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The vulnerability to coaching across measures of malingering

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THE VULNERABILITY TO COACHING ACROSS MEASURES OF MALINGERING

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Abstract

Neuropsychologists are increasingly called upon to conduct evaluations with individuals involved in personal injury litigation. While the inclusion of malingering measures within a test battery may help clinicians determine whether a client has put forth full effort, attorney coaching may allow dishonest clients to circumvent these efforts. The purpose of this study was to determine the degree to which frequently used measures of effort are susceptible to coaching as well as to explore and classify strategies undertaken by coached analogue malingerers. Additionally, potential improvements in the external validity of the simulation design were explored.

Introduction

Approximately 94% of neuropsychologists in private practice report involvement in personal injury evaluations of brain-injury cases (Essig, Mittenberg, Petersen, Strauman, & Cooper, 2001). During these personal injury evaluations, the neuropsychologist evaluates cognitive functioning across a wide domain of abilities; however, before making a conclusion of compromised functioning secondary to injury, the neuropsychologist must ensure that the patient has put forth his or her best effort towards the testing procedures (Iverson, 2003). The fabrication or exaggeration of cognitive impairment in the presence of some incentive (i.e., financial compensation) is particularly germane to the forensic examiner as malingering is an increasingly costly issue. Malingering accounts for nearly one-fifth of all medical care cases (i.e., doctor visits, hospitalizations) within the United States and combined medical and legal costs approach five billion dollars annually (Ford, 1983; Gouvier, Lees-Haley, & Hammer, 2003).

Estimated baserates of malingering range from approximately 18% to 33% of litigating populations (Binder, 1993; Heaton, Smith, Lehman, & Vogt, 1978; Mittenberg, Patton, Canyock, & Condit, 2002), therefore the need for accurate detection methods is clear. To respond to this need, numerous malingering detection techniques have been developed. A recent survey revealed that 79% of neuropsychologists involved in personal injury cases incorporate techniques and methods designed to detect malingering into their neuropsychological battery (Slick, Tan, Strauss, & Hultsch, 2004). Some of the most frequently employed techniques include symptom validity testing, examination of the performance curve, examination of floor effects, recognition of atypical performances, and the use of validity indices.

Malingering Detection Methods

Symptom Validity Testing

Symptom validity tests (SVT) allow a clinician to infer a patient's intent to deceive (Bianchini, Mathias, & Greve, 2001). Within a SVT, a specific ability is assessed by a large number of items presented in multiple-choice format (Rogers, 1997). The patient's performance is then compared to the likelihood of success based on chance alone. For example, on a measure that consists of two items from which the patient must choose, the patient could theoretically answer 50% of the items correctly based on chance alone (Haines & Norris, 1995). The assumption behind forced-choice measures is that if a subject scores significantly below chance at a $p \leq .05$ level, there is the presence of purposive distortion, that is, the patient deliberately chose to respond with the incorrect answer (Reynolds, 1998).

Numerous variations of the SVT technique have been developed to increase parameters of sensitivity and specificity to malingering detection, but no approach has proven successful at doing both simultaneously. Within the context of malingering detection, a measure's sensitivity refers to its ability to recognize malingering in individuals who actually *are* malingering and specificity is the ability of the test to render a negative finding in individuals who *are not* malingering. Utilization of a cutoff score is one way to improve a measure's sensitivity; however, at the cost of reduced specificity. A cutoff score represents the lowest score achieved by an individual with documented brain dysfunction who has no financial incentive to perform poorly. Therefore, if a patient with minor, or no documented brain-injury performs significantly worse than this cutoff score, malingering should be suspected (Haines & Norris, 1995). The addition of cutoff scores to the SVT paradigm made it so that it was no longer necessary to rely on scores significantly below chance to indicate poor motivation, now less extreme scores could be used, thus improving the sensitivity of this method (Rogers, 1997).

There are numerous tests employing the SVT technique, each with varying stimulus presentations and organizations. For example, The Test of Memory Malingering (TOMM), the most frequently used SVT among practicing clinicians, utilizes a visual presentation with the intent of tapping into malingered memory difficulties (Slick et al., 2004; Tombaugh, 1997). Published psychometric properties of this test with coached simulator samples include 100% specificity and sensitivity rates when using an empirically derived cutoff score of less than 45, and 100% specificity and 40% sensitivity when using below chance performance of less than 18 (Tombaugh, 1997). The Portland Digit Recognition Test (PDRT), another SVT, employs a visual recognition task where a respondent is asked to remember a five-digit number. Respondents to this measure generally perceive that the measure's difficulty varies as a function of an incorporated distractor task. Perceived task difficulty has been associated with increased symptom exaggeration among malingerers. Published sensitivities of the PDRT range from 15% when using an empirically derived cutoff score of less than 19 for "easy" items, to 26% for a cutoff score of less than 18 for "hard" items, and to 30% for a cutoff score of less than 39 for "easy" and "hard" items combined. The specificity when using these cutoff scores remained strong at 100% across all three indices (Binder, 1993).

Computerized tests employing the SVT technique are also available. For example, the Computerized Assessment of Response Bias (CARB) is a measure that is gaining increased use among neuropsychologists (Slick et al., 2004). Published reports of the CARB indicate an 87.2% correct classification rate in analogue malingerers (Allen, Iverson, & Green, 2002). In addition, reports on The Word Memory Test (WMT), another computerized test with a SVT component, indicate that this measure has the strongest sensitivity and specificity of all computerized malingering tests, at 97.7% and 100% respectively (Green, Lees-Haley, & Allen, 2002); however, some dispute these numbers citing inflation due to a large proportion of defense referrals within the sample (Bigler, 2006).

Performance Curve

Another technique frequently used in the assessment of effort is the performance curve. The performance curve compares the probability of correctly answering easy items versus more difficult items (Rogers, 1997). In individuals who are providing full effort, the clinician should expect to see a decrease in correct responding as task difficulty increases. Evidence has shown that simulated malingerers do not generate the typical performance curve, that is they fail a "more-than-expected" proportion of easy items compared to their performance on more difficult items (Frederick & Foster, 1991).

A measure that relies on the performance curve is the Dot Counting Test (DCT). This measure presents stimuli of varying (and mixed up) difficulty levels to determine the consistency of an individual's response time and error-rate (Lezak, 1995). In non-malingering subjects, typically no errors are committed and a positive correlation is observed between difficulty level and time to respond. If there is more than one pronounced discrepancy between the expected and observed patterns of response time and/or if more than 2 errors are made, malingering should be suspected. Overall, empirical evidence supports error-rate as the stronger indicator of malingering (Frederick, 2002; Binks, Gouvier, & Waters, 1996).

Floor Effects

There are many problems and tasks that are easily accomplished by most individuals, including those with brain damage. Malingering detection utilizes this knowledge by examining floor effects. Floor effects are extremely low performances observed when malingerers misjudge the difficulty of easy tasks and perform more poorly than brain-damaged patients (Millis & Kler, 1995). A drawback to this method, however, is that it is sensitive to true memory impairment and correlates considerably with measures of cognitive competence (Vallabhajosula, & van Gorp, 2001; Lezak, 1995).

The Rey-Fifteen Item Memory Test (MFIT) is a commonly used measure that utilizes the floor effect (Frederick, 2002). This measure is sensitive to true memory impairment; therefore, the cutoff score is not fixed. For comparison to non-clinical and psychiatric populations a cutoff score of 9 provides appropriate predictive accuracy; however, if a differential diagnosis of amnesia or dementia is suspected, a cutoff score of 7 should be used (Goldberg & Miller, 1986; Bernard & Fowler, 1990; Frederick, Sarfarty, Johnston, & Powel, 1994; Lezak, 1983; Lee, Loring, & Martin, 1992).

Atypical Test Performance

Test performance that is markedly discrepant from accepted models of normal and abnormal brain functioning alert the clinician to the possibility of exaggerated deficits. For example, it is well documented that implicit memory is preserved following even the most severe brain-injuries (Kuzis, Sabe, Tiberti, Merello, Leiguarda, & Starkstein, 1999). The theory behind this method is that the automatic and intentional uses of memory can be separated, and that "conscious control can be measured as the difference between performance when a person is trying *to* as compared with trying *not to* use information from some particular source" (Jacoby, 1991 p. 527). Therefore, any impairment on measures of implicit learning may be indicative of malingering. A measure that utilizes this concept is the Word Completion Memory Test (WCMT; Hilsabeck, LeCompte, Marks, & Grafman, 2001). When using cutoff scores of less than 15 on the Inclusion subtest and a cutoff score of less than 9 for the difference between the Inclusion and Exclusion subtests, the WCMT correctly classifies 97% of malingerers (Hilsabeck et al., 2001).

Validity Indices

Many self-report measures of psychological functioning contain validity scales meant to detect if respondents are answering in a manner that invalidates the overall results. More specifically, these scales can indicate the direction of invalidation. For example, the Minnesota Multiphasic Personality Inventory-2 (MMPI-2) has at least two indices that can be used for malingering detection. The F or "infrequency" scale measures the extent to which a person answers in an atypical and deviant manner. A score of 70 or above is suggestive of possible malingering. The Dissimulation or F-K index determines the likelihood and direction of exaggeration. A score of 12 or greater indicates a fake bad profile, while a score of -12 or less indicates a fake good profile (Groth-Marnat, 1997). Similarly, the Personality Assessment Inventory (PAI) contains scales appropriate for use in malingering detection. The strongest indicator is the Negative Impression Management (NIM) scale that measures the degree to which an individual presented an exaggerated, unfavorable impression of distress. A score of 92 or greater is indicative of possible malingering (Morey, 2003).

Overall Classification of Malingered Performance

While failure on one or more measures of effort may alert the clinician to possible malingering, one must be cautious when declaring a patient as a malingerer. In fact, 41.7% of surveyed neuropsychologists reported only rarely using the term "malinger" in their reports (Slick et al., 2004). Numerous reasons for this hesitation exist, including the fear of mislabeling someone, the likelihood of being threatened, or the possibility of being sued (Iverson, 2003). Regardless of the reason, it has been recommended that the clinician employ a more systematic evaluation of malingering to ensure correct classification and to meet the stringent standards of evidence offered by *Daubert*.

The most thorough and systematic evaluation in the assessment of malingering comes from Slick, Sherman, and Iverson (1999). Slick et al. (1999) defined malingering as "…the volitional exaggeration or fabrication of cognitive dysfunction for the purpose of obtaining substantial material gain, or avoiding or escaping formal duty or responsibility." (p. 552). Furthermore, the authors describe three categories of malingering, namely *possible, probable*, and *definite*, based on performance across different measures and techniques designed to detect malingering. For a patient to classify into one of these categories some combination of four criteria is to be met. The four criteria are:

Criterion A: Presence of a substantial external incentive - at least one clearly identifiable and substantial external incentive is present at the time of examination.

Criterion B: Evidence from neuropsychological testing - evidence of exaggeration or fabrication on neuropsychological tests as evidenced from at least one of the following:

1.) Definite response bias - below chance performance ($p<.05$) on one or more forced-choice measures.
2.) Probable response bias - performance on a well-validated test or index is consistent with fabrication or exaggeration.
3.) Discrepancy between test data and known patterns of brain functioning.
4.) Discrepancy between test data and observed behavior.
5.) Discrepancy between test data and reliable collateral reports.
6.) Discrepancy between test data and documented background history.

Criterion C: Evidence from self-report - significant inconsistencies or discrepancies in a patient's self-reported symptoms that suggest fabrication or exaggeration as evidenced by one of the following:

1.) Self-reported history is discrepant with documented history.
2.) Self-reported symptoms are discrepant with known patterns of brain functioning.
3.) Self-reported symptoms are discrepant with behavioral observations.
4.) Self-reported symptoms are discrepant with information obtained from collateral informants.

5.) Evidence of exaggerated or fabricated psychological dysfunction - performance on well-validated validity scales or indices on self-report measures of psychological adjustment are strongly suggestive of exaggeration or fabrication.

Criterion D: Behaviors meeting necessary criteria from groups B or C are not fully accounted for by Psychiatric, Neurological, or Developmental Factors - behaviors are the product of an informed, rational, and volitional effort aimed at least in part toward acquiring or achieving external incentives.

To qualify as a *definite* malingerer, the patient must meet criteria A, B1, and D; meaning there must be substantial external incentive, the presence of a definite negative response bias on neuropsychological test(s), and no psychiatric, neurological, or developmental factor that would significantly diminish one's capacity to appreciate laws or mores against malingering.

To qualify as a *probable* malingerer, the patient must meet criterion A, two or more from B1-B6, and D, or criterion A, one from B1-B6, one from C1-C5, and D. Therefore, a patient can classify as a *probable* malingerer in two ways, by having the presence of external incentive, two pieces of evidence from neuropsychological testing, and no psychiatric, neurological, or developmental disorder, or by having external incentive, one piece of evidence from neuropsychological testing, one piece of evidence from self-report, and no psychiatric, neurological, or developmental disorder.

There are also two ways in which a patient can qualify as a *possible* malingerer, the patient must either meet criterion A, one from C1-C5, and D, (external incentive, evidence from self-report, and no psychiatric, neurological, or developmental disorder) or must meet criteria that would classify him/her as a *definite* or *probable* malingerer with the exception of criterion D. See Table 1.

Malingering Strategies and Attorney Coaching

Few studies have looked at malingering strategies in individuals asked to perform as if they were head-injured. Of the strategies reported in analogue malingerers, the most frequently used approach is to feign total memory loss (76%), followed by feigning a slow rate of response speed (32%), confusion (16%), and concentration difficulty (12%) (Tan, Slick, Strauss, & Hultsch, 2002). Importantly, however, these strategies were observed in individuals naïve to the effects of head-injury and/or the likelihood of detection by effort measures. It is likely that these approaches may be different in "real-world" malingerers as individuals involved in personal injury litigation may be coached by their attorneys on the sequelae of brain damage and also in ways to avoid detection. Elucidating the strategies employed by coached malingerers may help to inform the clinician about possible methods in which coached malingerers attempt to avoid detection.

Approximately 75% of attorneys recently surveyed reported preparing their clients for forensic neuropsychological evaluations by discussing the content and purpose of neuropsychological tests and measures (Essig et al., 2001). Furthermore, there is evidence that attorneys brief their clients on the inclusion of measures designed to detect malingering. The most frequently reviewed test is the MMPI-2 (29%), followed by the PDRT (6%), and the MFIT(2%). In addition to direct warnings of neuropsychological and effort measures, approximately 10% of attorneys inform their clients of what types of information to disclose concerning their injury and 12% tell their clients what

Table 1

Criteria and Classification of Malingered Neurocognitive Dysfunction of Slick, Sherman, & Iverson (1999).

Criterion A: Presence of a Substantial External Incentive
Criterion B: Evidence from Neuropsychological Testing
Criterion C: Evidence from Self-Report
Criterion D: Behaviors are not fully accounted for by Psychiatric, Neurological, or Developmental Factors

Classification	Criterion A	Criterion B	Criterion C	Criterion D
Definite malingering	X	X*	(X)	X
Probable malingering	X	X (two pieces)		X
Or				
Probable Malingering	X	X (one piece)	X (one piece)	X
Possible Malingering	X		X	X

*Must Include Definite Negative Response Bias information not to disclose (Essig et al., 2001). The influence of attorney coaching on neuropsychological performance and malingering detection measures is likely to influence and invalidate the standard neuropsychological assessment.

Recent studies have examined the susceptibility of effort measures to attorney coaching; however, the results have generally been mixed. For example, Suhr and Gunstad (2000) reported that providing simulated malingerers with brain-injury information had no effect on their performance on the Auditory Verbal Learning Test. Similarly, a computerized version of the PDRT was found to be resilient to coaching (Rose, Hall, Szalda-Petreem, & Bach, 1998). The WCMT was also found to be invulnerable to the effects of coaching; however, this measure was designed specifically against coaching effects (Hilsabeck et al., 2001).

In contrast, others have reported on the vulnerability to coaching of many measures of effort. Lamb, Berry, Wetter, and Baer (1994) demonstrated the susceptibility of the MMPI-2 to both coaching and brain-injury information. Simulated malingerers, who were provided with information regarding brain-injury and/or information regarding the ability of the MMPI-2 to detect a "fake-bad" profile, produced valid profiles with significantly elevated clinical scales similar to those obtained by individuals with true head injuries. In addition, Martin, Bolter, Todd, and Gouvier (1993) reported that analogue malingerers were able to produce more believable profiles on a computerized forced-choice measure after being provided with information regarding dissimulation. More believable profiles were also observed on the CARB and WMT after participants were provided with information on how to beat these measures (Dunn, Shear, Howe, & Ris, 2003). Similar results were observed on the Nonverbal Forced

Choice Test, 21-Item Test, DCT, MFIT, PDRT, and Recognition Memory Test (Rose et al., 1998; Cato, Brewster, Ryan, & Guiliano, 2002; Gunstad & Suhr, 2001; Martin, Hayes, & Gouvier, 1996).

Although numerous studies have examined the vulnerability of effort measures to coaching, no study has compared frequently used measures of malingering against one another to determine which are relatively more or less vulnerable to coaching. In addition, no study to date, has examined the profile of malingering strategies utilized by individuals who have been coached. The purpose of this study is to determine which commonly used measures of effort are most susceptible to the effects of coaching as well as to determine what malingering strategies are most frequently employed by individuals who are coached. However, before these questions can be answered, methodological issues in malingering research must be addressed.

<u>Methodological Issues in Malingering Research</u>

The vast majority of malingering research is based on the simulation design. This design utilizes non-clinical subjects, typically university undergraduates, asked to feign brain damage. Although one recent study (Brennan & Gouvier, 2006) has shown that simulated malingerers are comparable to actual malingerers, studies utilizing the simulation design have historically been criticized for their lack of generalizability to actual malingerers. A particular concern of the simulation design is that the individuals employed have little to no experience regarding head-injury. This is considerably different from individuals involved in actual litigation. Often times, litigants who are malingering may have experienced and recovered from a mild head-injury; however, they choose to perform during the neuropsychological evaluation as if their deficits were still present (Rogers, 1997). It is possible that the prior experience of an actual head-injury allows the litigant to malinger in a more convincing manner (Cato et al., 2002). Past research has demonstrated that simulated malingerers with a history of head-injury perform differently than simulators without the history of a head-injury, although experience with head-injury does not reliably reduce misconceptions about head-injury, still leaving the once-injured malingerer vulnerable to detection (Ju & Varney, 2000; Martin, Hayes, & Gouvier, 1995).

Purpose of Study

The purpose of this study is to determine which commonly used measures of effort are most susceptible to the effects of coaching as well as to determine what malingering strategies are most frequently employed by individuals who are coached on a variety of brain injury sequelae. Before these questions can be answered, methodological issues in malingering research are addressed.

Research Questions and Hypotheses

Question 1

Several tests and measures have been developed to detect malingering. Which commonly used measures of malingering are most susceptible to coaching?

Hypothesis 1: It predicted that providing participants with information regarding a test's ability to detect malingering as well as information regarding brain-injury sequelae will lessen the severity of performance failures on the TOMM, PDRT, WMT, DCT, MFIT, and PAI. Furthermore, it is predicted that the influence of coaching will be observed through increased failure rates on the WCMT.

Question 2

Malingering strategies in uncoached simulated malingerers have been well documented (Tan et al., 2002). What strategies do coached simulators commonly employ?

Hypothesis 2: It is predicted that strategies employed by uncoached simulated malingerers will be significantly different from strategies employed by coached simulated malingerers.

Question 3

Are individuals with a history of head-injury better able to simulate brain damage compared to individuals without a history of head-injury?

Hypothesis 3: It is predicted that less severe performance failures will be observed in simulated malingerers with a history of head-injury compared to individuals without a history of head-injury.

Method

Participants

A power analysis was performed to determine the number of subjects needed for power = .80 and alpha = .05. A large effect size was consistently observed in reviews of the literature on differences between coached and uncoached simulators and therefore, a large effect size was assumed to occur in this study. Using an effect size of 1.25σ, 20 subjects per group were estimated to yield enough power to find a true difference if one really exists (Cato et al., 2002; Gunstad & Suhr, 2001); however, data was collected from substantially more participants yielding a total sample size of 131.

Participants were 131 undergraduate students attending Louisiana State University in Baton Rouge, Louisiana. Participation was on a volunteer basis with six extra credit points awarded for participation. All participants were recruited from undergraduate courses and were randomly assigned to received coached instructions or uncoached instructions. The distribution of participants in each group was as follows: Coached & History of Head Injury (C/HI): n = 20; Coached & No History of Head Injury (C/NHI): n = 41; Not Coached & History of Head Injury (NC/HI): n = 20; Not Coached and No History of Head Injury (NC/NHI): n = 50. Individuals were assigned to the HI group if they had endorsed experiencing a concussion or any loss of consciousness in their initial interview.

The entire sample was composed of 47 males and 84 females. The average age of the sample was 20.90 years (*SD* = 3.45) and the average level of education was 13.40 years (*SD* = 2.68). The sample was 80.9% Caucasian, 16% African-American, .8% Hispanic, 1.5% Asian, and .8% of the sample described their race as “other.” No significant differences were observed between the C and NC groups on variables of age [(C: $M = 20.64$, $SD = 2.46$; UC: $M = 21.13$, $SD = 4.13$) $t\,(129) = -.80$, $p = .42$], educational level [(C: $M = 13.84$, $SD = 1.26$; UC: $M = 13.03$, $SD = 3.44$) $t\,(89.23) = 1.83$, $p = .071$], ethnicity [(C: 80.3% Caucasian, 16.4% African-American, 1.6% Hispanic, and 1.6% Asian; UC: 81.4% Caucasian, 15.7% African-American, and 2.9% Other) $U = 2110.50$, $p = .86$], or gender [(C: 41% male; UC: 31.4% male) $U = 1931.00$, $p = .25$]. Similarly, no significant differences were observed between the HI and NHI groups on age [(HI: $M = 21.25$, $SD = 3.85$; NHI: $M = 20.75$, $SD = 3.27$) $t\,(129) = .76$, $p = .44$], educational level [(HI: $M = 13.20$, $SD = 3.24$; NHI: $M = 13.49$, $SD = 2.41$) $t\,(129) = -.57$, $p = .56$], ethnicity [(HI: 75.0% Caucasian, 17.5% African-American, 2.5% Hispanic, and 2.5% Asian; NHI: 83.5% Caucasian, 15.4% African-American, and 1.1% Other) $U = 1647.50$, $p = .20$], or gender [(HI: 47.5% male; NHI: 30.8% male) $U = 1515.50$, $p = .06$]. See Table 2.

Materials

Written informed consent was obtained from all participants prior to their inclusion in the study. The following tests were administered:

Structured Clinical Interview

A structured clinical interview was developed to obtain the following information from participants: age, gender, race, education, neurological history, history of head-injury, litigation history, and psychological history. See Appendix A.

Table 2

Demographic Information Across Groups.

	Mean	Standard Deviation
Coached/Head-Injury		
Age	20.80	2.69
Education	13.70	1.08
Coached/No Head Injury		
Age	20.56	2.37
Education	13.90	1.34
Uncoached/Head Injury		
Age	21.70	4.78
Education	12.70	4.45
Uncoached/No Head Injury		
Age	20.90	3.87
Education	13.16	2.99

All Numbers Are Reported in Years

Test of Memory Malingering (TOMM)

The TOMM consists of two learning trials and a retention trial. The two learning trials each consist of two phases, a study phase and a test phase. The study portion of each trial contains 50 pictures presented one at a time for three seconds each. During the test portion, the participant must decide between two pictures, one of which he previously studied. Following a 20 minute delay, the retention trial is administered. The retention trial only consists of the test phase. A score of one point is credited for every correct answer. The TOMM was administered according to manualized instructions (Tombaugh, 1996).

Portland Digit Recognition Test (PDRT)

During the PDRT, the examinee reads aloud a five-digit number string. After a delay, the participant must visually choose, between two five-digit number strings, which number was originally presented. This test is composed of easy items and hard items. During the easy items, the participant is asked to count aloud for five seconds during the delay for the first 18 items, and then the delay is increased to 10 seconds for the second presentation of 18 items. For the hard items, the participant is requested to count aloud for 30 seconds for two trials of 18 items. The PDRT was administered according to manualized instructions. See Appendix B.

Word Memory Test (WMT)

The WMT is a computer-administered test. Instructions are presented on the computer, prior to administration of the test. A 20-item word list is presented. The words appear in pairs, with one word presented, followed by its pair one second later. The pair disappears and another set is presented two seconds later. The entire word list is presented twice and then the participant is asked to recall as many of the word pairs as possible (Green et al., 2002). The WMT provides three measures of effort. The first measure is the immediate recognition trial (IR), where the subject is required to choose a word from the original list in each of 40 new word pairs. Following a 30-minute delay, the delayed recognition trial (DR) is administered. It is nearly identical to the immediate recognition trial, except different foil words are presented. A consistency score (CNS) is calculated based on performances on the IR and DR trials.

Memory for Fifteen Items Test (MFIT)

The MFIT consists of 15 items that are arranged in three columns by five rows. Participants are shown a card containing 15 items for a 10 second duration. Following the 10 seconds, the card is removed and participants are asked to reproduce the 15 items from memory. One point is awarded for each item correctly reproduced. The MFIT was administered according to manualized instructions (Lezak, 1995). See Appendix C.

Dot Counting Test (DCT)

The DCT consists of twelve cards with grouped and ungrouped dots printed on 3 x 5 cards. The participant is told to count the dots as quickly as possible. Response times are compared to response times of samples of normal subjects and samples of brain-injured patients. The DCT was administered according to manualized instructions (Lezak, 1995). See

Appendix D.

Word Completion Memory Test (WCMT)

The WCMT consists of two subtests, Inclusion and Exclusion. During the Inclusion subtest, 30 words are read aloud to the participant and the participant is asked to copy down the word and rate its pleasantness. Following this, the participant is asked to complete 30 word stems using words from the previous list. During the Exclusion subtest the patient copies and rates a second list of 30 words. The participant is then asked to complete 30 word stems using words that were not on the list. Performance on this test yields an I-score, which is the number of stems completed with words from the Inclusion list, an E-score, which is number of stems completed from words on the Exclusion list, and a R-score, which is the difference between the I and E scores.

Personality Assessment Inventory (PAI)

The PAI consists of 344 statements on which a participant can answer as *False*, *Slightly True*, *Mainly True*, or *Very True*. The completed form is entered into a computerized scoring program that provides a printout containing scores on 4 validity scales and 9 clinical scales.

Wide Range Achievement Test- Third Edition (WRAT-3)

The reading subtest of WRAT-3 was administered to all participants to ensure at least a fourth grade reading level as required by the PAI.

Strategy Questionnaire

A questionnaire assessing the kind of strategies used by participants was rationally derived for this study using the published findings of Tan et al (2002). This questionnaire is comprised of questions regarding preparation for the experiment, strategy management, and perception of the face validity of each measure. This measure was read by the examiner with the test materials were represented so that the participant could properly rank the measures on the questionnaire. See Appendix E.

Subject Rating Scale

A subject rating scale, taken directly from Tombaugh (1996), asked the questions: How successful do you think you were in your attempt to portray someone with a brain-injury? How hard did you try? Subjects rate their answers on a 6 point Likert scale. This measure was administered to control for those participants who reportedly did not try. One participant was excluded from analyses for reporting on this measure that he did not try. See Appendix F.

Design and Procedure

This study occurred over two sessions. During the first session, informed consent was obtained and the participant was interviewed using the structured clinical interview designed for this study. Participants were then randomly assigned to the C or NC group as well as assigned an identification number to maintain anonymity of all responses. All participants were read a set of instructions modified from Gunstad and Suhr (2001) and Cato et al. (2002). Instructions were as follows:

> Imagine that you were in a car accident in which another driver hit your car. You were knocked unconscious and woke up in the hospital. You were kept overnight for observation. The doctors told you that you experienced a concussion. Imagine that a year after the accident, you are involved in a lawsuit against the driver of the other car. If you are found to have experienced significant injuries as a result of the accident, you are likely to receive a bigger settlement. You have decided to fake or exaggerate symptoms of a brain-injury in order to increase the settlement you will receive. As a part of the lawsuit, you are required to undergo cognitive testing to determine whether or not you have experienced a brain-injury. If you can successfully convince the examiner that you have experienced

> significant brain damage, you are likely to get a better settlement. If the examiner detects that you are faking, you are likely to lose the lawsuit.
>
> In one week you will take a series of cognitive tests that will be used in such a situation. I would like you to spend some time over the next week researching and developing your role as an individual with brain damage. On the tests you will take next week, I would like you to simulate brain damage, but in a believable way, such that the examiner cannot tell that you are attempting to fake a brain-injury.

Individuals assigned to the C group were read a second set of instructions which outlined multiple outcomes following brain-injury as well as the ability of some measures to detect malingering. Instructions were as follows:

> I will read a list to you of commonly experienced problems following a head-injury, which may help in your simulation of head-injury. These symptoms include: frequent headaches, being easily fatigued, problems with memory, difficulty attending and concentrating, slowed responses, irritability, anxiety, and depression.
>
> Another piece of information that may help you in your simulation of head-injury is that some of the tests you will be given are designed to detect is someone is faking. Your best chance of performing successfully will be to miss more of the difficult items that the easy ones and be sure not to miss more than half of the questions.

Participants were then scheduled to undergo testing the following week. The average length of time between Session 1 and 2 was 9.13 days (*SD* = 3.01). There was no significant difference in length of time between sessions across the four groups, F (3, 68) = .60), p = .61. Fifty-four students who completed Session 1 did not return for Session 2 and were therefore excluded from the study, leaving a total sample size of 131.

During Session 2, the examiner reread the instructions presented during the first session. Participants were then administered the two learning trials of the TOMM. During the delay, the MFIT and DCT were administered. Following the administration of the DCT, the retention trial of the TOMM was administered. Once the retention trial on the TOMM was complete, the PDRT and the WMT were administered. During the WMT delay, participants were given an opportunity to take a break. Following the completion of the WMT, participants were administered the WCMT, WRAT3, and PAI. Participants were then asked to complete the strategy questionnaire and subject rating scale. Participants were then provided with an extra credit slip and dismissed.

Results

Data Analysis

A 2 x 2 between subjects MANOVA was used to test Hypotheses 1 and 3. In Hypothesis 1, it was predicted that performance failures of lesser severity would be observed in coached participants compared to uncoached participants on all measures except for the WCMT (in which case increased failure rates were predicted). In Hypothesis 3, it was predicted that performance failures of lesser severity would be observed in simulated malingerers with a history of head-injury compared to simulators without a history of head-injury. Significance was considered at the $p \leq .05$ level. The independent variable was group classification (C versus NC and HI versus NHI) and the dependent variables were performance on 14 indices of effort derived from 7 measures, namely the TOMM Trial 1, TOMM Trial 2, TOMM Retention Trial, PDRT Easy, PDRT Hard, PDRT Total, WMT IR, WMT DR, WMT CNS, DCT errors, MFIT total, PAI NIM, WCMT I, and WCMT R.

Results for Hypothesis 1 demonstrate a significant main effect for the presence of coached instructions, meaning that there was a significant difference in the scores of participants who received coached instructions versus participants who did not, F (14, 82) = 1.788, $p \leq .05$. In contrast, no significant main effect was found for Hypothesis 3, meaning that participants with a history of head-injury did not perform significantly different than participants with no history of head-injury, F (14, 82) = .74, p = .72. Similarly, there was no significant interaction effect for history of head-injury and coached instructions, F (14, 82) = .40, p = .96.

Results of Bonnferoni post-hoc tests reveal significant differences between the C and NC groups on the TOMM Trial 1: F (1, 95) = 17.16, $p \leq .05$; TOMM Trial 2: F (1, 95) = 11.29, $p \leq .05$; TOMM Retention Trial: F (1, 95) = 12.21, $p \leq .05$; PDRT Total: F (1, 95) = 3.84, $p \leq .05$; WMT DR: F (1, 95) = 10.43, $p \leq .05$; WCMT I: F (1, 95) = 8.63, $p \leq .05$; and WCMT R: F (1, 95) = 4.08, $p \leq .05$ See Table 3. All significant differences were directional, with the C group demonstrating significantly better scores compared to NC group. See Figure 1. With power = .88, the effect size was considered to be of medium strength, .50σ.

To test Hypothesis 2, that the strategies employed by coached simulators are significantly different from strategies employed by uncoached simulators, a nonparametric multiple-comparisons test, namely the Mann-Whitney U test, was used. The independent variable was group classification (C versus NC) and the dependent variable was frequency of employed strategies. As no significant differences were observed in the HI and NHI groups in Hypothesis 3, this analysis of Hypothesis 2 was performed with the entire sample, collapsing across HI and NHI states. Results indicate no significant differences between the C and NC groups in using the following malingering strategies: total memory loss, $U = 1916.00$, $p = .30$; slow rate of responding, $U = 21430.50$, $p = .66$; poor concentration $U = 1991.00$, $p = .50$; confusion $U = 1840.00$, $p = .16$; nervousness $U = 2098.50$, $p = .85$; dyslexia $U = 1924.40$, $p = .32$; and partial memory loss $U = 2121.50$, $p = .95$. See Figure 1. The most frequently used malingering strategies were poor concentration and partial memory loss followed by slow processing speed, confusion, nervousness, dyslexia, and total memory loss. See Figure 2.

Table 3

Comparison of Test Performance across Coached and Uncoached Groups.

	Uncoached ***M (SD)***	**Coached** ***M (SD)***
TOMM 1*	30.17 (1.40)	38.38 (1.40)
TOMM 2*	31.33 (1.70)	39.42 (1.70)
TOMM R*	30.51 (1.75)	39.16 (1.75)
MFIT Total	11.89 (.51)	13.19 (.51)
DCT Errors	5.27 (.51)	4.04 (.51)
PDRT Easy	20.04 (1.01)	22.74 (1.01)
PDRT Hard	18.97 (.89)	21.13 (.89)
PDRT Total*	38.91 (1.80)	43.91 (1.81)
WMT IR	65.80 (14.91)	93.71 (14.92)
WMT DR*	65.83 (3.13)	80.11 (3.13)
WMT CNS	69.32 (2.87)	75.31 (2.87)
WCMT I*	16.04 (.85)	19.58 (.85)
WCMT R*	5.58 (1.46)	9.75 (1.46)
PAI NIM	78.48 (3.60)	76.94 (3.60)

* $p \leq .05$

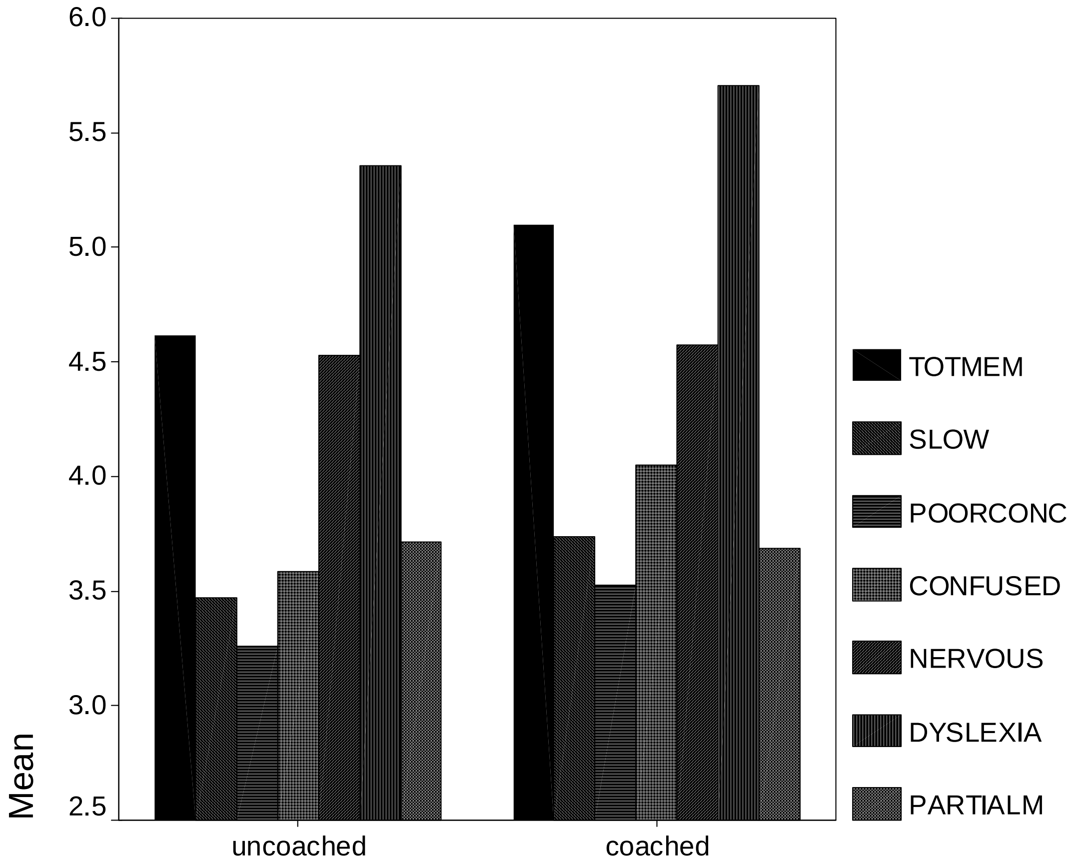

Figure 1

Mean values of Malingering Strategies in Coached and Uncoached Simulators.

**Scale based on 1 – 8, with 1 being most closely representative of the participant's strategy and 8 being least representative.*

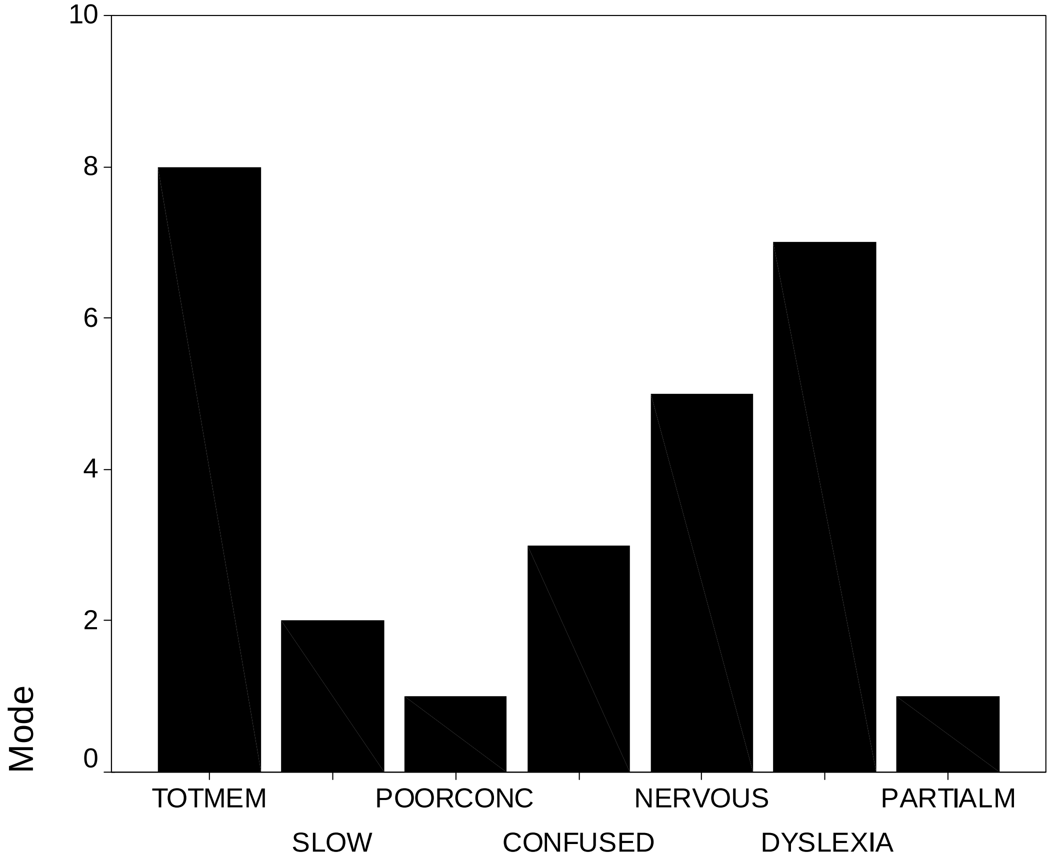

Figure 2

Modal Values of Malingering Strategies in Coached and Uncoached Simulators.

**Scale based on 1 – 8, with 1 being most closely representative of the participant's strategy and 8 being least representative.*

All participants were asked to report on which test they believed (1) would catch someone who was trying to fake an injury; (2) was the easiest to fake an injury; (3) was the hardest to fake an injury; (4) was the most difficult to take; and (5) was the most aversive. The PAI was most frequently reported by the C group as the test most likely to catch someone malingering whereas participants in the UC group reported the TOMM as the test most likely to detect malingering. Both groups reported the TOMM as being the easiest test to fake a head-injury on and listed the PDRT as the hardest test to perform as if injured, the most difficult test to take, and as the most aversive test in the battery.

To ensure that participants complied with the request to perform as if they were head-injured, they were asked to rate their perceived level of success in portraying a head-injury as well as to gauge how hard they tried. Individuals in the C group reported an average level of 2.43 and the UC group reported an average level of 2.50 (based on a 6 point Likert scale: 0 = not at all, 5 = very) in rating their perceived level of success. This difference was not significant, t (129) = .354, p = .724. Similarly, no significant difference was observed on reported level of effort, t (129) = 1.581, p = .116. Individuals in the C group endorsed trying at a level of 3.33 and individuals in the UC group reported trying at a level of 3.61.

Discussion

Nearly 75% of attorneys reported coaching their clients on the content and purpose of neuropsychological tests and measures prior to a forensic evaluation (Essig et al., 2001). The frequency of coaching as well as the manner in which clients are coached can have potentially severe consequences for the ability of neuropsychological tests and measures to detect feigned or fabricated deficits. Although numerous studies have examined the vulnerability of effort measures to coaching, no study has directly compared frequently used measures of effort against one another to determine which are relatively more or less vulnerable to coaching. Furthermore, no study has examined the profile of malingering strategies utilized by individuals who have been coached. Examination of both the vulnerability of detection measures to coaching as well as the strategies utilized by individuals who are coached will help to prepare the clinician against efforts to avoid detection and thus ensure a more accurate neuropsychological assessment.

The first purpose of this study was to determine which commonly used malingering measures are most susceptible to coaching. To test this, simulated malingerers were provided with information regarding the typical head-injury sequelae as well as informed on the ability of neuropsychological and psychological tests to detect exaggeration or fabrication. These simulated malingerers were then compared to simulators who did not receive such information. It was hypothesized that coached simulators would demonstrate significantly less severe performance failures compared to the uncoached simulators. Less severe scores were observed in the coached simulators on 13 of 14 indices, with 7 being statistically significantly better. Furthermore, even the

WCMT, a measure designed to be robust to the effects of coaching was vulnerable to coaching and significantly better in coached versus uncoached simulators.

To determine which detection methods are more vulnerable to coaching, the measures used in this study were separated by the strategy on which they were based (i.e., SVT, floor effects, etc.) Testing for atypical performance was most vulnerable to coaching, with coached samples passing 2 of 2 indices compared to the uncoached sample who failed both. In addition, several of the symptom validity indices were found to be vulnerable. Uncoached participants failed all 9 indices, whereas coached samples successfully passed 4 of 9 indices. A test based on the performance curve was found to be invulnerable to coaching, with malingering in both the coached and uncoached samples detected. Finally, tests utilizing validity indices as well as tests using floor effects were unable to detect malingering in either sample; therefore, coaching vulnerability of these measures could not be deciphered. See Table 4.

The specific measures that were vulnerable to coaching include the PDRT, the WMT Immediate Recall, and the WCMT. Perhaps it was because, as Suhr and Gunstad (2000) suggested, coached individuals "suppressed their tendency to do devastatingly poorly on measures they perceived to be easy" (p. 402); however, both the coached and uncoached groups reported the PDRT as the most difficult and most aversive measure rather than the easiest. In addition, when queried, neither group endorsed any of the above three measures as "most likely to catch someone faking." In fact, the coached group listed the PAI as the test most likely to detect malingering compared to the TOMM which was reported in the uncoached sample.

Table 4

Performance Outcomes in Coached and Uncoached Simulators

Method	Uncoached	Coached
Symptom Validity Test		
TOMM 1*	**Fail**	**Fail**
TOMM 2*	**Fail**	**Fail**
TOMM R*	**Fail**	**Fail**
PDRT Easy*	**Fail**	Pass
PDRT Hard*	**Fail**	Pass
PDRT Total*	**Fail**	Pass
WMT IR	**Fail**	Pass
WMT DR	**Fail**	**Fail**
WMT CNS	**Fail**	**Fail**
Performance Curve		
DCT	**Fail**	**Fail**
Floor Effects		
MFIT	Pass	Pass
Atypical Test Performance		
WCMT I	Pass	Pass
WCMT R	**Fail**	Pass
Validity Indices		
PAI NIM	Pass	Pass

*based on cutoff scoring

Examination of the strategies used by coached malingerers may help to elucidate the reason why some measures are more vulnerable to coaching. Coached simulators in this study endorsed poor concentration and partial memory loss as the strategies most frequently employed and total memory loss, nervousness, and confusion as the least frequently employed. It may be that utilizing a more subtle symptom approach combined with the knowledge obtained through coaching allows for a malingerer to successfully navigate these measures undetected. Future research should examine whether measures most vulnerable to coaching are less sensitive to subtle symptoms such as partial memory loss and poor concentration rather than to more exaggerated symptoms of complete memory loss or confusion.

The findings in this study are in contrast to some of the published findings on malingering detection and coaching. For example, both the PDRT and the WCMT were found to be invulnerable to coaching in previous studies (Rose, Hall, Szalda-Petreem, & Bach, 1998; Hilsabeck et al., 2001) but found to be vulnerable here. It is likely that the vulnerability of detection measures varies as coaching methods vary, thus the reason for the dichotomy. In research, coached instructions are standardized and based on the particular tests administered but this is not the case in the real-world. Rarely are attorneys aware of all the detection measures included in the neuropsychological battery. In addition, there is likely no universally accepted coaching method among attorneys. Future research comparing different methods of coaching (such as teaching specific test failure, providing individuals with knowledge of a disorder, or coaching the participant to voice specific complaints) across a stable battery of detection measures will help to determine the contribution of coaching methods to malingering detection vulnerability.

Overall, the findings of this study make several contributions to forensic neuropsychological research and practice. One aim of this paper was to improve on the methodology utilized in malingering research. Previous literature suggested that the inclusion of individuals with a history of head-injury would be more generalizable to real-world malingerers (Cato et al., 2002). The results of this study suggest that a history of head-injury does not allow one to simulate symptoms more successfully. It is possible, however, that the sample size utilized in this study did not allow for enough power to detect a difference if one existed; therefore, future research utilizing a larger sample size may be needed. Furthermore, the participants with a history of head-injury utilized in this study were recruited from university undergraduate courses and may represent individuals who are functioning at a higher level compared to others with a history of mild head-injury. Perhaps demographically matching educational variables to real-world malingerers will improve the generalizability of simulators with a history of head-injury.

In regards to practical application, the findings of this study demonstrate that coaching has a significant effect on the detection success of several malingering measures. A forensic neuropsychologist may be able to arm himself against this vulnerability. Perhaps the ability to detect malingering can be increased by incorporating several, rather than just one measure of malingering. When doing this, the neuropsychologist should pick measures that vary in degree of difficulty and face validity as a detection measure. In this way, the neuropsychologist is more likely to present the patient with a measure or method in which he has not been coached. A clinician would do best to build a detection battery around the malingering classification categories developed by Slick et al (1999). Although several indices were found to be vulnerable to coaching within this study, the application of Slick et al's (1999) classification categories detected probable or definite malingering in 100% of the coached sample. See Figure 3. A clinician must use caution, however, when adding multiple measures to the battery because with each additional measure, the error rate is increased via alpha inflation. Future research outlining the relationship between multiple measures and increased error-rate would better prepare the clinician in creating a detection battery.

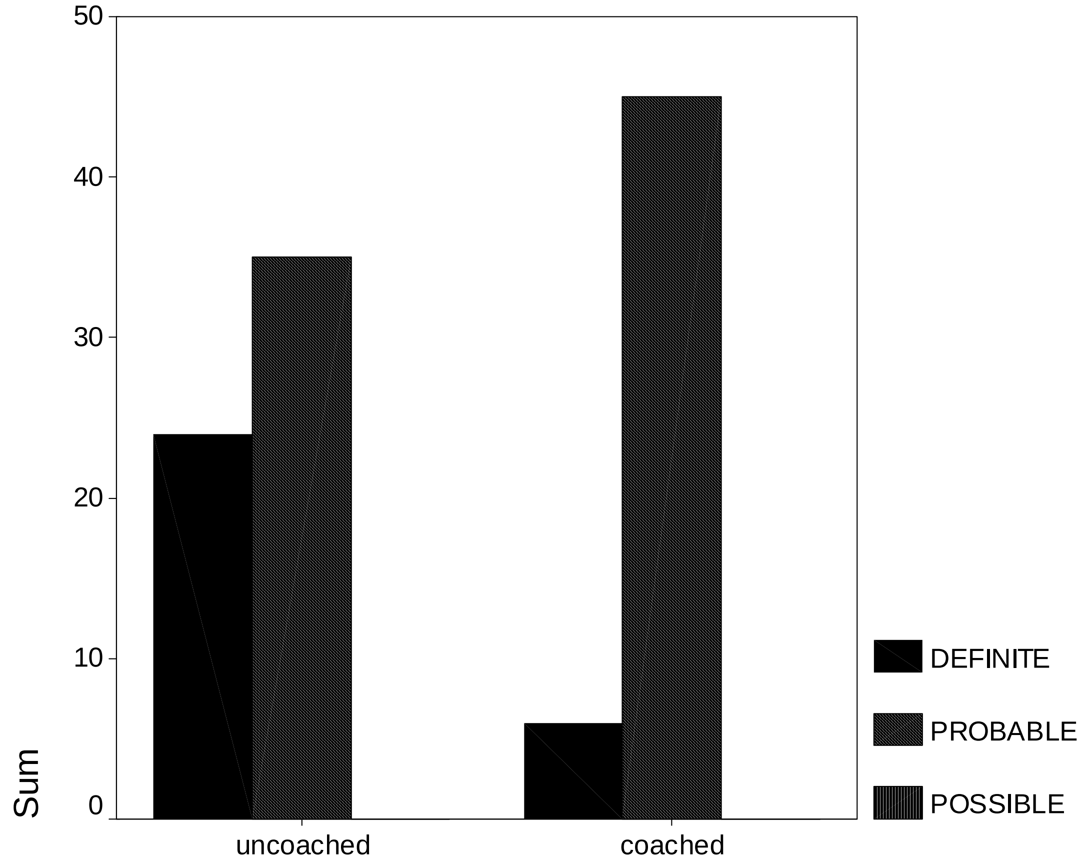

Figure 3

Classification Categories of Coached and Uncoached Simulators.

Addendum

When this study was originally proposed in January 2006, a fourth hypothesis was included. This hypothesis was developed in an attempt to further improve the external validity of the simulation design. It was hypothesized that the inclusion of actors as simulating malingerers would further improve the generalizability to real-world malingers. After attempting over the course of one year to recruit actors via contacting theater professors, posting advertisements on audition boards in and around the theater department, contacting various acting troupes and directors in the Baton Rouge and New Orleans area, creating a webpage linked to acting groups on networking websites such as myspace.com and facebook.com , and offering coauthorship to tenure-tracked theater professors, data collection was terminated (based on committee approval). It appears that the difficulty in recruiting subjects says more about the hypothesis than data analysis could. Because recruiting actors is so extremely difficult, including them in a study could actually lessen the external validity (by increasing the likelihood of invalid collection procedures and biased sampling) and thus reduce the generalizability to real-world malingerers.

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Appendix A

Structured Clinical Interview

Subject #:______ Examiner:____________________

Age: _________ Drama Psychology

Race: ________ Coached Uncoached

Gender: _______ Head-Injury No Head-Injury

Highest grade completed: ________

Do you currently, or have you previously, had any type of neurological disorder, for example epilepsy or any psychological disorder? If so please explain.

____
____
____
____

Have you ever been hit on the head so hard that you blacked out? If so please explain when and how long you were unconscious.

____
____
____
____

LOC = ___________ PTA = _____________

(If experienced a head-injury) Were you involved in any lawsuits following your injury?

____
____
____
____

Have you ever worked or volunteered as an actor in any capacity?

____
____

Appendix B

Portland Digit Recognition Test

Subject #:______ Examiner:____________________

	Easy – 5”	Easy – 15”	Hard – 30”	Hard - 30”
1. 71394				
2. 27586				
3. 58192				
4. 38295				
5. 72819				
6. 94376				
7. 56392				
8. 82193				
9. 81293				
10. 47391				
11. 48526				
12. 86524				
13. 41759				
14. 74629				
15. 38295				
16. 59182				
17. 12853				
18. 28149				

Correct: ___________ ___________ ___________ ___________

Easy Items Correct: ___________
Hard Items Correct: ___________
Total Correct: ___________

Appendix C

Memory for Fifteen Items Test

Subject #:______ Examiner:____________________

Column 1 Correct: ________

Column 2 Correct: ________

Column 3 Correct: ________

Column 4 Correct: ________

Column 5 Correct: ________

Total Correct : ____________

Appendix D

Dot Counting Test

Subject #:______ Examiner:___________________

(Circle One)

Card 1: Error/No Error

Card 2: Error/No Error

Card 3: Error/No Error

Card 4: Error/No Error

Card 5: Error/No Error

Card 6: Error/No Error

Card 7: Error/No Error

Card 8: Error/No Error

Card 9: Error/No Error

Card 10: Error/No Error

Card 11: Error/No Error

Card 12: Error/No Error

Total Number of Errors: __________

Appendix E
Strategy Questionnaire

Subject #:______ Examiner:____________________

Drama Psychology

Coached Uncoached

Head-Injury No Head-Injury

1.) Rank order (1-8) the following approaches from *most* like your performance to *least* like your

a. ________ Total Memory Loss
b. ________ Slow rate of responding
c. ________ Poor Concentration
d. ________ Confusion
e. ________ Nervousness
f. ________ Dyslexia
g. ________ Partial Memory Impairment
h. ________ Other

2.) Which of these tests do you think could catch someone faking a head-injury?

a. ________ TOMM
b. ________ PDRT
c. ________ WMT
d. ________ MFIT
e. ________ DCT
f. ________ WCMT
g. ________ PAI
h. ________ WRAT3

3.) Which of these tests were the easiest to perform as if you were head-injured?

a. ________ TOMM
b. ________ PDRT
c. ________ WMT
d. ________ MFIT
e. ________ DCT
f. ________ WCMT
g. ________ PAI
h. ________ WRAT3

4.) Which of these tests were the most difficult to perform as if you were head-injured?

a. ________ TOMM
b. ________ PDRT
c. ________ WMT
d. ________ MFIT
e. ________ DCT
f. ________ WCMT
g. ________ PAI
h. ________ WRAT

5.) Which test was the most difficult?

a. ________ TOMM
b. ________ PDRT
c. ________ WMT
d. ________ MFIT
e. ________ DCT
f. ________ WCMT
g. ________ PAI
h. ________ WRAT

6.) Which test was most aversive?

a. ________ TOMM
b. ________ PDRT
c. ________ WMT
d. ________ MFIT
e. ________ DCT
f. ________ WCMT
g. ________ PAI
h. ________ WRAT

7.) Did you prepare for your role as an individual with a head-injury before the testing session?

________ Yes
________ No

8.) If yes, how much time did you prepare for this role?

____

9.) How did you prepare for this role?

a. _________ Read about brain damage in a book or on the internet
b. _________ Watched a movie about someone with brain damage
c. _________ Spoke with someone I know who has brain-damage
d. _________ Other:______________________________________

Appendix F

Subject Rating Scale

Subject #:______ Examiner: ____________________

1.) How successful do you think you were in your attempt to portray someone with a brain-injury? (Circle one)

Not at all Very

0 1 2 3 4 5

2.) How hard did you try? (Circle one)

Not at all Very

0 1 2 3 4 5

Appendix G
Consent Form

Louisiana State University
236 Audubon Hall
Baton Rouge, LA 70803-5501
(225) 578-1494 Phone - (225) 578-4661 Fax

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1. Study Title:
   The Vulnerability of Coaching Across Measures of Malingering

2. Performance Site:
   Louisiana State University

3. Investigators:
   The investigators listed below are available to answer questions about the research, M - F, 8:00 a.m. - 4:00 p.m.

   Wm. Drew Gouvier, Ph.D. & Adrianne Brennan, M.A.
   (225) 578-1494

4. Purpose of the Study:
   The purpose of this research is to determine whether different factors, such as internal motivation, coaching, and/or the history of a head-injury allow one to better portray an individual with a head-injury.

5. Subjects:
   A. Inclusion criteria: $\geq$ 18 years old
   Current undergraduates at LSU

   B. Exclusion criteria: Neurological disease or seizure disorder
   Present psychological disorder

   C. Maximum number of subjects: 120

6. Study Procedures:

   The experiment will take place over two sessions. During the first session, the participant will be interviewed about their medical and psychological history and provided with directions requesting that they perform as if they had a head-injury. During the second session, the participant will take 8 tests on which they will be asked to perform as if they had a head-injury. Interview plus test administration should not exceed three hours.

7. Benefits:
   Each undergraduate subject will receive six (6) extra credit points for full participation in this three (3) hour study. Information gained from this study may help us to better understand and improve current psychological research in the area of malingering.

8. Risks/Discomforts:
   There is no known risk associated with participation in this study above what might be experienced in an average day.

9. Injury/Illness:
   To assure that subject's privacy is respected, this study will be anonymous.

10. Right to Refuse:
    Participation in this study is completely voluntary and subjects may change their minds and withdraw from the study at any time without penalty.

11. Privacy:
    Subjects' names on consent forms will not be able to be linked to interview and questionnaire responses. Additionally, consent forms will be stored separately from data.

    The LSU Institutional Review Board (which oversees university research with human subjects) and Wm. Drew Gouvier, Ph.D. may inspect and/or copy the study records.

    Results of this study may be published, but no names or identifying information will be included in the publication.

12. Financial Information:
    There is no cost to the subjects. Subjects will receive six (6) extra credit points.

13. Withdrawal:
    You may withdraw from this study at any time; however, extra credit points will not be given for less than full participation. To withdraw, inform the principle investigator or research assistant of your decision.

14. Removal:

If it becomes apparent that the subject is not responding in a forthright manner or additional information suggesting that a subject meets exclusion criteria is disclosed later in the study, the subject will be removed from the study without his or her consent.

The study has been discussed with me and all my questions have been answered. I may direct additional questions regarding study specifics to the investigator or research assistants. If I have questions about subjects' rights or other concerns, I can contact Robert C. Matthews, Chairman, LSU Institutional Review Board, (225) 578-8692. I agree to participate in the study described above and acknowledge the investigator's obligation to provide me with a signed copy of the consent form.

Subject Signature ____

Subject Name (Print) ____

Date _________

Witness Signature ____

Date __________

Vita

Adrianne M. Brennan was born and raised in New Orleans, Louisiana. She received a Bachelor of Arts Degree with Honors in psychology from the University of New Orleans in 2001. In 2004, while under the direction of Dr. Wm. Drew Gouvier, she was awarded a Master of Arts Degree in psychology from Louisiana State University. She is currently fulfilling her internship requirements at the Louisiana State University Health Sciences Center in New Orleans.