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The validity of the letter memory test as a measure of memory malingering: Robustness to coaching

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Abstract

The letter memory test (LMT) is a computerized forced-choice test of malingering detection including two face valid difficulty manipulations: increase in target stimulus length and increase of response foils. Prior research suggests the LMT shows promise as a malingering detection measure. In the present study, the utility of the LMT in the identification of malingering was further explored, using a counterbalanced design in a simulated malingering sample. Prior work was extended by assessing the robustness of the LMT to coaching and assessing the effectiveness of an additional scoring method, utilizing the face valid difficulty manipulations. Results were consistent with prior research on the LMT, with the standard cutoff score yielding high indices of accuracy. The LMT showed no order effects and was superior to the 15-item test in accuracy indices. Both the standard LMT score and the proposed score based on difficulty manipulations were relatively robust to coaching. Overall, findings indicate the LMT is a viable contender among measures of memory malingering.

Keywords: Letter memory test; Malingering sample; Forced-choice test

Malingering of cognitive impairment remains a significant problem in neuropsychological practice. The most popular malingering detection method in clinical practice is the forced-choice paradigm, in which a respondent with no exposure to the target stimulus has a 50% chance of accurately selecting it. However, as performance significantly below chance has poor sensitivity to malingering and multiple studies have demonstrated very high scores on forced-choice tasks, even in patients with severe memory impairment, most forced-choice measures have identified cutoff scores that are more sensitive to malingering, but still adequately specific. A number of forced-choice tests are available for use and vary slightly in terms of type of target stimulus presented, number of items, interval between stimulus and response choices and number of foils presented; generally these tests have yielded good indices of accuracy when comparing a variety of different groups (Inman & Berry, 2002; Orey, Cragar, & Berry, 2000; Strauss et al., 2002; Tan, Slick, Strauss, & Hultsch, 2002; Vickery, Berry, Inman, Harris, & Orey, 2001). A recent addition to malingering detection research is the letter memory test (LMT: Inman et al., 1998). The LMT presents stimuli synthesized from the first 10 consonants of the alphabet. Each target stimulus is presented for 5 s, followed by a 5 s delay. The examinee is then presented with the target stimulus and one or more foils. Stimulus length varies from 3, 4 or 5 letters and response foils vary from 1, 2 or 3 options in addition to the target stimulus. The increase in target stimuli length and number of foils were meant

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to counteract subject identification of the difficulty level for each item, which may lead examinees to perform more poorly on items that superficially appear more difficult. Inman and Berry (2002) found that an LMT cutoff score of cutoff score of <93% correct resulted in 100% specificity, 73% sensitivity and 87% overall hit rate; in comparison to the digit memory test, the LMT provided a higher sensitivity rate. Using the same cutoff, Orey et al. (2000) yielded a sensitivity of 58% and a specificity of 100%; in comparison to the digit memory test, Portland digit recognition test and LMT, the researchers found the LMT to have the highest sensitivity. To our knowledge, the LMT has only been examined by its authors. Given this, the LMT warrants further study by an independent research laboratory. One major purpose of the present study was to provide further information on the effectiveness of the LMT in malingering detection.

A second purpose of the present study was to explore the effects of coaching on the effectiveness of the LMT. There is growing recognition of the potential problems associated with coached malingering. Recent research shows that even very subtle coaching can alter performance on cognitive tests, including tests of malingering, increasing the chance of escaping detection (Gunstad & Suhr, 2001; Hiscock, Branham, & Hiscock, 1994; Martin, Bolter, Todd, & Gouvier, 1993; Martin, Gouvier, Todd, & Bolter, 1992; Rose, Hall, & Szalda-Petree, 1995; Rose, Hall, Szalda-Petree, & Bach, 1998). The effects of coaching on non-forced-choice methods of detection suggest that these measures, which usually analyze patterns of performance across multiple tests or subtests, may be more robust to the effects of coaching (Coleman, Rapport, Millis, Rickert, & Farchione, 1988; DiCarlo, Gfeller, & Oliveri, 2000; Hiscock, Branham, & Hiscock, 1994; Kurtz, White, Hornung, & Belknap, 1999; Rapport, Farchione, Coleman, & Axelrod, 1998; Suhr & Gunstad, 2000; Suhr, Gunstad, Greub, & Barrash, 2004). The results of such studies suggest that developers of malingering instruments should begin to include analysis of more complex patterns of responding to the test. Although the LMT is fundamentally a forced-choice assessment that utilizes a cutoff score in the assessment of malingering, meaningful patterns of performance that include subtle features typically unattended to by the malingerer may also be examined. For example, Inman et al. (1998) found that neurological patients with no known motivation to malinger, demonstrated no significant changes in performance across the blocks of trials on the LMT, while naïve simulators, coached simulators and patients with suspected motivation demonstrated clear declines in performance as the task appeared to be more difficult, indicating that there may be value in using patterns of performance on the LMT to detect malingering. Thus, in the present study, we examined the robustness of the LMT to coached malingering, looking at the effects of coaching on both the overall score and on patterns of performance across its difficulty levels.

1. Method

1.1. Participants

Participants were introductory psychology students at a medium-sized midwestern university who participated in a mass screening process in which they voluntarily completed a packet of questionnaires, including one assessing history of head injury. A random selection of individuals who reported a history of head injury ($n = 79$) and who reported no history of head injury ($n = 28$) based on the screen were contacted by phone or electronic mail and invited to participate. Inclusion criteria for the head injury group included a self-reported history of mild head injury/concussion accompanied by a loss of consciousness of at least 1 min but no more than 20 min. Participants in either group who reported current psychological problems, drug or alcohol abuse, a history of learning disability and/or other significant neurological history were not included in the study.

1.2. Procedure

After completing consent, each participant with a history of head injury was quasi-randomly assigned to simulate head injury (with or without malingering detection warning) or to give their best effort on tests. For quasi-randomization, envelopes containing the different instructions were randomly intermixed by shuffling them together and having the examiner select an envelope. Near completion of the study, only certain experimental conditions were yet to be completed to satisfy chosen sample size. Therefore, not all sets of instructions were being randomly mixed in and thus true randomization did not occur for the full set of participants with history of head injury. The entire non-head injury group was instructed to perform with their best effort.