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Test Review of the Medical Symptom Validity Test

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The Medical Symptom Validity Test (MSVT; Green, 2004) is a brief computerized measure of cognitive effort and memory. According to the test author (P. Green, personal communication, May 2009), the MSVT was designed to shorten the administration of the test's parent version, the Word Memory Test (WMT; Green, 2003), and in response to the increasing demand by physicians for an efficient cognitive effort measure. The MSVT was originally named the Memory and Concentration Test in June 2003, and an official manual was published in October 2004 with its new moniker.

Like the WMT, the MSVT displays common word pairs over two consecutive trials; assesses Immediate Recognition (IR), Delayed Recognition (DR), and the Consistency (CNS) between the two scores to measure effort (cutoffs listed in the test manual); and has Paired Associates (PA) and Free Recall (FR) subtests to measure memory. Both the MSVT and WMT were designed to appear to be actual memory measures, even though the effort subtests can be passed easily by patients with severe neurological conditions (see below). Although the MSVT and WMT both have high sensitivity to poor effort, the MSVT was designed to be easier than the WMT in several respects. Compared with the WMT, the MSVT: a) contains 10 word pairs rather than 20; b) consists of word pairs that reflect one concept (e.g., belly-button) rather than two concepts (e.g., cookies-milk); c) has foils that are more obviously incorrect during the IR and DR subtests; d) assesses DR after 10 minutes compared to 30 minutes; and e) only has two additional subtests to assess memory compared to four.

Normative data for the MSVT are based on more than 1,000 patients in various clinical (e.g., traumatic brain injury [TBI] patients) and nonclinical (e.g., healthy volunteer) groups tested by the author of the test as well as other clinicians and researchers who replicated the ease of these tasks, as detailed in the test manual. Information from the MSVT manual and computer program show that adults with severe TBI or neurological diseases can easily pass the MSVT and that the scores of adult subjects asked to fake memory impairment are below those of patients with advanced dementia, including those who have been institutionalized.

The ease of the MSVT is partly due to the recognition format of the subtests and because the pairs represent a single concept. However, there are also visual cues that help provide information as to the correct answer, such as text length. For this reason, these subtle cues are why even patients administered the test who speak a foreign language are able to pass the MSVT (Richman et al., 2006). To prevent coaching, a "stealth" version of the MSVT is also available, which looks like the MSVT but contains word pairs that are more difficult to associate and subtests which have different psychometric properties. This is very useful, for example, if the examiner has reason to suspect that an examinee may have been coached to do well on any 50/50 forced-choice tasks administered by computer but to perform poorly on other types of memory tests. Since the stealth version is more difficult, it can demonstrate that the patient actually has adequate memory abilities in such a situation.

Consistent with the theory behind the construction of the MSVT, the test is easier than the WMT, and hence, not as sensitive. The test author and his colleague (Dr. Roger Gervais) evaluated 279 patients with the MSVT and WMT who were involved in disability or compensation claims (Green, 2007). While 37% of the patients failed the WMT, 29% failed the MSVT, yielding 80.3% agreement between the two tests. In 14% of cases, the MSVT was passed and the WMT was failed. In 5.75% of cases, the MSVT was failed when the WMT was passed, possibly a reflection of inconsistent effort. Differential performance on the two tests also provides useful information about consistency of test-taking effort, since MSVT scores should all be higher than

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WMT scores. Based on my experience using both tests extensively, while the MSVT is a useful alternative to the WMT when time is of the essence, the WMT should also be used when time permits due to its increased sensitivity.

Unlike all effort tests that preceded them, the MSVT and WMT are unique in that the use of multiple subtests with variable levels of difficulty allows for "profile analysis." Profile analysis is essential to determining whether a failure was due to poor effort or severe cognitive impairment. At its most basic level, a severe impairment profile (also known as the dementia profile) is characterized by a) no scores below chance, b) the mean of the easy subtests (IR, DR, and CNS) being at least 20 or more points higher than the harder subtests (PA and FR), and c) clinical correlates that suggest the presence of dementia or severe cognitive impairment (P. Green, personal communication, November 2008). However, other authors (Howe, Anderson, Kaufman, Sachs, & Loring, 2007; Howe & Loring, 2009; Whitney, Shepard, Williams, Davis, & Adams, 2009) added the requirement that there should be no order violations present, in which the patient performs worse on easier subtests than difficult subtests. For example, the IR, DR, and PA scores should not be lower than the FR score because in genuine neurological illness, patients perform worse on difficult tests compared with easy tests. If a patient were to perform below the cutoffs on the effort indexes but meet all of the criteria of the severe impairment profile, then the failure would not be considered a false positive. Thus, the severe impairment profile can be conceptualized as a configurational safeguard of the test by which severely impaired patients performing below the cutoffs are properly classified as having provided good effort.

Howe and colleagues (2007, 2009) found that use of the severe impairment profile criteria resulted in only a 4.8% to 5.8% false-positive rate in patients (e.g., dementia) referred to a memory disorder clinic. The few false positives occurred due to PA scores being the same as or higher than FR scores and/or because of significant language and comprehension difficulties. In another recent study of a small sample of Iraqi war veterans (Whitney et al., 2009), it was found that 17% failed the MSVT and that none met criteria for the severe impairment profile, yielding a suggested specificity of 100%. Specificity was 90.5% when Howe and Loring (2009) used the dementia profile on the MSVT with a prospective sample of 52 patients at a memory disorders clinic. In a sample of patients with advanced dementia, Singhal, Green, Ashaye, Shankar, and Adams (in press) demonstrated 100% specificity with the MSVT. To maintain specificity and to decrease the small false-positive rate even further, the author of the test is not currently supportive of the use of order violations as part of the severe impairment profile (P. Green, personal communication, May 2009).

Another useful feature of the MSVT is that the test can be used with children. The test manual shows that the MSVT can be passed by children tested clinically with a mean age of 12 and mean Full Scale Intelligence Quotient (IQ) of 88 ($n = 50$), children between ages 6 and 10 ($n = 36$), second grade children (Gill, Green, Flaro, & Pucci, 2007; $n = 20$), and children with a mean Full Scale IQ of 65 ($n = 7$). The study by Gill et al. also shows that children with a Verbal IQ of 70 or below ($n = 23$) can easily pass the MSVT. The MSVT computer program shows that other pediatric groups tested by Dr. Lloyd Flaro easily passed the MSVT effort subtests, such as children with attention deficit hyperactivity disorder, fetal alcohol syndrome, and children with a mean Verbal IQ of 64. Unfortunately, the number of subjects composing these groups was not available in the test manual or in the computer program. The implication of all of these findings is that if children (and adults) with such significant neurological impairments can easily pass the MSVT, then adults with mild neurological injuries/dysfunction who perform lower than established cutoffs are clearly demonstrating poor effort. This makes the finding of a 62% MSVT failure rate in adult patients presenting for an independent psychiatric evaluation (in the context of personal injury litigation or insurance protection claims) all the more remarkable, particularly considering that they did not present with severe neurological conditions (Gill et al., 2007). Similarly, Richman et al. (2006) found a 42% MSVT failure rate in adult independent medical evaluations, and Chafetz, Abrahams, and Kohlmaier (2007) found a 50% to 60% MSVT failure rate during adult and child Social Security Disability evaluations.

Recently, Carone (2008) administered the MSVT to a group of adult patients with mild traumatic brain/head injuries and contrasted their performance with a group of children with moderate-to-severe brain damage/dysfunction. At the end of the evaluation, patients were asked to rate the difficulty of the IR and DR subtests from 1 to 10 (with 10 being the most difficult). Whereas 21% of the adult patients failed the MSVT, only two of the children (5%) failed, and they were the only two who were clearly being uncooperative based on behavioral observations. The children outperformed the adults on all MSVT subtests and rated the task as much easier (difficulty rating of 1.35 versus 5.6).

The findings by Carone (2008) regarding the ease of the MSVT were also independently supported by Blaskewitz, Merten, and Kathmann (2008). In that study, the MSVT was administered to 73 children, ages 6 to 11. The results of the study showed that except for one child (who had an IR score just at the cutoff), all children passed the MSVT. Mean scores on the MSVT

effort subtests for second grade children were as follows: IR (97.3 ± 4.4), DR (99.5 ± 2.4), CNS (96.8 ± 6.1). These scores are very close to those obtained by Carone who reported the following in the aforementioned pediatric sample: IR (98.6 ± 3.7), DR (97.6 ± 6.3), CNS (96.7 ± 9.0). The results clearly show that that these subtests measure effort rather than ability in the vast majority of cases (see discussion on the severe impairment profile). Blaskewitz et al. also found that the MSVT is a useful measure to detect malingering in children, since children who were asked to malinger the evaluation performed well below established cutoffs, with the following MSVT scores noted: IR (58.4 ± 25.2), DR (59.5 ± 25.4), CNS (65.8 ± 16.9). The results from that study also show that child malingerers suppressed their scores on the harder subtests, with a mean PA score of 53.7 ($SD = 28.1$) and a mean FR score of 41.1 ($SD = 16$). These scores are far lower than those of the children with moderate-to-severe brain damage and neurological dysfunction in the study by Carone who reported a mean PA score of 93.7 ($SD = 16.3$) and a mean FR score of 67.6 ($SD = 20.8$).

These recent studies help to address an area of potential criticism that the MSVT had been open to previously. That is, some of the sample sizes in the manual were small and additional independent validation work was needed. At this point, there is now convergent evidence that the MSVT recognition tasks are very easy for those who put forth effort to do well and that the measures are able to detect patients who suppress their performance due to poor effort. The results from these and future validation studies should be incorporated into the MSVT computer program to add to the available comparison groups. In addition, it would be helpful if the MSVT computer program automatically performed a profile analysis to alert the test user as to the presence of a possible severe impairment profile. This is critical because it is very important to reduce the chance that clinicians will make false-positive decision errors regarding poor effort since some may not be aware of the need for profile analysis. Fortunately, the test author offers an Internet user group where clinicians can submit questions about particular cases. Although the MSVT has an oral version, there has yet to be a study to independently validate it. Despite this, some normative groups (Richman et al., 2006) contain subjects who were administered either the computerized or oral version of the MSVT.

Lastly, it bears repeating that the MSVT is a measure of effort and memory. It is not a direct measure of malingering. There are other explanations for poor effort besides malingering such as oppositional behavior due to not wanting to be tested. Nevertheless, the MSVT test manual presents data on multiple groups of simulating malingerers who were asked to fake memory impairment. One such group was derived from a study by Merten, Green, Henry, Blaskewitz, and Brockhaus (2005) and showed that all simulators failed the MSVT (100% sensitivity) and that the effort subtests were between 97% and 100% accurate in differentiating the simulating group from volunteers who were asked to try their best. Specificity rates in the study were 100% for the DR and CNS subtests and 94% for the IR subtests. In summary, the MSVT has high sensitivity and specificity in the evaluation of effort but should be used as a supplement rather than substitute for the WMT unless there are significant time demands present.

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