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THE EFFICIACY OF THE MMPI-2 LEES-HALEY FAKE BAD SCALE (FBS) FOR DIFFERENTIATING NEUROCOGNITIVE AND PSYCHIATRIC FEIGNERS

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ABSTRACT OF THESIS

THE EFFICIACY OF THE MMPI-2 LEES-HALEY FAKE BAD SCALE (FBS) FOR
DIFFERENTIATING NEUROCOGNITIVE AND PSYCHIATRIC FEIGNERS

The FBS (Lees-Haley, 1992) is a relatively new validity scale for the MMPI-2 designed specifically to detect feigned neurocognitive deficit. The aim of the present study was to examine the FBS's efficacy in differentiating psychiatric and neurocognitive feigners using a known-groups design. Malingering tests were administered to 180 individuals undergoing forensic neuropsychiatric evaluations. Based on the malingering test results, participants were classified as honest responders, psychiatric feigners, neurocognitive feigners, or feigning both psychiatric and neurocognitive deficits. The FBS significantly differentiated the 3 feigning groups from the honest group, but it did not discriminate effectively between neurocognitive and psychiatric feigners.

KEYWORDS: Malingering, MMPI-2, Fake Bad Scale (FBS), Neurocognitive Feigning,
        Psychiatric Feigning

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THESIS

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The Graduate School

University of Kentucky

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THESIS

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A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in the
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By

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Lexington, Kentucky

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Lexington, Kentucky

2003

To my mother, who supports all of my endeavors and
without whom the completion of this thesis may have been impossible.

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Chapter One

Introduction

<u>Malingering in Psychological Settings</u>

Most individuals misrepresent themselves at some point in their lives. For example, lying to friends about whether they look bad in a new outfit seems harmless, and in fact may simply be part of human nature and a desire to avoid hurting a friend's feelings. However, by giving another person a planned but incorrect impression, people can also gain many other valued outcomes. For example, a child may feign illness to avoid school, a person who is unemployed may misrepresent his or her job search efforts in order to continue to receive unemployment benefits, and a plaintiff in a lawsuit for psychological damages may exaggerate his or her complaints to obtain a larger settlement. Thus, there is probably a continuum of deliberate impression management ranging from "white lies" to outright fraud.

At times, detection of misrepresentation or lying about psychological symptoms can literally be a life or death issue. Most people are familiar with publicized court cases in which the accused have pled insanity as a defense in a capital crime. The professionals involved (judges, lawyers, psychologists, etc.) may have to determine whether the defendant was actually "insane" at the time of the crime or simply feigning insanity to escape consequences for his or her actions. Personal injury litigation is another area in which psychologists must determine the honesty of a plaintiff's claim of head or bodily injury. Given the issues involved in personal injury cases after head trauma, individuals may potentially be compensated with large sums of money if the level of dysfunction they experience is great. The prospect of a large cash settlement may well be a strong motivation to present one's case in the worst light. Thus, it is important to develop and refine methods to identify correctly individuals who are overreporting their symptoms in compensation-seeking circumstances, as well as those who are honestly responding.

In mental health evaluations, the most egregious type of impression management is known as "malingering". More technically, malingering is the intentional feigning or gross exaggeration of a condition or symptoms for an external incentive (DSM-IV-TR, APA, 2000). Malingering is listed in the DSM-IV-TR as a "V-code", meaning it may be a condition that warrants clinical attention, but is not a mental disorder. Two factors must be present for malingering to be established. First, the individual must consciously control the production of

the false symptoms (distinguishing malingering from Conversion Disorder), and second, there must be an external incentive for the production of the false symptoms (distinguishing malingering from Factitious Disorder).

Several authors have suggested that in clinical settings there may be two distinct types of malingering: psychiatric and neurocognitive/somatic (Larrabee, 1998; Iverson, Henrichs, Barton, & Allen, 2002). Perhaps the most well-known type of feigning involves individuals malingering psychiatric symptoms in order to portray themselves as having a significant condition such as a psychotic disorder, which might exculpate them from a criminal penalty. Malingered neurocognitive deficits may be less familiar. This involves individuals trying to portray themselves as having primarily cognitive impairments such as memory problems. The research literatures on these two types of malingered symptoms are usually separate, as are the assessment techniques used to identify the feigning. The present study will bring these two literatures together in an investigation of whether the MMPI-2 (which has traditionally been used to detect psychiatric malingering) can contribute to identification of individuals malingering neurocognitive/somatic deficit. More specifically, this study will evaluate a relatively new MMPI-2 validity index, the Fake Bad Scale (FBS; Lees-Haley, English, & Glenn, 1991; Lees-Haley, 1992), which has shown some promise in recent literature as a method for differentiating neurocognitive malingerers from psychiatric malingerers. Before explaining this study in detail, it is necessary to review several issues related to conducting malingering research, particularly the methodology and relevant statistics for evaluating the classification accuracy of validity scales or tests.

Methodology for Malingering Research

Two important issues in malingering research are the designs employed to validate malingering tests and the techniques used to document the response set. Three main research designs have been utilized to validate malingering tests and determine their accuracy in classifying responders as honest or malingering. A simulation study design typically uses "unimpaired" or nonclinical populations such as Psychology 100 students and assigns the participants to respond to a test honestly or with instructions to "fake bad" (in other words, to look cognitively or psychiatrically impaired on the tests). The accuracy of the test is estimated with reference to the number of people in each group correctly classified on the basis of their test results. While the simulation study design is appropriate for an initial validation study for a

malingering test due to its high internal validity, it has little generalizability to relevant clinical populations unless a "clinical honest" group is included. A major drawback of this design is its lack of external validity in that it does not examine the test's utility in an actual forensic population (real-world malingerers).

Another frequently used research design in the area of malingering is called a differential-prevalence design. This design compares malingering test scores of a group at high risk for feigning (compensation seekers) to a group with low risk for feigning (non-compensation seekers). The malingering test's positive classification rate should be higher in the compensation seeking group, because there are thought to be more individuals exaggerating in this group. If no difference is found in the rates of positive (malingering) scores in the two groups, serious questions about the validity of the malingering measure should arise. The external validity of this method is higher than in the simulation study, because individuals actually undergoing clinical and forensic evaluations are used as participants. However, a major drawback to this research design is that it cannot be used to assess the accuracy of test classifications, as the exact criterion status of each subject is unknown.

Due to its logistical difficulty, a known-groups design is generally the last methodology used in malingering test validation. This approach assesses the accuracy of a test's classification rate in actual clinical or forensic samples. A "gold standard" malingering measure is used to assign the evaluees to honest or malingering groups. The accuracy of the new test is established by determining its classification rate in the two groups identified by the criterion measure. This research design has higher external validity than the simulation study because actual clinical populations undergoing evaluations are evaluated. However, a drawback for this design is that the validity of the gold standard test determines the ceiling of the estimated accuracy of the new test. In addition, it is possible that only blatant malingerers may be identified by the external test and thus, the results may be somewhat limited in terms of generalizability. Finally, because true experimental control over the variable of malingering is not achieved, the issue of causality cannot be addressed.

Rogers (1997) advocates requiring multiple supportive findings across the different designs before accepting a malingering test as valid. Simulation studies are viewed as good initial designs for evaluating new malingering tests because of the high level of control over the subject's response style (assigned malingerers vs. honest responders). Differential-prevalence

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designs give information about the construct validity of the new procedure in clinical groups thought to have different base rates of feigning. Known-group designs also use actual clinical populations to raise external validity, and this design addresses the problem of internal validity by classifying individual evaluees as honest or malingering based on the test sign from a gold standard malingering measure. Minimally, validation using both simulation studies and known-groups designs is thought to be necessary for establishing the efficacy of a new malingering measure (Berry, Baer, Rinaldo, & Wetter, 2002).

Neuropsychometrics

The classification accuracy of all tests is traditionally expressed using specific statistics and terminology. Sensitivity and specificity are parameters describing a test's classification rate. In the case of malingering tests, sensitivity is the percentage of participants who are malingering who have a positive test sign. Specificity is the percentage of participants who are not malingering who have a negative test sign. Sensitivity and specificity describe the accuracy of a test sign, given that the criterion status of an individual is known, which unfortunately is rarely the case in clinical practice. Two more clinically relevant statistics are Positive Predictive Power (PPP) and Negative Predictive Power (NPP). PPP is the percentage of positive test signs that correctly identify individuals who are malingering. NPP is the percentage of negative test signs that correctly identify honest responders. Although PPP and NPP are partly dependant on the base rate of malingering in a population, they are generally accepted as the most clinically relevant classification parameters.

Unfortunately, the actual base rates of malingering which must contribute to determining PPP and NPP are not known. However Strong, Greene, and Schinka (2000) used taxometric analysis of items from the MMPI-2 to estimate the base rate of overreporting of symptoms on the MMPI-2 in psychiatric inpatients and at a variety of VA medical units. They found that approximately 27% of the psychiatric inpatients and 19% of the VA patients were overreporting problems. More recently, the base rate for malingering after mild head injury was estimated to be almost 40% based on a survey of forensic neuropsychologists (Mittenberg, Patton, Canyock, & Condit, 2002). These base rate estimates for psychiatric and neurocognitive deficit malingerers are important, because as noted above, along with sensitivity and specificity values, base rates are used to determine PPP and NPP. While sensitivity and specificity are usually assumed to remain constant as a property of the test and cutting score, PPP and NPP will vary

with base rates of malingering in various settings.

Detection of Malingering in Clinical and Forensic Settings

Clinical frameworks for identifying malingering vary. Although no formal criteria are given for arriving at a determination of malingering, guidelines in the DSM-IV-TR (2000) instruct the clinician to suspect malingering if two or more of the following conditions are present: a medicolegal context, discrepancy between subjective and objective information, lack of cooperation with the assessment or treatment, or the presence of Antisocial Personality Disorder. However these criteria have been severely criticized (Rogers, 1997), and are probably applicable only to psychiatric malingering. For diagnosis of cognitive/somatic malingering, Slick, Sherman, and Iverson (1999) developed a set of criteria for identifying *Definite* malingering of neurocognitive deficits (MNCD) that is more specific than the general guidelines outlined in the DSM-IV-TR. Those criteria are 1) the presence of a substantial external incentive, 2) definite negative response bias, as demonstrated by significantly worse-than-chance performance on a well-validated measure of malingering, and 3) the behaviors meeting the necessary criteria from the test data are not fully accounted for by psychiatric, neurological, or developmental factors.

Slick and colleagues (1999) also propose definitions and criteria for *Probable* and *Possible* malingered neurocognitive dysfunction. *Probable* MNCD is documented by the presence of evidence *strongly* suggesting intentional exaggeration or fabrication of cognitive dysfunction without plausible alternative explanations. The criteria for *Probable* MND are 1) the presence of a substantial external incentive, 2) two or more types of evidence of fabrication or exaggeration from neuropsychological testing, excluding definite negative response bias *or* one type of evidence from neuropsychological testing (excluding definite negative response bias) and one or more types of evidence of fabrication or exaggeration from self-report, and 3) the behaviors meeting the necessary criteria from the test data or self-report are not fully accounted for by psychiatric, neurological, or developmental factors. *Possible* MNCD is indicated by evidence for intentional exaggeration or fabrication of cognitive dysfunction without plausible alternatives. The criteria for *Possible* MNCD are 1) the presence of a substantial incentive, 2) evidence of fabrication from self-report, and 3) behaviors meeting the criteria from self-report are not fully accounted for by psychiatric, neurological, or developmental factors. Recent published research has begun to apply the Slick et al. (1999) criteria to detection of

cognitive/somatic malingering (Greve, Bianchini, Mathias, Houston, & Crouch, 2003).

<u>Detecting Feigned Neurocognitive/Somatic Symptoms</u>

Neuropsychological tests assess cognitive functions that may be depressed as a result of brain damage or dysfunction. However, in addition to integrity of brain functioning, these tests are also sensitive to a variety of potentially confounding factors, such as medication effects, psychiatric conditions and adequate effort from the test taker. Thus, among other concerns, the validity of these tests depends on obtaining optimal effort from the test taker. In compensation-seeking circumstances, individuals may deliberately underperform on tests designed to measure their current cognitive ability. As previously noted, this phenomenon is generally known as malingering neurocognitive deficits. Individuals involved in circumstances in which there is potential monetary incentive for being impaired, such as in litigation or worker's compensation, are thought to be more likely to feign neuropsychological impairment (Pankratz & Binder, 1997). While results from standard neuropsychological tests are sometimes used to draw inferences about motivation, previous research suggests that performances on these tests alone may be inadequate indicators of malingering (Heaton, Smith, Lehman, & Vogt, 1978). This concern prompted the creation of separate, objective indices specifically intended to detect feigned cognitive deficits. These tests were designed to be relatively insensitive to brain dysfunction but broadly reflective of the level of effort given, hence the common name "motivational tests".

Neuropsychological tests are designed to detect and measure significant brain impairment, so they tend to be relatively easy for the unimpaired individual. Therefore, in order to feign cognitive deficits, the typical intact individual must either deliberately try to answer the test items incorrectly or exert little effort to perform adequately. While intentionally faking answers or expending inadequate effort on motivational tests, malingerers may actually go too far and perform more poorly than an individual with significant brain impairment. In extreme cases, malingerers may perform significantly below chance on dichotomous, forced-choice recognition memory tasks, providing evidence for intentional feigning. However, Guilmette et al. (1994) and others have reported that use of a strict significantly below chance performance is insufficiently sensitive to more subtle forms of malingering. This led to the current practice of comparing results on motivational tests from compensation-seeking individuals with questionable evidence of brain damage to non-compensation seeking groups with objective

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evidence from neuroimaging of moderate to severe head injury. Performances on motivational tests falling below cutoff scores established in the non-compensation-seeking, but significantly cognitively impaired group raise the possibility of malingering in individuals with little or no documented brain damage. Three well-validated tests used to detect neurocognitive malingering are the LMT, the TOMM, and the VSVT.

        <u>Letter Memory Test (LMT).</u>

        The Letter Memory Test (LMT; Inman, Vickery, Berry, Lamb, Edwards, & Smith, 1998) is a computer-administered, 45-item, forced-choice recognition task that uses consonant letters as stimuli. It is entirely computer based and has constant delay periods of 5 seconds across all trials. In an effort to increase chances of detecting deliberately poor effort from a test taker, the face difficulty of the test is manipulated in two ways: the number of letters to be remembered and the number of choices amongst which the target stimulus is identified. The manipulation was based on the hypothesis that malingerers "titrate" their performances to "pass" obviously easy items, but "fail" presumably difficult tasks.

        The LMT (Inman et al., 1998) was validated following many of the methodological suggestions by Rogers (1997) for malingering research. Participant groups included patients with moderate to severe head injury, college students, community volunteers, depressed psychiatric patients, non-compensation-seeking neurological patients, and compensation seeking individuals with MHI. Inman et al. (1998) found that the LMT discriminated honest responders from those putting forth poor effort with moderately high levels of accuracy. In the initial validation study combined patient groups were contrasted with combined analogue malingerers and a strong effect size (Cohen's $d = 2.00$) was found. Using a cutting score of less than 93% correct, the authors found a specificity of 100%, sensitivity of 84%, and an overall hit rate of 92%. A high internal consistency reliability coefficient alpha was found at .944. A strong effect was also found for distinguishing known groups of independently identified malingerers from honest neurological patients and the sensitivity and specificity were very good at 95% and 100% respectively.

        In a study by Inman and Berry (2002), the LMT attained a high hit rate for the detection of malingering in an "enhanced" simulation study of college students with a history of a head injury. The LMT again had good sensitivity and specificity (73% and 100%, respectively). Orey, Cragar, and Berry (2000) found lower sensitivity for the LMT at 58% and excellent

specificity of 100% for head injured college students in a simulation study. Vickery, Berry, Dearth, Vagnini, Baser, Cragar, & Orey (in press) found an even higher sensitivity (84.8%) and slightly lower specificity (93.5%) for head injured participants and community volunteers in a simulation design. Thus, the LMT appears to have adequate sensitivity and good specificity as a measure for detecting feigned neurocognitive impairment.

Test of Memory Malingering (TOMM).

The Test of Memory Malingering (TOMM; Tombaugh, 1996) consists of 50 line drawings of common objects. There are three trials. In Trial 1, the 50 pictures are presented one at a time for 3 seconds each. After presentation of the 50 drawings, recognition testing is administered, consisting of 50 trials, each with one of the previously shown target drawing paired with a novel foil. The test taker chooses the pictures he or she remembers having been shown previously. In Trial 2, the same format as Trial 1 is used and the 50 old drawings from Trial 1 are presented again, followed by a test involving 50 pairs of pictures (target and novel foil pictures) in which the previously seen item must be chosen. A retention trial is also administered after a delay of approximately 20 minutes. The retention trial involves testing only with the 50 target drawings and 50 new foils; the test taker chooses the one he or she remembers being shown before the delay. Development of this test was based on evidence that recognition memory (as opposed to free recall memory) is typically left intact even after severe neurological impairment. Thus, the TOMM implicitly manipulates face difficulty level by presenting a task that is erroneously thought by many test-takers to be difficult.

The development of the TOMM was conducted in two phases using nonclinical subjects and a clinical sample with diverse cognitive impairments. The nonclinical population was found to be extremely accurate at identifying targets. In the first trial 94% of the targets were correctly identified as were over 99% of the targets for the remaining two trials. Individuals with various cognitive impairments also identified targets at a rate almost as high as the nonclinical population, establishing the test's insensitivity to significant brain impairment. Based on these results, a cutoff of 45/50 (90%) was established for identifying poor effort.

In the second series of studies, the test was first validated on a group of "at-risk" malingerers in a differential-prevalence design. The scores for the compensation seeking group were significantly lower than for the previous two groups of honest responders. Additionally, in a simulation study, a sensitivity and specificity of 100% for individuals instructed to fake or

respond honestly on the TOMM were obtained with the suggested cutoff score. Finally using a criterion of 45/50 (90% correct) on the second trial correctly classified 95% of all non-demented patients and 91% of all patients (including patients with Alzheimer's Disease) as not malingering in a validation sample of 475 community volunteers and 161 neurologically impaired patients (Tombaugh, 1997). A later study by Rees, Tombaugh, Gansler, and Moczynski (1998) demonstrated converging validity using simulators, high-risk populations for malingering to occur, and a computer form of the test. Reliability coefficients were not reported for the TOMM. Based on this evidence, the TOMM appears to be one of the best validated motivational tests available.

    <u>Victoria Symptom Validity Test (VSVT).</u>

    The Victoria Symptom Validity Test (VSVT; Slick, Hopp, Strauss, & Thompson, 1996) is a computerized, forced-choice digit recognition test that includes two manipulations of face difficulty level. It consists of 48 trials, with 24 "easy" items and 24 "difficult" items with equal numbers of both types of items randomly presented in 3 blocks of 16 trials each. The "easy" items are so labeled because the target five digit numbers and foils share no common digits (i.e. 46923 and 50187), and thus the correct answer is extremely easy to identify. The "difficult" items are those for which the target numbers and foils are identical with the exception of reversing the middle numbers (i.e. 46923 and 46293). Test-takers see the target number for 5 seconds (s) on the screen followed by a delay of 5s (for block 1), 10s (for block 2), or 15s (for block 3), and then the target number and a foil are presented. The increasing delays before recall across time are thought to increase face difficulty level. As the test-taker is told to choose the target number as quickly and accurately as possible, responses are scored for errors and response latency.

    The VSVT was initially validated using a differential-prevalence design which compared a sample of compensation-seeking (CS) patients and a group of patients not seeking compensation (NCS). The majority of the NCS group was epilepsy surgery patients. After analyzing the test scores using a traditional symptom validity testing significantly "below chance" cutoff and obtaining excellent specificity but modesty sensitivity, Slick et al. (1996) proposed a three-level classification system (valid, questionable, and invalid) in order to increase the VSVT's sensitivity in classifying malingerers. Significantly below chance performance falls in the "invalid" category (e.g., scores < 9 on the easy or difficult items), performance

significantly above chance falls within the "valid" category (e.g., scores > 15 on the easy or hard items), and the additional third category (questionable) applies to scores that fall within the remaining 90% confidence interval around chance performance (e.g., scores between 9 and 15 inclusive on easy or difficult items).

Classification rates based on this three level system suggest that it is moderately effective in classifying malingerers and non-malingerers on the basis of VSVT test scores. Slick et al. (1996) gave percentages of correct classification for each of four groups using the VSVT. One hundred percent of the controls and non-compensation seekers, 85% of the compensation seekers, and 19% of the feigning group were classified as "valid". Fifteen percent of the compensation-seeking group and 81% of the feigning group were classified as either "questionable" or "malingering/invalid". In an independent cross-validation study, Doss, Chelune, and Naugle (1999) found similar classification rates using the VSVT in a general clinical setting with CS and NCS. They found that for the "easy" items, 98% of the NCS patients and 95% of the CS patients had scores in the "valid" range. Conversely, 89% of the NCS group and only 52% of the CS group had "valid" results for the "difficult" items. Eleven percent of the NCS group was classified as either "questionable" or "malingering/invalid".

Grote, Kooker, Garron, Nyenhuis, Smith, & Mattingly (2000) proposed that a 90% correct cutoff was more effective than Slick's original criteria for discriminating CS from NCS groups using the VSVT. VSVT "difficult" memory scores of 16-20 were uncommon among the NCS group in their study, but scores in this range are above chance and considered to be "valid". Their results indicate that the previously suggested cutoff score based on "above chance" performance was too lenient and not adequately sensitive for detecting individuals who were not putting forth their best effort. Grote et al. (2000) proposed that scores in the 16-20 range should not be classified as "valid", as they are rarely seen in patients with brain disease. Applying this revised criteria, two-thirds of the CS group scored below the cutoff, suggesting greater sensitivity. Additionally, using a cutoff of < 21 difficult items correct as indicative of feigning retained adequate specificity in the NCS sample. Thus, with the revised cutting score recommended by Grote et al. (2000), the VSVT appears to be one of the best validated procedures for detecting malingered neurocognitive deficit.

Detecting Feigned Psychiatric Symptoms

In order to diagnose mental disorders, psychologists and other clinicians rely heavily on a

patient's self report of symptoms. Most individuals seeking psychological treatment are thought to try to represent themselves honestly to their clinician. However, if receiving a psychiatric diagnosis potentially leads to monetary compensation, it may increase the likelihood that individuals will fabricate or exaggerate their symptoms. The existence of external incentives for a psychiatric diagnosis is in fact relatively common. For instance, patients can obtain monetary compensation for a psychiatric illness (i.e., SSI) or avoid prison after committing a crime by successfully pleading insanity. The frequency of malingered psychological disorders is not clear. However, previous research suggests that it may occur in as many as 30% to 50% of forensic and compensation-seeking cases (Berry et al., 2002). Given these estimated base rates, it is clear that the honesty of the compensation-seeking test taker must be directly assessed in order to verify reported psychiatric symptoms as authentic.

Malingered psychiatric complaints can be detected in several ways: through behavioral observations, review of available records, or grossly inaccurate self report on standard psychiatric measures. Additional objective data regarding the validity of the test taker's responses are available in two major forms: dedicated malingering measures such as the SIRS and SIMS (see below) and validity scales from multi-scale inventories such as the MMPI-2 (see below). Results from these procedures can increase a clinician's confidence about the validity of the person's self-report, and well-validated measures for detecting malingered psychopathology will be presented next.

Structured Interview of Reported Symptoms (SIRS).

The Structured Interview of Reported Symptoms (SIRS; Rogers, Bagby, & Dickens, 1992) is a structured interview designed to detect malingered psychopathology and other response sets. It has 172 items that contribute to 8 primary scales and 5 supplementary scales. Three of the primary scales focus on very unusual symptom presentations (Rare Symptoms, Symptom Combinations, Improbable and Absurd Symptoms), four assess the range and severity of symptoms (Blatant Symptoms, Subtle Symptoms, Selectivity of Symptoms, Severity of Symptoms) and the last compares Reported versus Observed Symptoms. The questions cover a wide range of psychopathology and symptoms that are unlikely to be true. Scoring is based on a format common for structured interviews, "0" for no endorsement of the symptom, "1" for partial endorsement, and "2" for full endorsement. There are 4 possible global classifications for each primary scale based on a patient's answers; honest, indeterminate, probable [feigning], or

definite [feigning]. The number of primary scales falling in the probable and definite feigning range is the major interpretive index for the SIRS.

The SIRS is a psychometrically strong instrument. The reliability of the SIRS scales appears to be good with mean alpha coefficients of .86 for primary scales and .75 for supplementary scales (Rogers, Gillis, Dickens, & Bagby, 1991; Rogers, Gillis, & Bagby, 1990). In addition, inter-rater reliability for the SIRS is high with a mean of .96 and .98 in two reported studies (Rogers et al., 1991; Rogers, Kropp, Bagby, & Dickens, 1993).

Regarding validity, the overall accuracy of classification for probable feigners based on single primary scale scores is moderately high (between 43.6 - 92.7%) with Symptom Combinations and Improbable and Absurd scales having the lowest accuracy at 70.4% and 43.6% respectively (Rogers et al., 1992).   Given the variable classification rates with individual primary scales, Rogers et al. (1992) recommend using a stringent criterion of 3 out of the 8 primary scales in the "probable feigning" or "definite feigning" range as an indication of feigning in order to minimize false positive classifications. Rogers et al. (1992) indicate that the SIRS classification accuracy using this criterion has moderate sensitivity (48.5%) and excellent specificity (99.5%). The very high specificity rate insures high PPP, which is reassuring to clinicians with reservations about labeling a patient as a malingerer.

The SIRS has been shown to be effective in discriminating between feigners and honest responders in both simulation and known-groups designs. Significant differences in the predicted direction (i.e., feigners had higher scores) were found between simulators and honest responders on all of the primary scales designed to detect feigning (Rogers et al., 1991). The authors also found similar results using independently identified suspected malingerers. Given the high accuracy of the SIRS, it is often used as a "gold standard" for detecting malingering of psychiatric symptoms.

Screening Index of Malingered Symptoms (SIMS).

The SIMS (Smith and Burger, 1997) is a 75-item, true-false screen for feigned psychopathology and cognitive impairment. The SIMS consists of 5 non-overlapping scales that cover different types of feigning; Af (affective disorders), P (psychosis), N (neurological impairment), Li (low intelligence), and Am (amnesia). A total score is also calculated from the raw scores of the 5 scales. Smith and Burger (1997) report a hit rate of 94.5% for the SIMS in discriminating between analog malingerers and honest responders. Rogers, Hinds, and Sewell

(1996) found the SIMS to be moderately effective in identifying feigned protocols. In their study, using a cutoff of total score >16 as an indicator of feigning, the SIMS had a good PPP (.87) and moderate NPP (.62). The authors also provided classification rates using a total score > 40 which increased the NPP to .94 while PPP dropped to .49. In a known-groups design with individuals undergoing pretrial psychological evaluations for competency to stand trial or criminal responsibility, Lewis, Simcox, and Berry (2002) found relatively high NPP (100%) using a SIMS total score cutoff of > 16. In light of the high NPP value, these authors recommend use of the SIMS total score (with a cutoff score larger than 16) as a screening malingering measure.

       Minnesota Multiphasic Personality Inventory-2.

       The Minnesota Multiphasic Personality Inventory (MMPI; Hathaway and McKinley, 1943) was developed to serve as a self report inventory of psychopathology and was one of the first personality measures to include multiple validity scales, and became one of the most widely used and validated psychological tests. The Minnesota Multiphasic Personality Inventory-2 (MMPI-2; Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989) improved upon the original version of the test in several ways such as increasing the representativeness of the standardization sample and changing some of the language in the test that had become obsolete or was sexist.

       The MMPI-2 retained four validity scales carried over from the original version: CS, L, F and K. The Cannot Say (CS) scale represents the total number of items omitted or responded to as both true and false. The Infrequency (F) scale consists of items that were infrequently endorsed by the normative sample ($\leq$ 10% of the sample endorsed the item). Typically, individuals who endorse a high number of these items are attempting to present themselves in an unrealistically negative light, are randomly responding, or are severely disturbed. The Lie (L) scale consists of items denying common flaws or behaviors that most people have engaged in at some point such as telling a white lie or failing to brush their teeth twice a day every day. Individuals elevate this scale when they are attempting to portray themselves in an unrealistically positive light or "faking good". The Correction (K) scale was developed to compensate for individuals trying to mask their level of disturbance. In addition to identifying subtle denial, the correction score derived from this scale is added to several clinical scales in an attempt to compensate for underreporting of symptoms. A fifth validity scale, the F-K scale was created by

taking the raw F scale score (tapping over-reporting symptoms) and subtracting the K scale score (tapping defensiveness). The more positive the resulting score, the more likely the individual is over-reporting his or her symptoms.

In addition to updating language and reducing bias in the item wording, the MMPI-2 also added new validity scales in an attempt to improve the detection of different response styles. The Backpage Infrequency (Fb) scale was developed to address the concern that all of the original F scale items appeared in the first half of the test. The Fb items consist of questions on the last half of the MMPI-2 that were rarely endorsed by the standardization sample. The newer Infrequency Psychopathology (F(p); Arbisi & Ben-Porath, 1995) scale consists of items rarely endorsed by a large sample of psychiatric patients as well as the MMPI-2 standardization sample. Again, individuals who endorse a high number of these items are thought to be feigning their symptoms since even severely psychologically disturbed individuals rarely endorsed these items. The Superlative (S) scale is a new "fake-good" scale which is elevated when the respondent is trying to give an even stronger positive impression compared to the previous "fake-good" scales. The S scale consists of items indicating unrealistically positive presentation of oneself.

In addition to the more traditional validity scales designed to detect overreporting and underreporting of psychiatric symptoms, the MMPI-2 added scales designed to detect inconsistent responding, nay-saying, and yea-saying (Butcher et al., 1989). The Variable Response Inconsistency (VRIN) scale provides an index of how inconsistently an individual responds on the MMPI-2, and it consists of 67 pairs of items with similar or opposite content. Each time a pair is answered inconsistently, a point is added to the VRIN raw score. The True Response Inconsistency (TRIN) Scale provides an indication of the individual's yea-saying (indiscriminant true responses) and nay-saying (indiscriminant false responses). This scale consists of 23 item pairs that have opposite item content. If the individual answers the same for both questions in the pair a point is added or subtracted from the raw score, with higher TRIN raw scores indicating a yea-saying response style, and lower TRIN raw scores indicating indiscriminant nay-saying. VRIN and TRIN are helpful for identifying profiles which are clearly a result of inconsistent or random response styles before examining the traditional validity scales which consist of infrequently endorsed items that may be elevated by this type of responding.

The MMPI-2 has a great deal of research supporting its use as a screening measure for

malingering. Four scales which have been shown to detect over-reporting of symptoms on the MMPI-2 are the F, Fb, F-K, and F(p) scales. Berry and colleagues (2002) summarize information about the 4 feigning indices from multiple studies which suggests that these scales have moderately high sensitivity and specificity. The F-K and F scales had the highest average classification rates in individuals who were malingering (sensitivity values of .84 and .83, respectively). The scale with the highest classification rate in honest responders was F(p) (specificity of .92, with the remaining 3 scales approximately 4-8 percentage points lower). However, given limited PPP values using these scales, Berry et al. (2002) suggested that their use be limited to a screening function.

The MMPI-2 traditional validity scales have been well-established as fairly effective ways to detect psychiatric malingering. While these scales have demonstrated the ability to differentiate individuals malingering psychiatric symptoms from honest patients, they have not been successful at detecting individuals malingering somatic or neurocognitive deficits (Larrabee, 1998).

The Fake Bad Scale for the MMPI-2

As noted in the above sections, the literature and tests used to detect psychiatric and neurocognitive malingering are relatively separate. While the traditional MMPI-2 validity scales (i.e., F, F(p), Fb, and F-K) have been used to detect over-reporting of psychiatric symptoms, they may not have adequate sensitivity for identifying individuals who are feigning in a neuropsychological context.

Larrabee (1998; in press) reports only borderline significant group differences on scales F and Fb between neurocognitive feigners meeting the Slick et al. (1999) criteria and individuals with actual CHI. In addition, F(p) and F-K were not significantly different for the two groups. Greiffenstein, Gola, and Baker (1995) found that F and F-K did not differentiate individuals with traumatic brain injury (TBI) from probable malingerers despite significant group differences on neuropsychological and cognitive malingering measures. Further, in a follow-up study, Greiffenstein, Baker, Gola, Donders, and Miller (2002) found that the traditional MMPI-2 validity scales were insensitive to large group differences in symptom-history conformity. In other words, the traditional fake bad scales do not appear as effective in detecting the feigning that occurs in a neuropsychological context as compared to detecting feigning seen in psychiatric settings.

These results suggest that malingering can occur in two ways during neuropsychological evaluations: as feigned memory impairment and/or exaggerated somatic complaints (Larrabee, 1998). Feigned memory impairment can be identified by using separate, objective measures of neurocognitive malingering which were developed to detect feigned memory deficits by documenting below chance performance or scores below normative groups of non-compensation seeking. Meta-analysis suggests that these tests have empirical support for effectiveness at detecting feigned memory deficit (Vickery, Berry, Inman, Harris, & Orey, 2001). However, in addition to feigned memory deficits, exaggerated somatic complaints can also occur in a neuropsychological assessment. Complaints such as pain, parathesias, and malaise are common. An individual may exaggerate these complaints in order to strengthen his or her claim of impairment. Individuals undergoing personal injury litigation may also be tempted to exaggerate somatic complaints that occur as a result of their emotional distress. Research reviewed above suggests that individuals feigning neurocognitive deficit or somatic complaints answer the MMPI-2 in a manner that goes largely undetected by the "traditional" fake-bad scales (F, Fb, F(p), & F-K).

Fortunately, Lees-Haley and colleagues (Lees-Haley et al., 1991; Lees-Haley, 1992) have developed a validity scale intended to detect malingered somatic symptoms and malingered neurocognitive deficit most often seen in individuals undergoing personal injury litigation or neuropsychological assessment, the Lees-Haley Fake Bad Scale (FBS; Lees-Haley et al., 1991; Lees-Haley, 1992). The FBS was constructed on a rational content basis by reviewing previous unpublished MMPI test data from malingerers (Lees-Haley, 1991). The conceptualization of individuals malingering somatic symptoms is primarily that they portray themselves as (overly) honest people who have suffered an (overly) terrible injury. Lees-Haley chose MMPI items that fit this type of goal-directed behavior thought to be associated with individuals feigning emotional distress, such as trying to: 1) appear honest; 2) appear psychologically normal except for the influence of the alleged cause of injury; 3) avoid admitting pre-existing psychopathology; 4) minimize the impact of previously disclosed pre-existing complaints; 5) hide or minimize pre-injury antisocial or illegal behavior; and 6) present a degree of injury or disability within plausible limits. In other words, this scale was developed to identify individuals who were trying to appear honest and well functioning before an injury, with all problems the person is experiencing solely the result of an injury. In its initial stages of validation, the FBS has some

support in its ability to detect both somatic and malingered neurocognitive deficit with reasonable accuracy.

Multiple lines of evidence suggest that the FBS does not function in the same ways as the traditional MMPI-2 validity scales, in that it is not thought to be sensitive to feigned psychiatric symptoms. In fact the FBS does not have a significant item overlap with the traditional validity scales (only 7 out of 42 items on the FBS overlap with the traditional validity scales). Thus, it would be expected that it would measure something other than psychiatric overreporting and would have lower correlations with the validity scales designed to detect psychiatric feigning. Additionally, the average correlations between the FBS and the traditional fake-bad scales were lower (average $r = .23$) than the average correlations within the traditional fake bad scales (Larrabee, in press). Moreover, in another study, the classification accuracies of F, Fb, F(p), and F-K were superior to the FBS when identifying individuals instructed to respond honestly or to malinger mental illness (Rogers, Sewell, & Salekin, 1994). Thus, the FBS appears to tap a different construct than the traditional fake-bad scales on the MMPI-2 (F, Fb, F(p), & F-K).

While the FBS is thought to be insensitive to feigned psychiatric symptoms, current research suggests that it is more accurate than the traditional validity scales in the detection of malingered neurocognitive deficit (MNCD) or feigned somatic symptoms. For example, the classification accuracy of the FBS has reportedly been high when applied to forensic populations. Lees-Haley et al. (1991) reported sensitivity values of 93% for identified personal injury feigners, 88% for simulators of emotional distress, and specificity values of 83% using an FBS cutoff of > 20. Iverson, Henrichs, Barton, and Allen (2002) also found high sensitivity in identifying prison inmates coached to malinger using a > 20 cutoff, however, the resulting specificity was of concern (up to 30% of the nonmalingering groups were misclassified as malingering). The authors recommended using a cutoff of FBS > 26 in order to reduce the number of false positive errors. The FBS also appears to distinguish feigning of certain specific types of symptoms more effectively than the traditional validity scales. The FBS distinguished simulators feigning neurotic vs. psychotic symptoms with higher accuracy than the traditional MMPI-2 validity scales (Cramer, 1995).

Comparisons of suspected feigning and honestly responding groups also suggest the FBS scores were higher in somatic feigning groups. In a differential-prevalence design, litigating patients and individuals with mild head injuries seeking financial compensation have higher FBS

raw score means than clinical patient groups and groups with documented head injury (Tsushima and Tsushima, 2001). These authors reported that litigating patients had a significantly higher mean (FBS = 20.7) than clinical patients (FBS = 17) and controls (FBS = 11). Additionally, patients with mild head injury seeking financial compensation have higher FBS means and more individuals identified as feigning (using cutoffs of FBS > 20 and 21, respectively) compared to nonlitigating head-injured patients (Greiffenstein, Baker, Gola, Donders, & Miller, 2002; Ross, Millis, Krukowski, Putnam, & Adams, in press).

FBS scores have also been shown to be higher in groups identified as feigning based on independent criteria suggestive of feigned neurocognitive deficits or somatic complaints. Larrabee (in press) reports classification rates for evaluees with documented closed head injury (specificity = 80.77%) compared to individuals identified as *definite* malingerers of neurocognitive deficit (sensitivity = 86.21%) with the FBS. In addition, a logistic regression indicated that the predictive accuracy of the FBS was beyond that accounted for by other MMPI-2 validity and clinical scales for detecting malingered neurocognitive deficits. Larrabee (in press) found the best overall classification accuracy was achieved using a cutoff score of FBS > 22.

Despite the positive findings which support the ability of the FBS to detect feigning seen in personal injury or neuropsychological settings, there has been some concern about its utility. Recently, Butcher and colleagues have raised questions regarding the construct validity of the FBS and its efficacy in detecting feigning (Butcher, Arbisi, Atlis, & McNulty, 2003). In a review of the current studies on the efficacy of the FBS they conclude that the number of false positives yielded by this scale is unacceptably high. In addition, they believe that the focus of the scale on somatic complaints instead of rare symptoms may not differentiate malingerers from bona fide patients. Butcher et al. (2003) suggest future studies examine the efficacy of the FBS using known groups where there is more confidence in the classification of the patient as malingering or honest. Thus although, the FBS appears to be the most promising MMPI-2 validity scale for detecting MND, and other types of malingering such as somatic malingering most often seen in neuropsychological and personal injury settings, concerns have been raised by some authors about its specificity rates.

Purpose of the Present Study

Past research using the FBS suggests that it shows promise as a way to detect malingered

neurocognitive deficit using the MMPI-2, a commonly used measure of psychopathology, whereas the traditional MMPI-2 validity scales are well-supported for the detection of malingered psychiatric symptoms. However, thus far, there has not been a study examining the FBS's accuracy when directly comparing individuals who are malingering somatic or neurocognitive deficits (such as those seen in personal injury or head injury litigation) with individuals who are malingering psychiatric symptoms (such as in workers' compensation claims of psychological disability). Thus, given the relatively separate nature of research on psychiatric and cognitive malingering, the purpose of the present study is to evaluate the classification accuracy of the FBS using a known-groups design. Specifically, a group of identified psychiatric malingerers will be compared with groups of identified malingering neurocognitive deficits and identified honest responders.

A forensic sample of 180 personal injury and head injury claimants and workers' compensation cases was divided into 5 groups on the basis of scores on objective psychiatric and neurocognitive malingering measures: (1) feigning psychiatric symptoms only, 2) feigning neurocognitive/somatic symptoms only, 3) feigning both psychiatric and neurocognitive symptoms, 4) honest responders and 5) indeterminate responders. Cases with indeterminate classification on one or both types of malingering were excluded from analysis as the nature of their response style was considered uncertain.

After the four clinical groups of interest were identified, the MMPI-2 validity scale results were compared in order to determine which scales best differentiated the groups. The traditional validity scales (F, Fb, F(p), and F-K) were expected to be most effective at identifying the psychiatric feigning group. The FBS was predicted to be most effective at identifying the NCF and PSY/NCF groups.

Chapter Two

Method

<u>Participants</u>

The participants initially included 180 consecutive patients evaluated at the Lexington Forensic Institute who signed an IRB approved consent form for the anonymous use of their data. They included 94 workers' compensation cases and 86 head injury cases. The former group was undergoing psychological assessments in order to determine level of psychological damage from an alleged injury experienced at work. The latter group was undergoing neuropsychiatric assessment to determine level of brain damage and/or psychological damage as a result of an alleged head injury.

Of the initial 180 cases, 8 did not receive the MMPI-2. Remaining MMPI-2 results were screened for the Cannot Say raw score exceeding 29 (1 participant excluded) and VRIN T-score >80 (1 participant excluded). No cases were excluded on the basis of TRIN > 100. The 170 remaining participants were classified as a psychiatric feigner (PSY), neurocognitive feigner (NCF), feigning both psychiatric and neurocognitive symptoms (PSY/NCF), honest (HON), or indeterminate (I) based on their responses on the previously mentioned objective malingering tests: SIRS, LMT, VSVT, TOMM, and in some cases, the SIMS. Systematic rules were developed to allow initial classification of each participant as feigning, honest, or indeterminate for each type of malingering (e.g., psychiatric or neurocognitive). In a final stage, the possibility of combined types of feigning was addressed.

The psychiatric feigning group (PSY) was determined primarily using the SIRS. Individuals were classified as feigning psychological symptoms if at least 3 out of the 8 primary scales were in the "probable feigning" or "definite feigning" range. An individual was classified as psychiatric honest (or not feigning psychiatric symptoms) if at least 6 out of the 8 primary scales were identified as being in the "honest" range, and no scales were in the "probable feigning" or "definite feigning" range. All other SIRS results were classified as indeterminate on psychiatric feigning status. Forty of the evaluees classified as indeterminate by the SIRS had been administered the SIMS in addition to the other malingering measures. In these cases, if the individual failed the SIMS (total score > 40), he or she was classified as feigning psychiatric symptoms. If the individual who was indeterminate passed the SIMS, then he or she remained classified as indeterminate. If an individual was classified as a psychiatric feigner and was not

classified as a neurocognitive feigner (see below), he or she became part of the psychiatric feigning only group (PSY).

The neurocognitive feigning group (NCF) was determined using the three tests of neurocognitive malingering mentioned above; the LMT, the TOMM, and the VSVT. Individuals were classified as feigning if at least two out of the three test results were indicative of feigned neurocognitive deficits (LMT < 93%, TOMM < 90% on Trial 2, VSVT < 21 "difficult" items correct). Individuals who were identified as responding honestly on all 3 (the LMT, TOMM, and VSVT) were considered to be honest responders in regards to neurocognitive feigning status. Individuals who were classified as feigning on only one of the three motivational tests were classified as indeterminate for neurocognitive feigning status. Individuals who were classified as feigning on at least two out of the three tests (LMT, TOMM, and/or VSVT) and identified as honest or indeterminate on the SIRS (and SIMS where applicable) were classified as neurocognitive feigners only (NCF).

The psychiatric and neurocognitive feigning group (PSY/NCF) included those individuals who were classified as feigning on the psychiatric malingering measures (SIRS, and SIMS when applicable) and identified as feigning on at least two out of the three neurocognitive malingering tests (LMT, TOMM, & VSVT).

Individuals were identified as Indeterminate (I) if they were classified as indeterminate on the SIRS (and subsequently passed the SIMS), identified as feigning on only one of the neurocognitive malingering tests (LMT, TOMM, & VSVT), or identified as indeterminate by the SIRS and identified as feigning on only one of the neurocognitive malingering tests (LMT, TOMM, VSVT). Honest responders (HON) were those who were classified as honest on the SIRS, LMT, TOMM, and VSVT.

Of the 170 participants with valid MMPI-2 data, 54 passed the SIRS, LMT, VSVT, & TOMM and were classified as honest responders (HON). Nine participants failed the SIRS or were classified as indeterminate on the SIRS but failed the SIMS, and passed at least 2 neurocognitive malingering tests. These 9 individuals were identified as psychiatric feigners (PSY). Forty participants failed at least 2 of the neurocognitive malingering tests, and passed or were classified as indeterminate by the SIRS (and then passed the SIMS). These individuals were identified as neurocognitive feigners (NCF). Seventeen participants failed the SIRS and failed at least 2/3 neurocognitive malingering tests. These individuals formed the psychiatric and

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neurocognitive feigning group (PSY/NCF). Fifty participants were classified as indeterminate on the SIRS (and passed the SIMS if applicable) and failed only one neurocognitive malingering test. These individuals were classified as Indeterminate (I), and excluded from further analysis.

Materials

The short, standard psychological battery of tests that was administered to individuals undergoing a worker's compensation evaluation included the MMPI-2, Behavioral Health Inventory, and Kaufman Brief Intelligence Test.

The standard neuropsychological battery of tests given to individuals undergoing a head injury evaluation included the Wechsler Adult Intelligence Scale-III, Wechsler Memory Scale-III, Boston Naming Test, Controlled Word Association Test (COWA), Reitan-Klove Sensory Perception Test, Finger Tapping Test, Grip Strength Test, Grooved Pegboard, Wisconsin Card Sorting Test (WCST), Brief Test of Attention (BTA), and the MMPI-2.

Malingering tests given to all evaluees were the SIRS, TOMM, LMT, and VSVT. A subset also completed the SIMS.

Procedure

Each evaluee was interviewed by the evaluating psychiatrist and received a psychological or neuropsychological battery of tests administered by 1 of 4 certified Master's level clinicians (supervised by a licensed clinical psychologist). Each individual was also given psychiatric (SIRS, and sometimes the SIMS) and neurocognitive malingering tests (LMT, TOMM, and VST) using standard procedures as part of the test battery.

After the reports were written, files were reviewed to identify evaluees who had given consent for archival use of their data. RA1 deleted identifying information and printed out copies of reports from the consenting participants. RA2 coded demographic and test information. Honest, indeterminate, and feigning groups were determined by review of results from the psychiatric malingering test and the neurocognitive malingering tests as described earlier. Results from participants classified as indeterminate were removed from further consideration.

Chapter Three

Results

Descriptives

As previously noted, the number of participants classified in each study group was HON = 54, PSY = 9, NCF = 40, and PSY/NCF = 17. Table 1 presents demographic characteristics for the 4 study groups. One-way ANOVA or Π^2 analyses, as appropriate, indicated that there were no significant differences between the groups on the demographic variables of age ($M = 42.3$, $SD = 10.9$), $F(3, 119) = 1.589$, $p = .196$; education ($M = 12.0$, $SD = 2.6$), $F(3, 119) = .333$, $p = .802$; gender (ranged from 66.7% male in the PSY group to 77.8% in the HON group, $\Pi^2 = .909$), ethnicity (percentage of white participants ranged from 96.3% - 100%, $\Pi^2 = .932$), and handedness (most of the participants were right handed, ranging from 83.3% - 90.0%, $\Pi^2 = .839$) between the groups. A further analysis, including data from the I group (not shown in Table 1), showed no significant difference on any demographic variables.

Main Analyses

Group Differences for MMPI-2 Clinical Scales

To determine whether the 4 study groups presented with different self reports of psychopathology, an initial multivariate analysis of variance (MANOVA) was performed on the 10 clinical scales from the MMPI-2 by group. Results indicated a significant overall effect (Wilks' $7 = .280$, $F(30, 314.74) = 5.70$, $p < .01$).

Table 2 presents the mean MMPI-2 clinical scale results for the honest and feigning groups as well as findings from univariate ANOVA tests. One-way ANOVAs were statistically significant for all 10 clinical scales. Therefore, Tukey's HSD post-hoc comparisons with $\forall$ set at .05 were undertaken. Not surprisingly, results from the follow-up tests indicated that the HON group was significantly lower than all 3 feigning groups on every clinical scale. The lone exception was scale 9 where both the HON and NCF groups had statistically significantly lower mean T-scores than the PSY/NCF group. Additionally, clinical scale T-scores for the PSY & PSY/NCF groups were generally higher than for the NCF group, with the NCF group typically intermediate between the HON group and the PSY & PSY/NCF feigning groups. However, only on scales 4, 6, & 8 were the PSY & PSY/NCF groups statistically significantly higher than the NCF group.

Table 3 presents the differences between each of the feigning groups and the HON group

for all 10 of the MMPI-2 clinical scales using Cohen's *d* (Cohen, 1977), which expresses the differences between groups standardized in pooled standard deviation units. The PSY group had the largest average *d* at 1.55 and the PSY/NCF group was a close second with $d = 1.48$. The NCF group had a moderate average effect size at .86. Thus overall, all 3 feigning groups endorsed more psychopathology than the HON group. However, the two groups identified as feigning psychopathology on the SIRS and/or SIMS endorsed more symptoms than the NCF group. These results suggest that the group selection criteria resulted in roughly the expected stratification in level of reported psychopathology.

Group Differences for MMPI-2 Validity Scales

To determine whether the 3 groups of feigning participants presented with different response sets compared to the HON group and each other, an initial multivariate analysis of variance (MANOVA) was run on the validity scale data from the MMPI-2 by group. Results indicated a significant overall effect, Wilks's $7 = .317$, $F(24, 313.83) = 6.36$, $p < .01$.

Table 4 presents the mean MMPI-2 validity scale results for the honest and 3 feigning groups as well as findings from univariate ANOVA tests. Considering the "traditional" fake bad validity scales first, the one-way ANOVAs were statistically significant for all 4. Thus, Tukey's HSD post-hoc comparisons were undertaken with ∀ set at .05. As expected, the HON group had significantly lower scores on the traditional "fake-bad" validity scales (F, Fb, F(p), and F-K) than all 3 feigning groups. In addition, the NCF group had significantly lower scores than the PSY/NCF group on all 4 traditional fake bad scales and significantly lower scores than the PSY group on the validity scales F and F-K. In a pattern similar to that seen in the clinical scale results, on the traditional "fake bad" validity scales the HON group scores are the lowest, with the NCF group generally scoring intermediate between the HON group and the PSY & PSY/NCF groups. Overall, the two groups identified as feigning psychopathology on the SIRS and /or SIMS have the highest MMPI-2 validity scale scores.

Regarding the performance of the four groups on the FBS, a one-way ANOVA was also statistically significant. Based on Tukey's HSD test, the HON group's score was significantly lower on the FBS than all 3 feigning groups, which were not significantly different from one another. These results suggest that the FBS is sensitive to feigning, but not specific to neurocognitive feigning. The PSY/NCF group had the highest FBS score, the PSY had the next highest, and the NCF group had the lowest FBS score of the 3 feigning groups, although the

mean FBS scores for all these scores were rather close.

Because Lees-Haley (1992) suggested that certain types of faking good were common in TBI feigning, it may be also worth reviewing the "fake good" scales in Table 4. The scores for the four groups on the MMPI-2 "fake good" validity scales were markedly different than the previous pattern of scores seen on the clinical and "fake bad" validity scales. One-way ANOVAs were statistically significant for scales K and S, but not for L. Tukey's HSD post-hoc comparisons with $\forall$ set at .05 were undertaken for scales K and S. The HON and NCF groups obtained significantly higher scores than the PSY and PSY/NCF groups for scales K and S. This supports Lees-Haley's suggestion that NCF may involve elements of faking good.

Table 5 presents the differences between each of the feigning groups and the HON group for all of the MMPI-2 validity scales using Cohen's d. For the traditional "fake bad" scales, the PSY/NCF group had the largest mean effect size of 2.59 and the PSY group was next with a mean effect size of 2.07 (means not shown in Table 5). Although the NCF group has lower average effect sizes than the PSY and PSY/NCF groups, it did have higher scores on the fake-bad validity scales than the HON group with a mean effect size of 1.02. For the traditional MMPI-2 fake bad scales, the group selection criteria again produced roughly the expected stratification. Somewhat unexpectedly, the PSY/NCF group had the largest effect size for the FBS ($d = 1.46$), the PSY group had then next largest effect size ($d = 1.36$), and the NCF group had the lowest effect size ($d = 1.23$).

Additionally, Table 5 presents the differences between the feigning groups and the HON group for the K & S scales using Cohen's d. NCF results for K and S were much closer to the HON group, with the PSY and PSY/NCF groups most discrepant. These results suggest that the HON and NCF groups appear to have been engaging in more positive impression management than the PSY and PSY/NCF groups.

Classification Rates for MMPI-2 Validity Scales

Table 6 presents the classification parameters for the traditional MMPI-2 "fake bad" validity scales and the FBS for the honest and 3 feigning groups using standard cutting scores recommended in the literature and reviewed earlier. With the exception of the Fb scale, the sensitivity values for the traditional validity scales were generally unacceptably low for all 3 types of feigning. The Fb scale had the only acceptable sensitivity values at .75 for both the PSY & PSY/NCF groups and .67 for the NCF group. In contrast, specificities for all 3 feigning

groups using the traditional "fake-bad" validity scales were extremely high with an average value of 98.5%. Overall, the only traditional MMPI-2 faking index supported here is Fb (median sensitivity = .71, median specificity = 1.00).

<u>Classification Rates for FBS at Different Cutting Scores</u>

Regarding the FBS, it is also noteworthy that its sensitivity for identifying individuals feigning neurocognitive and/or psychiatric deficits (using a raw score of 22 as a cutoff) is generally much higher than for the traditional "fake-bad" scales. The FBS had the highest rate of classifying individuals in the PSY group with a sensitivity of 100%. The FBS had slightly less but still very good accuracy at classifying individuals in the NCF and PSY/NCF groups (sensitivity = 95% and 88%, respectively). In contrast to the high sensitivity values, the specificity of the FBS was disappointingly low at 50% across all 3 types of feigning, which will sharply limit its PPP in most settings, as shown in Table 6. Consistent with prior research using the FBS, this scale does appear to be the most sensitive scale for detecting neurocognitive feigning (sensitivity for FBS scale = 95%, whereas the largest sensitivity value for this group with the traditional "fake-bad" scales was 67% for Fb). However, the sensitivity rates for the FBS are as high if not higher in the PSY and PSY/NCF groups (sensitivity = 100% and 88%, respectively). Thus, although the FBS is more sensitive than the traditional "fake-bad" scales for detecting neurocognitive feigning, it also appears to be more sensitive to psychiatric and psychiatric and neurocognitive feigning as well, suggesting that it is not specifically sensitive to NCF. In fact, the Fb scale slightly outperformed the FBS scale in overall hit rated for discriminating NCF from HON participants. It is also worth noting again that the specificity rates for FBS were quite modest across all types of feigning.

In order to explore the potential utility of the FBS further, Table 7 presents the classification rates for the FBS at a variety of alternative cutoff scores suggested in the literature. Generally, the sensitivity and specificity values for the 3 feigning groups are similar for each cutoff. The cutting score that yielded the highest sensitivity for the 3 feigning groups was an FBS raw score > 20 (average sensitivity value at this cutting score was 99%). However, the specificities at this cutting score were unacceptably low at 32%. The highest specificity occurred using a cutoff of > 30 at 96%. However, at this cutoff score the sensitivity values for the feigning groups were unacceptably low with an average sensitivity of 34%. The cutoff score of > 24 for men and 26 for women appears to have the most accurate classification rates overall. For

men, this cutoff yielded an average sensitivity of 84% for the 3 groups and a specificity of 67%. The hit rate was .77 for the PSY group, .73 for the PSY/NCF group, and .47 for the NCF group. For women, the cutoff produced sensitivity values averaging 85% and specificity values of 75%. The hit rates for the 3 feigning groups were .84 for the PSY/NCF group, .67 for the PSY group, and .62 for the NCF group.

Chapter Four

Discussion

Using a known-groups design, this study examined the efficacy of the Lees-Haley FBS and traditional MMPI-2 fake-bad scales for identifying psychiatric, neurocognitive, and combined psychiatric and neurocognitive feigners. Criterion status (presence or absence of feigned psychiatric symptoms and/or cognitive deficits) was established through the use of multiple well-validated procedures, suggesting that the study groups were very likely to have the target response sets (or be free of them). The major findings of this study can be summed up in 3 main points. First, most of the MMPI-2 traditional validity scales were not particularly effective in detecting malingered symptoms (psychiatric, neurocognitive, or both) in this setting. Second, of the traditional validity scales, the Fb scale had the highest overall classification accuracy for all three types of feigning. Finally, the FBS, which was the primary focus of this study, had the highest sensitivity of all scales, but its specificity was unacceptably low. Each of these points will now be addressed in more detail.

How effective are the traditional MMPI-2 "fake bad" scales in detecting feigning?

The F, F(p), and F-K traditional fake-bad scales were not shown to have adequate classification accuracy for detecting psychiatric, neurocognitive, or combined psychiatric and neurocognitive feigning in this setting. For the F scale, using an established T-score cutoff of > 107, the highest hit rate was found for the PSY/NCF group at .86, the hit rate for the PSY group was .74, and the lowest hit rate occurred in the NCF group at .65. Using a cutoff of T > 100, the F(p) scale resulted in the highest hit rate for the PSY/NCF group at .82, the PSY group had the next highest hit rate of .70, and the NCF group had the lowest hit rate at .64. For the F-K scale, a raw score cutoff of > 10 obtained the highest hit rate in the PSY/NCF group (.86), the next highest was for the PSY group (.76), and the lowest hit rate was obtained in the NCF group (.64). Generally the hit rates for each of the 3 types of feigning groups were consistent across F, F(p), and F-K. Specifically, the PSY/NCF group was most accurately identified by these validity scales, the PSY group the next most accurately identified, and the NCF classification rate was the lowest. The mediocre performance of the F scale is contrary to previous literature on the effectiveness of the traditional MMPI-2 validity scales. The F scale has been reported in a recent meta-analysis of the MMPI-2 to be the most effective indicator of feigning psychological symptoms (mean $d = 4.05$) (Rogers et al., 2003). Also, although the PSY/NCF and PSY groups

were consistently detected with moderate accuracy by the traditional validity scales, the difference in detection accuracy for psychiatric vs. neurocognitive feigning by the traditional MMPI-2 validity scales here does not appear to be a large as previous research has reported (Larrabee, in press; Greiffenstein et al., 1997; Greiffenstein et al., 1995).

The relative success of the MMPI-2 Fb scale in detecting feigning in this study.

For all 3 feigning groups, the highest relative hit rates were obtained using the Fb scale. At a T-score cutoff of > 108, Fb had the highest hit rate for the PSY/NCF group at .97, a hit rate of .87 for the PSY group, and .69 for the NCF group. Fb's superiority here is inconsistent with much research on the relative effectiveness of each the traditional MMPI-2 validity scales. In fact, the latest meta-analysis of MMPI-2 validity scales questioned the effectiveness of the Fb scale for detecting feigned psychological deficits, stating that bona fide patients often elevate this scale ($M = 71.34$) and show considerable variation in Fb scores (Rogers, et al. 2003). In addition, the NCF group was classified more accurately by the Fb scale than the FBS which is directly contradictory of past reports (Greiffenstein et al., 1997). However, Lewis et al. (2002) found Fb to be the best predictor of feigning in forensic evaluees studied in a known-groups design.

How effective was the FBS in differentiating psychiatric and neurocognitive feigners?

Finally, the FBS unexpectedly appears to significantly differentiate honest responders from all 3 types of feigners. The HON group had the lowest mean raw FBS score (22.3), while the 3 feigning groups' scores were considerably higher, although not significantly different from each other (average FBS score = 28.8). Thus, although the FBS was designed to detect somatic & neurocognitive feigning, it did not distinguish between psychiatric and neurocognitive feigners in the present sample. In addition, the mean raw score for a carefully defined honest group (passing both psychiatric and neurocognitive malingering measures) is higher than previously reported means from students and clinical samples. The cause of this discrepancy is unclear. It may be due to higher symptom reporting in a litigation context, and thus, may not be exclusively indicative of feigning. Although classification rate data indicated that the FBS has higher sensitivity to neurocognitive and/or psychiatric feigners than most of the traditional "fake-bad" validity scales, the specificity of the FBS was much lower (50%) than that for the traditional fake-bad scales (average specificity = 99%), raising concerns about false positive results. Overall, there does not appear to be a significant difference in the detection of neurocognitive

feigning compared to psychiatric feigning using the FBS. This is contrary to previous literature which suggested that the FBS scores was particularly effective for identifying individuals feigning neurocognitive deficits while the traditional validity scales were not (Larrabee, in press; Greiffenstein et al., 1997; Greiffenstein et al., 1995). However, it is important to note that this is the first study that examined different types of feigning in an actual forensic setting and compared their scores to an honest group using strict objective measures to determine feigning status as well as honest responding. Previous research has generally examined mean FBS difference between one feigning group compared to an honest group and reported differences (which the present findings also support).

Study Limitations

Limitations of the present study include the ceiling placed on the validity of all the MMPI-2 scales by the accuracy of the criterion malingering measures (SIRS, SIMS, LMT, TOMM, and VSVT) used to establish psychiatric and neurocognitive feigners. Future studies should use a multimethod approach to define criterion status. In addition, a general limitation of using a known-groups design is the lack of information regarding whether the individuals detected as feigning are so identified because they are blatant feigners. In addition, there are no well-validated measures of somatic malingering to identify this group in the known-groups design. Perhaps an examination of the existing measures which have been used to identify Pseudo-PTSD and other forms of exaggerated somatic complaints or emotional distress might provide a method to examine purely somatic feigners' responses on the FBS.

Conclusions

Overall, the present results do not support the efficacy of the FBS for differentiating between individuals feigning psychological symptoms and neurocognitive deficits. Future research on the FBS may include an item analysis of MMPI-2 to identify items that distinguish the NCF group from the other groups (HON, PSY, & PSY/NCF). The trend of the NCF group to endorse more items than the HON group on traditional "fake-bad" scales and to endorse more items than the PSY and PSY/NCF group on the "fake good" scales K and S may be a starting point for a set of MMPI-2 items that would differentiate the neurocognitive (or somatic symptom) feigners from honest responders and psychiatric feigners. For instance, a scale with both types of items (fake good and fake bad) might have individuals feigning neurocognitive deficits/somatic symptoms endorsing almost two times as many items.

This is the first known-groups design used to validate the FBS scale with multiple types of malingering, and it illustrates the importance of using this type of design in several ways. First, the validity scale scores for the objectively identified malingering groups were lower than proposed cutoffs for the F, Fb, F(p), and F-K scales as is also evident in the low sensitivity rates for the 3 feigning groups. One possible explanation is that some of the cutoff scores were developed based on simulation study results which typically use college students as participants. Another issue is that since all of the participants were involved in a forensic evaluation which could lead to compensation, they may have been coached or instructed by their attorneys not to "overdo it" on the MMPI-2, thus lowering the sensitivity of the scales. Finally, although this study has supported the existence of 3 different feigning groups with different response styles; more research is needed regarding the different types of feigning and optimum detection strategies. Further research using known-groups designs may be helpful to address these issues.

Appendix

Table 1

<u>Demographic Information</u>

			Group		
	HON	PSY	NCF	PSY/NCF	
Variable	(N = 54)	(N = 9)	(N = 40)	(N = 17)	
Age					
M	42.3	38.9	42.9	42.7	
SD	12.6	9.1	10.2	7.4	
Education					
M	12.6	11.7	11.7	11.3	
SD	3.2	2.2	2.1	1.4	
Male (%)	77.8	66.7	75.0	76.5	
White (%)	96.3	100.0	97.5	100.0	
Right (%)	83.3	88.9	90.0	88.2	

Note. HON = Honest Responders; PSY Psychiatric Feigners; NCF = Neurocognitive Feigners; PSY/NCF = Psychiatric and Neurocognitive Feigners. Age and education given in years. Male = percentage of group of male gender; White = percentage of group of Caucasian ethnic background; Right = percentage of group reporting right hand dominance; There were no significant differences between the groups for any demographic variable.

Table 2

MMPI-2 Clinical Scale T-score Data

Clinical Scale T-score		HON (N = 54)	PSY (N = 9)	NCF (N = 40)	PSY/NCF (N = 17)	P
1	M	74.3^{abc}	90.2^a	87.1^b	91.4^c	.000
	(SD)	(13.8)	(8.2)	(9.5)	(7.9)	
2	M	75.2^{abc}	97.3^a	91.0^b	90.5^c	.000
	(SD)	(13.5)	(7.0)	(13.0)	(9.7)	
3	M	73.8^{ab}	84.0	89.8^a	89.3^b	.000
	(SD)	(16.4)	(10.0)	(13.7)	(13.2)	
4	M	54.1^{abc}	73.9^{ad}	63.6^{bde}	74.5^{ce}	.000
	(SD)	(10.4)	(8.5)	(9.6)	(10.5)	
5	M	46.4^a	53.3	48.6	54.6^a	.019
	(SD)	(10.2)	(9.5)	(9.0)	(9.2)	
6	M	54.1^{abc}	95.1^{ad}	68.6^{bde}	84.8^{ce}	.000
	(SD)	(14.8)	(12.9)	(16.4)	(18.7)	
7	M	69.2^{abc}	93.8^a	86.0^b	95.7^c	.000
	(SD)	(14.6)	(4.1)	(14.5)	(8.4)	
8	M	63.9^{abc}	100.0^{ad}	86.0^{bde}	102.5^{ce}	.000
	(SD)	(15.2)	(6.7)	(14.5)	(10.4)	
9	M	47.6^a	55.2	49.1^b	60.5^{ab}	.015
	(SD)	(10.9)	(5.8)	(11.3)	(14.2)	
0	M	60.0^{abc}	80.3^a	71.5^b	80.1^c	.000
	(SD)	(11.8)	(7.3)	(11.8)	(7.5)	

Note. P = probability for ANOVA term; [a-e] means with the same trailing letters differ significantly from each other using Tukey's HSD test.; HON = Honest Responders; PSY Psychiatric Feigners; NCF = Neurocognitive Feigners; PSY/NCF = Psychiatric and Neurocognitive Feigners; MMPI-2 = Minnesota Multiphasic Personality Inventory-2.

Table 3

MMPI-2 Clinical Scale Effect Size Data

Clinical Scale	PSY (N = 9)	NCF (N = 40)	PSY/NCF (N = 17)
Effect Sizes Compared to Honest Group in Cohen's *d*			
1	1.20	1.05	1.20
2	1.72	1.19	1.20
3	.65	1.04	.99
4	1.95	.94	1.96
5	.34	-.28	-.06
6	2.81	.94	1.94
7	1.80	1.15	1.97
8	2.51	1.48	2.71
9	.73	.14	1.10
0	1.79	.97	1.83
mean *d* for clinical scales	1.55	.86	1.48

Note. *d* = Cohen's *d* ; PSY = Psychiatric Feigners; NCF = Neurocognitive Feigners; PSY/NCF = Psychiatric and Neurocognitive Feigners; MMPI-2 = Minnesota Multiphasic Personality Inventory-2.

Table 4

<u>MMPI-2 Validity Scale T-score Data</u>

Validity Scale T-score		HON (N = 54)	PSY (N = 9)	NCF (N = 40)	PSY/NCF (N = 17)	*P*
FBS (raw)	M (SD)	22.3^{abc} (4.9)	29.1^{a} (5.6)	28.0^{b} (4.2)	29.2^{c} (4.5)	.000
F-K (raw)	M (SD)	-7.5^{abc} (9.5)	9.0^{ad} (11.5)	$-.9^{bde}$ (8.8)	11.7^{ce} (6.9)	.000
F	M (SD)	54.6^{abc} (14.1)	90.2^{ad} (12.7)	76.5^{bde} (16.1)	99.5^{ce} (15.1)	.000
Fb	M (SD)	58.6^{abc} (18.9)	108.9^{a} (12.9)	83.6^{bd} (22.0)	113.4^{cd} (13.8)	.000
F(p)	M (SD)	49.0^{abc} (9.4)	61.9^{a} (14.0)	56.7^{bd} (13.5)	72.5^{cd} (17.4)	.000

Table 4 continued: MMPI-2 Validity Scale T-score Data

Validity Scale		HON	PSY	NCF	PSY/NCF	
T-score		(N = 54)	(N = 9)	(N = 40)	(N = 17)	
						P
L	M	59.6	52.9	59.2	56.2	.358
	(SD)	(11.1)	(19.9)	(11.2)	(9.9)	
K	M	49.4[ab]	34.3[ac]	46.9[cd]	36.7[bd]	.000
	(SD)	(10.9)	(11.3)	(11.6)	(6.4)	
S	M	49.7[ab]	32.9[ac]	47.7[cd]	36.1[bd]	.000
	(SD)	(10.8)	(16.9)	(12.4)	(8.3)	

Note. *P* = probability for ANOVA term; [a-e] indicate group means that are significantly different using Tukey's HSD test; HON = Honest Responders; PSY Psychiatric Feigners; NCF = Neurocognitive Feigners; PSY/NCF = Psychiatric and Neurocognitive Feigners; MMPI-2 = Minnesota Multiphasic Personality Inventory-2; *F* = Infrequency; *Fb* = Backpage Infrequency; *F(p)* = Infrequency Pathology; *F-K* = Infrequency minus Correction; *L* = Lie; *K* = Correction; *S* = Superlative.

Table 5

MMPI-2 Validity Scale Effect Size Data

	PSY	NCF	PSY/NCF
Validity Scale	(N = 9)	(N = 40)	(N = 17)
Effect Sizes Compared to Honest Group in Cohen's *d*			
FBS	1.36	1.23	1.46
F-K	1.69	.72	2.14
F	2.56	1.46	3.13
Fb	2.76	1.23	3.07
F(p)	1.27	.68	2.00
L	-.53	-.04	-.31
K	-1.38	-.22	-1.27
S	-1.43	-.17	-1.32

Note. *d* = Cohen's *d* ; PSY = Psychiatric Feigners; NCF = Neurocognitive Feigners; PSY/NCF = Psychiatric and Neurocognitive Feigners; MMPI-2 = Minnesota Multiphasic Personality Inventory-2; *F* = Infrequency; *Fb* = Backpage Infrequency; *F(p)* = Infrequency Pathology; *F-K* = Infrequency minus Correction; *L* = Lie; *K* = Correction; *S* = Superlative.

Table 6

Classification Rates for MMPI-2 Validity Scales

Scale and cutting score	Group	Sensitivity	Specificity	HR	PPP	NPP	BR
F							
>107	PSY	.11	1.00	.74	1.00	.73	.30
	NCF	.05	1.00	.65	1.00	.64	.37
	PSY/NCF	.29	1.00	.86	1.00	.86	.19
Fb							
>108	PSY	.75	1.00	.87	1.00	.84	.30
	NCF	.67	1.00	.69	1.00	.67	.37
	PSY/NCF	.75	1.00	.97	1.00	.96	.19
F(p)							
>100	PSY	.00	1.00	.70	.00	.70	.30
	NCF	.03	1.00	.64	1.00	.63	.37
	PSY/NCF	.06	1.00	.82	1.00	.82	.19

Table 6 continued: Classification Rates for MMPI-2 Validity Scales

Scale and cutting score	Group	Sensitivity	Specificity	HR	PPP	NPP	BR
F-K							
>10	PSY	.33	.94	.76	.72	.77	.30
(raw)	NCF	.13	.94	.64	.57	.64	.37
	PSY/NCF	.53	.94	.86	.69	.89	.19
FBS							
>22	PSY	1.00	.50	.65	.46	1.00	.30
(raw)	NCF	.95	.50	.67	.53	.94	.37
	PSY/NCF	.88	.50	.57	.30	.95	.19

Note. BR = base rate, percentage of individuals in sample who were malingering; Sensitivity = percentage of individuals in group falling below cutting score; Specificity = percentage of individuals in honest group falling above cutting score; HR = hit rate, percentage of both groups correctly classified by cutting score; PPP = positive predictive power, percentage of those with positive test sign who were malingering; NPP = negative predictive power, percentage of those with negative test sign who were not malingering; PSY = Psychiatric Feigners; NCF = Neurocognitive Feigners; PSY/NCF = Psychiatric and Neurocognitive Feigners; MMPI-2 = Minnesota Multiphasic Personality Inventory-2; F = Infrequency; Fb = Backpage Infrequency; F(p) = Infrequency Pathology; *F-K* = Infrequency minus Correction; L = Lie; K = Correction; S = Superlative; FBS = Fake Bad Scale.

Table 7

Classification Rates for FBS at Different Cutting Scores

FBS (raw) Citation and cutting score		Sensitivity	Specificity	HR	PPP	NPP	BR
	Group						
(Lees-Haley et al., 1991)							
FBS > 20	PSY	1.00	.32	.72	.62	.81	.40
	NCF	.98	.32	.57	.44	.77	.36
	PSY/NCF	1.00	.32	.77	.47	.92	.21
(Larrabee, in press)							
FBS > 22	PSY	1.00	.50	.65	.46	1.00	.30
	NCF	.95	.50	.67	.53	.94	.37
	PSY/NCF	.88	.50	.57	.30	.95	.19
(Miller and Donders, 2001)							
FBS > 23	PSY	.88	.61	.69	.49	.92	.30
	NCF	.80	.61	.68	.55	.84	.37
	PSY/NCF	.88	.61	.66	.35	.96	.19

FBS (raw) Citation and cutting score	Group	Sensitivity	Specificity	HR	PPP	NPP	BR
(Lees-Haley, 1992)							
FBS > 24 (all)	PSY	.88	.61	.69	.49	.92	.30
	NCF	.80	.61	.68	.55	.84	.37
	PSY/NCF	.88	.61	.66	.35	.96	.19
(Iverson, et al., 2002)							
FBS > 26 (all)	PSY	.63	.74	.71	.51	.82	.30
	NCF	.63	.74	.70	.59	.77	.37
	PSY/NCF	.77	.74	.75	.41	.93	.19
(Larrabee, in press)							
FBS > 30	PSY	.25	.96	.60	.49	.67	.40
	NCF	.35	.96	.47	.34	.62	.36
	PSY/NCF	.41	.96	.56	.00	.73	.21

FBS (raw) Citation and cutting score	Group	Sensitivity	Specificity	HR	PPP	NPP	BR
(Lees-Haley, 1991)							
FBS > 24	PSY	.83	.67	.77	.67	.87	.40
(for men)	NCF	.77	.67	.47	.34	.62	.36
	PSY/NCF	.92	.67	.73	.42	.90	.21
(Lees-Haley, 1991)							
FBS > 26	PSY	1.00	.75	.67	.67	.70	.40
(for women)	NCF	.80	.75	.62	.48	.76	.36
	PSY/NCF	.75	.75	.84	.68	.87	.21

Note. BR = base rate, percentage of individuals in sample who were malingering; Sensitivity = percentage of individuals in group falling below cutting score; Specificity = percentage of individuals in honest group falling above cutting score; HR = hit rate, percentage of both groups correctly classified by cutting score; PPP = positive predictive power, percentage of those with positive test sign who were malingering; NPP = negative predictive power, percentage of those with negative test sign who were not malingering; PSY = Psychiatric Feigners; NCF = Neurocognitive Feigners; PSY/NCF = Psychiatric and Neurocognitive Feigners; MMPI-2 = Minnesota Multiphasic Personality Inventory-2; FBS = Lees-Haley Fake Bad Scale.

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VITA
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EDUCATION

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Major: Counseling Psychology.
Graduation Date: May 2000

Centre College. Danville, Kentucky
B. S.
Major: Psychology.
Graduation Date: May 1998

PROFESSIONAL EXPERIENCE

August 2000 -   University of Kentucky
Present   Department of Psychology

July 2003 -   Psychology Student Intern/Psychometrician
Present   Department of Neurology-UK

June 2003-   Instructor
August 2003   (PSY 312, Brain and Behavior)

August 2002-   Teaching Assistant
May 2003   (PSY 215, Experimental Psychology lab)

September 2002- Group leader, Dialectical Behavior Therapy group
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June 2002-   Instructor
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July 2001-   Psychology Student Affiliate, Eastern State Hospital
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June 2000- June 2002	Psychology Intern, Cardinal Hill Rehabilitation Hospital
August 2001- Present	Therapist, Jesse G. Harris Psychological Services Center
August 2000- May 2001	Teaching Assistant (PSY 215, Experimental Psychology)
August 2000- July2001	Psychometrician (C. Christopher Allen, Ph.D., PSC-private practice)
May 1999- May 2000	Research Assistant Department of Psychiatry-UK
July 1999- February 2000	Research Assistant Department of Behavioral Science and Internal Medicine-UK

SELECTED PAPERS AND PRESENTATIONS

Vickery, C.D., Berry, D.T.R., Dearth, C.M.S., Vagnini, V.L., Baser, R. E., Crager, D.E., & Orey, S.A. (2002). Head Injury and the Ability to Feign Neuropsychological Deficits. Archives of Clinical Neuropsychology, 599, 1-12.

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Vagnini, T. L., & Thompson, J. (1998, March). Mood shifts during the menstrual cycle. Poster presented at the meeting of the Southeastern Psychological Association, Alabama.

Vagnini, T. L., & Thompson, J. (1997, November). Mood shifts during the menstrual cycle. Poster presented at the meeting of the Kentucky Academy of Science, Kentucky.