regular mild traumatic brain injury, etc., i.e., the diagnostic groups on which the Green's tests [1, 2] were validated.

It is known from publications by other authors that such symptom patterns can generate false positives. Patients with

frontal lobe injuries such as from MVAs seem especially likely to be misclassified as malingerers by effort tests. Thus Bigler [4] reports the case of patient injured in an MVA who sustained multiple fractures and whose brain injuries were well documented via imaging studies, but who failed the symptom validity test and would hence be classified as malingerer (Bigler [4], pages 1626-1627). Cerebral concussions (e.g., as assessed by the post-concussion syndrome scales), especially those with frontal lobe involvement, need to be considered in the interpretation of scores on effort tests. Too many insurance hired psychologists still seem unaware that cerebral concussions occur even without visible external head injuries. Recent neuropathological-histological research by Bennet Omalu [5, 6] on autopsies of deceased players of American football has demonstrated that cerebral damage occurs without visible external head injuries and without a full loss of consciousness and often without disrupting the person's capacity to resume, within a few minutes, performing some simple well practiced tasks (such as those in playing football): phenomena such as microvascular trauma or so called axonal shearing are involved in closed head injuries. The sudden acceleration or deceleration of the head in MVAs is more likely to cause such cerebral impairment than the relatively less intense collisions of players in a football game. The gray and the white part of the brain slide over each other during such automobile collisions due to their differential density and axonal shearing occurs with subsequent neurotoxicity. Furthermore, most MVA patients also report symptoms within the whiplash spectrum, i.e., symptoms of injury to cervical or lumbosacral spine that are likely to cause unrelenting chronic pain and pain related insomnia. A review by Hart's team [7] on the impact of chronic pain on neuropsychological functioning indicated impaired attentional capacity, slow processing speed, and slow psychomotor speed. These signs of lower attentional and cognitive performance are then likely to be misinterpreted, by some psychologists, as “poor effort” and hence as malingering.

Some neurological conditions such as multiple sclerosis (MS) have certain symptoms in common with MVA patients afflicted with post-concussion syndrome, whiplash, or some signs of cauda equina: pains and spasms, tingling and numbness, weakness or fatigue, dizziness, balance problems, cognitive problems, sexual dysfunction, bladder issues, and vision problems. Suchy et al. [8] examined 530 clinical cases with well documented MS: all had been independently diagnosed with MS, none were in litigation and all were merely being evaluated for treatment planning or follow-up. Eleven per cent failed the malingering measures. It is debatable whether 11% is an acceptable error. However, if a psychologist assessed 400 cases over the last 6 years, then 44 individuals would be unfairly labelled as malingerers or potential malingerers, and hence unethically denied treatments for pain, insomnia, PTSD, and post-concussion syndrome, and also left without financial support to which they are lawfully entitled to by

their insurance contributions that they may have paid over several decades.

The unique nature of the prevailing symptom pattern of post-MVA patients requires closer attention. It somewhat resembles the concept of Polytrauma Clinical Triad developed by Lew's team [9] in studies on war veterans who sustained mild traumatic brain injuries: these soldiers exhibited (1) pain, (2) the PTSD, and (3) persistent post-concussive symptoms. An investigation of the polytrauma triad in survivors of MVAs was published in 2018 by Peixoto's scientific team [10]. The Lew's Polytrauma Clinical Triad [9] is certainly not unique to military patients, but is also common in post-MVA patients, of course, in addition to their insomnia, fatigue, depressive symptoms, post-MVA generalized anxiety, and usually also irritability.

The present study aims at determining the frequency of reported pain, insomnia, post-concussion syndrome, and fatigue in post-MVA patients.

2. Method

De-identified archival data on 103 post-MVA patients (mean age 42.4 years, $SD=14.1$, 40 males, 63 females) were analysed statistically with respect to pain, insomnia, the post-concussion syndrome, and fatigue, i.e., symptoms that may potentially interfere with the patient's ability to exert sustained effort and sustained attention. The data were from psychological assessments of these patients undertaken after their MVA in the context of insurance claims and consisted of the patients' scores on the Brief Pain Inventory [11], Insomnia Severity Index [12], and the Rivermead Post-Concussion Symptoms Questionnaire [13].

The number of weeks since their MVA ranged from 4 to 142 (mean at 52.7, $SD=31.2$).

3. Results

3.1. Frequency of Reported Pain

The items 3 to 5 of the Brief Pain Inventory [11] are rated on a scale from 0="no pain" to 10="pain as bad as you can imagine." On Item 3 (rating of the recent "worst" pain), the mean rating was 7.9 ($SD=1.5$). On Item 4 (rating of recent "least" pain), the mean was 4.0 ($SD=1.8$). For the Item 5 (rating of "average" pain), the statistical mean was 6.0 ($SD=1.6$). If the "moderate pain" category on this test is conceptualized as involving scores from 4 to 6, and scores from 7 to 8 as indicating a "moderate to severe" category, then all three mean scores (those for worst, least, and average pain) fall within the moderate or moderate to severe category. It is noteworthy that 70.4% of patients rated their average pain at 5 or more points.

3.2. Frequency of Reported Insomnia

The average score on the Insomnia Severity Index [12] was 22.3 ($SD=5.3$), i.e., in the clinical category of severe insomnia, as defined by the authors of the Index. All except 2

patients had scores above 7 points, i.e., within the pathological range. Of these, 33.6% were within the category of moderate insomnia and 64.4% in the category of severe insomnia.

3.3. Frequency of Reported Post-Concussion Symptoms

The 16 items of Rivermead post-concussion syndrome scale [13] are scored from 0 to 4 ("0=not experienced at all, 1=no more of a problem, 2=a mild problem, 3=a moderate problem, and 4=severe problem"). The average total score on the Rivermead scale was 42.0 ($SD=5.3$), with 85.7% scoring > 30 . In clinical reports, the score on the first 3 items is often listed separately from the one on remaining next 13 items (as already mentioned, the scale consists of 16 items). The mean scores on these two subscales were as follows: 6.3 ($SD=3.0$) on the first and 35.7 ($SD=10.0$) on the second subscale. Five of these Rivermead items deal with cognitive or behavioral symptoms that could especially obstruct sustained effort or attentional focus. The mean scores on these items were as follows: 2.9 ($SD=1.1$) for impaired concentration, 2.8 ($SD=1.2$) for slow speed of thinking, 2.7 ($SD=1.2$) for impaired memory, 3.3 ($SD=0.9$) for frustration/impatience, and 3.1 ($SD=1.0$) for restlessness. All these mean five values, if rounded up (i.e., to score of 3 points), can be classified as indicative of a "moderate" impairment.

3.4. Frequency of Reported Fatigue

One of the items listed in the Rivermead scale is "Fatigue." The average score on this item was 3.5 ($SD=0.8$), i.e., in the moderate to severe category. Only one patient did not report any fatigue and yet another patient indicated that this symptom occurred only in the initial stages of his recovery from the MVA, but is no longer present. Severe fatigue was reported by the majority (65.3%) of the patients, moderate fatigue by 25.5%, and mild fatigue by 7.1%.

3.5. Frequency of Reported Irritability

Irritability is one of the 16 items of Rivermead scale of post-concussion syndrome. It is socially disabling due to decreased level of social co-operation and of social popularity. Irritability can be expected to be associated with reduced willingness to make an effort on an "effort" test administered by a psychologist perceived as a representative of the opposing party within the adversarial legal system, i.e., as representing the car insurance company. The self-ratings of the patients indicated that 92.9% admitted to at least mild irritability: 46.9% rated their own irritability as "severe," one patient as "moderate to severe," 37.8% as "moderate," 2% as "mild to moderate," and 5.1% as "mild."

4. Discussion

The high rates of reported moderate to severe pain, insomnia, post-concussion syndrome, and of fatigue cause concern about the appropriateness of "effort tests" on post-

MVA patients and probably also on war veterans with intractable pain and mild traumatic brain injuries. The review by Hart's team [7] leaves no doubt that persistent pain associated with various pain related or post-concussive symptoms interferes with the sustained effort and sustained attentional focus required by "effort tests," including the Green's tests. The manuals for Green's tests are written with excellent clarity, attention to detail, and clear presentation of how the test validation was undertaken. However, these tests are very widely (mis)used, probably without the knowledge of their internationally famous test author, Paul Green, also on diagnostic groups for which it has not been properly validated. Green's test manuals need to be updated to warn about iatrogenic consequences of such misuse. While the clinical psychologist who relies on Green's test may assume to be legally protected when interpreting test scores of post-MVA patients or war veterans "with caution" as *suggestive of symptom magnification or exaggeration*, it is naïve to assume that such statements would not be (mis)understood by insurance officials as a safe signal to unduly delay or deny the insurance claims to the patients. The psychologist could quote, in his defence, if sued for malpractice, that the test publisher indicated that his tests underwent "extensive validation" in many countries.

The possibility that the test taker would logically anticipate to be punished for making the requested extra effort, perceiving it as self-defeating or self-incriminatory, is almost never mentioned in such "expert witness" reports by psychologists on legitimately injured post-MVA patients. This is a major confounding factor in tests of malingering.

While there are malingerers, i.e., persons, who might intentionally fabricate post-MVA symptoms, the very purpose of the Green's test is allegedly to identify such cases. To accomplish correctly such an arduous classification task, Green's test would first have to be validated on post-MVA patients, to preclude ethically excessive rates of false positives, i.e., of patients falsely accused of malingering (or suspected malingering, or symptom magnification or exaggeration) after their "poor effort score" was legitimately due to factors such as persistent moderate to severe pain, moderate or severe insomnia, and by the post-concussion syndrome, or by moderate to severe fatigue. One of possible validation studies should compare patients with post-MVA symptoms who have no insurance claims with those post-MVA patients who apply for insurance benefits, and also with a group of age and gender matched instructed malingerers.

As mentioned earlier in this article, reports were published on a brain injured patient misclassified as a malingerer [4] and also on persons with multiple sclerosis (MS) [8] whose legitimate symptoms somewhat overlap with those of post-MVA patients, but who were with excessive frequency misclassified by similar "effort tests" as malingerers.

Post-MVA patients, war veterans with Lew's Polytrauma Clinical Triad, and also MS patients with similar symptoms often feel misunderstood, ignored, or even mistreated as malingerers by some health professionals, especially by

those hired within the legal adversarial system as experts to deny insurance claim. Suchy et al. [8] pointed out that MS patients "*often experience fatigue as one of the more troubling symptoms in their daily lives. One frustration that patients experience is that fatigue is often 'invisible' to external observers. Thus it is possible that some patients may have produced non-valid performances in an attempt to communicate these symptoms to the clinicians via failed effort tests.*" The conscious or subconscious intent of the suffering patient to behaviorally accentuate and demonstrate the subjectively experienced medical problem to the psychologist in an objectively noticeable manner (perhaps partly as a "cry for help") is one of many confounding factors that usually remain unnoticed, undocumented, or disregarded by psychologists in their expert assessments via Green's test.

Briefly, even if the patient is not making a proper effort, it does not logically follow that the patient does not have the subjectively reported medical symptoms and that malingering is proven. The basic assumption that implicitly or explicitly underlies Green's tests is inherently flawed, in this particular respect, as are such assumptions of frontline clinical psychologists in their prevalent routine (mis)interpretation of the results of these effort tests.

With respect to fatigue, it is noteworthy that the American Academy of Clinical Neurology published a consensus statement to indicate that scores on "effort tests" can be confounded by factors such as fatigue (Heilbronner, Sweet, Morgan, Larrabee, et al. [14], see page 1100).

In the present study, the rates of false positives has been defined as the percent of patients who are falsely categorised as "malingerers" by Green's tests [1, 2] in a particular diagnostic group such as post-MVA patients or war veterans. The rate of false positives should be reported unequivocally both by the test author & publisher in the advertising and in the test manual and ideally also by the test users in their psychological reports on each patient, in order to avoid misinterpretation of the psychologist's report by insurance clerks, insurance adjusters, or lawyers in legal settings.

The very name of Green's test "Medical Symptom Validity Test" may be misleading many of its potential buyers and users as it implies that the test was validated to detect malingering of "any medical conditions." This would constitute an unrealistic claim, especially because the APA Standards for Educational and Psychological Testing specified, over the different editions since 1985, that a test is not to be used on groups for which no adequate criterion validity has been demonstrated. Without any doubt, Green's tests are good psychological tools which, however, need to be used more cautiously and only on those diagnostic groups on which its validity has been verified empirically. Green's validation studies included patients with traumatic brain injuries, dementia, or low intelligence, but not patients with a profile that combines an unrelenting intense intractable pain, pain related insomnia, the post-concussion syndrome, and fatigue.

Some related important disclaimers need to be more

prominently displayed in the test marketing and in the test manual. In particular, the present study documented the presence of specific symptom patterns reported by persons after MVAs that, for logical reasons, would interfere with the basic premise by Paul Green that inadequate effort invariably indicates malingering. Using Green's test on persons with symptom patterns as described in the present article or on other groups with similarly problematic complex symptom patterns is not only unwise and misguided. It involves a high risk for the psychologist to become an unwittingly iatrogenic agent that (unintentionally) provides a "false expert witness testimony" in a legal context causing denials of treatments, and in some cases, financial ruin to patients disabled by their post-MVA symptoms, no longer able to work, hence unable to pay their mortgage, losing their house to the bank, unable to support their children at the university, unable to purchase their medications, etc.

The theory of fundamental attribution error [15] was introduced in social psychology already several decades ago to denote the erroneous human tendency to interpret another person's overt behavior as determined by that person's intention or conscious decisions rather than by external factors. Thus, an insurance contracted psychologist might attribute the lack of effort to the patient's intent to deceive, malingering, and defraud rather than to factors outside the person's control, factors such as persistent severe pain, pain related insomnia, concentration problems due to headaches or the persistent post-concussion syndrome, an associated fatigue, or a deep depression. Psychologists who were themselves injured in MVAs or have otherwise a first-hand experience with unrelenting intense intractable pain over many months with the associated insomnia, and ensuing depression, are less likely to uncritically accept the assumption that "inadequate effort" on cognitive tasks invariably indicates malingering of objectively absent medical symptomatology.

"Effort" itself is a somewhat problematic concept in psychology, and, although commonly used in an intuitive manner by neuropsychologists, does not rest on clear operational definition or construct validation. There is very little in psychological literature that would help us understand "effort" as a well defined hypothetical construct or intervening variable, and hence the use in the neuropsychological literature is often arbitrary and ad hoc.

"Effort" was discussed by Dewey (16) in 1897, with some reference to William James, and the discussion centred on whether "effort" was to be understood in sensory terms, or in some combination of sensory with mental or spiritual aspects. Both James and Dewey leaned to a sensory understanding, i.e., "effort" was a "felt" phenomenon, but mental effort was clearly more difficult to conceptualize than physical. At any rate, the phenomenon, along with presumed internal brain based constructs, fell out of fashion with the advent of behaviourism, and was not resurrected until recently, when it appears in its intuitive and folk-based form in validity testing. The role of "effort" in motivation has never been well defined or researched psychologically.

In Green's testing methods, when failure of effort is found, the attribution is assigned to improper motivation on the part of the testee. Other variables, having to do with the situation, the expectancies, the personality of the testee, or the rapport between tester and testee, are sometimes acknowledged, but usually given short shrift, as noted above.

5. Conclusions

Persistent pain, insomnia, post-concussion syndrome, and fatigue are reported frequently by post-MVA patients and are likely to confound their Green's "effort scores," leading to their frequent misclassification as "malingerers." The basic premise that underlies Green's test, namely that inadequate test effort means malingering, seems logically untenable when applied to certain diagnostic groups. The onus is on the test author and commercial publisher to either adequately validate his test on such patients or to warn, in the description or advertising of his test, that it is not designed for their clinical evaluations, especially in legal context with iatrogenic consequences such as denial of treatments or other compensations by the patient's insurer. Furthermore, the test users need to be aware that some patients might expect to be punished for "good effort," when assessed within the adversarial legal system: their lack of effort does not diagnostically rule out the presence of their other medical symptoms.

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