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Test of Memory Malingering and Word Memory Test: A new comparison of failure concordance rates

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Abstract

Two commonly used symptom validity tests are the Test of Memory Malingering (TOMM) and Word Memory Test (WMT). After examining TOMM–WMT failure concordance rates, Green [Green, P. (2007). Making comparisons between forced-choice effort tests. In K. B. Boone (Ed.), *Assessment of feigned cognitive impairment* (pp. 50–77). New York: Guilford] urged widespread adoption of the WMT, arguing the TOMM is insensitive to feigned impairment. But Green (2007) used a skewed concordance method that favored WMT (one TOMM subtest vs. three WMT subtests). In the present study we compare pass/fail agreement rates with different combinations of TOMM and WMT subtests in 473 persons seeking compensation for predominately mild neurological trauma. We replicated Green (2007) using his asymmetrical method, but otherwise we found the WMT and TOMM produce comparable failure rates in samples at-risk for exaggeration with balanced comparison (three TOMM subtests vs. three WMT). Further work is necessary to compare WMT and TOMM specificities, as failure concordance designs establish reliability but are insufficient for proving validity.

Keywords: Malingering; Postconcussion; Chronic pain; Validity testing; Test of Memory Malingering; Word Memory Test

Assessment of test-taking effort with symptom validity tests (SVTs) is a feature of modern neuropsychological testing (Boone, 2007; Larrabee, 2007). Neurological injury is a context where benefits can potentially be gained by feigning functional impairment. Financial incentive has proven association with outcome in remote head injury (Binder & Rohling, 1996; Rohling, Binder, & Langhinrichsen-Rohling, 1995) and chronic pain (Bianchini, Curtis, & Greve, 2006; Harris, Mulford, Solomon, van Gelder, & Young, 2005). Other justifications for SVT use include malingering base rates sufficiently high to justify validity testing in patients with ambiguous neurological injury (Greiffenstein & Baker, 2006; Greiffenstein, Baker, & Gola, 1994; Greve, Bianchini, Black, et al., 2006; Greve, Bianchini, & Doane, 2006; Larrabee, 2005; Mittenberg, Patton, Canyock, & Condit, 2002; Ord, Greve, Bianchini, & Curtis, 2007) and a professional consensus that adequate assessment of response validity is fundamental to neuropsychological assessment (Bush et al., 2005). However, sufficient justification for SVT use creates a new issue: Choice of particular SVT. There

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are many SVTs with variations in method (forced choice, level of performance) and stimulus content (verbal, pictorial) (Bianchini, Mathias, & Greve, 2001), including Test of Memory Malingering (TOMM; Tombaugh, 1995; Tombaugh, 2002), Word Memory Test (WMT; Green, Lees-Haley, & Allen, 2002), Victoria Symptom Validity Test (Slick, Hopp, Strauss, & Spellacy, 1996), Rey Fifteen Item Test (Frederick, 2003), and many others (Boone, 2007). There are too few comparative studies to guide choice.

One basis for choosing an SVT is concordance analysis, or comparison of sensitivities. Concordance means a comparison of agreement in pass/fail rates for two or more SVTs, while sensitivity means accuracy identifying persons known to have a trait or condition (Larrabee & Berry, 2007). In many studies, Paul Green and his colleagues compared WMT and other SVT pass/fail rates in neurological samples at-risk for exaggeration (Green & Flaro, 2003; Green & Iverson, 2001; Green, Iverson, & Allen, 1999; Green et al., 2002). Paul Green summarized his concordance research in a recent book chapter. Green (2007) reported that his at-risk (for exaggeration) sample failed the WMT roughly three times more often than the TOMM; he concluded that the WMT was more sensitive to malingering and should be the preferred and possibly the only SVT.

A critical reading of Green (2007) suggests a methodological limitation. Green calculated concordance by comparing failure rates on a single TOMM subtest (Trial 2) to failure rates on *any* of three simple WMT subtests (Immediate and Delayed Recognition, Consistency). Providing multiple opportunities to fail on one measure, but only a single opportunity to fail another, is a biased comparison. Any statistical outcome depends on number of opportunities; aggregated malingering indicators are more powerful predictors then any single indicator (Larrabee & Berry, 2007). In essence, the SVT comparison method used by Green (2007) may have biased the results in favor of the WMT.

We revisited the issue of TOMM/WMT failure concordance with new aggregation formats. Our goal was to examine the impact of symmetrical versus asymmetrical score aggregation on concordance rates. Using a large sample of persons seeking compensation for remote neurological trauma, we examined agreement rates in three formats: (a) Green's (2007) original asymmetrical aggregation (three WMT subtests versus one TOMM subtest), (b) a symmetrical method using all three TOMM subtests versus three WMT, and (c) reversed asymmetry potentially favoring the TOMM (all three TOMM subtests, one WMT subtest).

1. Methods

1.1. Participants

TOMM and WMT data were taken from the files of 473 persons referred for neuropsychological testing in Michigan (Greiffenstein and Baker) and Louisiana (Greve and Bianchini). All participants were seeking compensation for subjective disability (work, home, or school) blamed on remote neurological trauma (>6 months since injury) associated with either persistent cognitive or chronic pain complaints; most injuries were mild or ambiguous and not predictive of chronic disability, with more serious cases represented in the in the LA dataset. All data was archival but consecutive; referral sources included claims managers, physicians, and attorneys. The Glasgow Coma Scale (GCS), length of posttraumatic amnesia (PTA), radiographic findings (head CT/MRI/MRA), and initial neurological abnormalities were used to distinguish mild and serious initial injuries. The total sample was 90.5% comprised of persons with initial neurological trauma that was objectively mild and 9.5% comprised of quantitatively serious trauma.

The social and injury characteristics of the two samples and total sample are summarized in Table 1. The Michigan sample ($n = 136$) was comprised primarily of persons with persistent postconcussion syndrome (PPCS; $n = 127$), meaning polysymptomatic report long after minor head or neck trauma; their admission Glasgow Coma Scales (GCS) were 13–15 in the ER and PTA <30 m or no PTA at all. Nine persons sustained moderate-severe traumatic brain injury (M/S TBI) (admitting GCS was 3–12, PTA > 24 h, plus radiographic abnormalities). Using the same initial injury and duration criteria, the Louisiana sample ($n = 337$) was comprised of 21.7% ($n = 73$) patients with PPCS presentations after their mild injuries, 67.7% with chronic pain presentations after mild injury, and 10.7% with M/S TBI histories. The data of these 36 M/S TBI patients is also reported in a separate study (Greve, Ord, Curtis, Bianchini, & Brennan, 2007). The chronic pain group consisted of 228 persons claiming disabling pain and who were not claiming a head injury. Of the sample, 89% reported spine pain (neck or back) and 93% reported non-spine pain, usually involving the upper extremities (67%), less often the head, chest, or abdomen (33%). Approximately 1% had been diagnosed with fibromyalgia, myofascial pain syndrome, or complex regional pain syndrome. Half the patients (54%) had undergone surgery. Twenty-six percent had received a discectomy/fusion and 11% had a decompression/laminectomy. Seventeen