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Prevalence and Assessment of Malingering in Homicide Defendants Using the Mini-Mental State Examination and the Rey 15-Item Memory Test

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Abstract

This study surveyed malingering prevalence in pretrial homicide defendants and assessed the usefulness of the Mini-Mental State Examination (MMSE) and the Rey 15-Item Memory Test (FIT) in detecting malingering among them. Malingering prevalence was 17%. MMSE and FIT scores were positively correlated. The MMSE and FIT had modest positive predictive value (67% and 43%), but reasonably good negative predictive value (93% and 89%), for malingering. Overall, the MMSE outperformed the FIT, with no advantage to combined use of the MMSE and FIT over the MMSE. The widely used MMSE, traditionally a bedside test of cognition, may have a role in malingering assessment.

Keywords

mental illness; correlates; investigation; policing; medical resources; structural causes; felony; subtypes; victimization; death penalty; courts

Introduction

Homicide defendants are generally referred for forensic evaluation because of mental health concerns raised by their attorney or the court. Concerns might include behavior or communication suggesting mental illness, limited intellect, use of illicit or licit substances at the time of the crime, atypical findings at the crime scene, and/or claimed amnesia for the murder. Psychiatric illness, history of traumatic brain injury, cognitive impairment, and neurological abnormalities are common findings in homicide perpetrators (Denney & Sullivan, 2008; Frierson & Finkenbine, 2004). Even so, due to the serious nature of murder charges, the possibility of malingering must also be routinely considered (defined by the

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DSM-IV-TR as the intentional production of false or grossly exaggerated physical or psychological symptoms, motivated by external incentives such as … avoiding criminal prosecution; American Psychiatric Association, 2000, p. 739).

Malingering is fairly common in medicolegal evaluations and prevalence estimates range from 5% to 45% depending on the setting and population (Coons, 1991; Gothard, Viglione, Meloy, & Sherman, 1995; Leavitt & Sweet, 1986; Rogers, 2008). There is a growing literature concerning the detection of feigned cognitive deficits and mental illness in criminal forensic settings (Denney, 2007; Denney & Sullivan, 2008). Among individuals accused of homicide, 10% to 70% of them claim partial or total amnesia for the event (Bourget & Whitehurst, 2007; Grøndahl, Vaerøy, & Dahl, 2009; Rüsseler, Brett, Klaue, Sailer, & Münte, 2008; Woodworth et al. 2009).

Evaluators regularly supplement the clinical interview with psychometric testing in assessing for the presence of malingering (Hall & Hall, 2011; Lally, 2003). As has been noted by Larrabee (2008) and Lynch (2004), the more data obtained from multiple sources that suggests malingering, the greater the probability that actual attempts to deceive are occurring and that an evaluee who is malingering will be correctly identified. Although the exact base rate of malingering is difficult to determine, Mittenberg, Patton, Canyock, and Condit (2002), in their review of psychological testing data from 1,341 criminal court cases, reported that 19% of defendants had scores on neuropsychological measures that were suggestive of malingering and/or symptom exaggeration.

Mini-Mental State Examination (MMSE)

The Mini-Mental State Examination (MMSE) is a commonly used cognitive screening instrument in clinical (nonforensic) evaluations. It has a maximum score of 30 points and briefly assesses orientation, attention, calculation ability, memory, naming, repetition, comprehension, reading, writing, and visuospatial proficiency (Folstein, Folstein, & McHugh, 1975). The traditional cutoff scores for cognitive impairment have ranged from 24 to 27, with 24 being the commonly cited cutoff (e.g., a score of < 23 suggestive of clinical impairment), and norms vary according to age and education. In recent years, some researchers have argued that higher cutoff scores may be necessary to screen for milder, earlier forms of neurocognitive disease (O'Bryant et al., 2008).

There is minimal research examining the usefulness of the MMSE in detecting malingering or otherwise addressing medicolegal issues in forensic populations (Billick, Perez, & Garakani, 2009). In addition, we are unaware of any studies specifically examining the applicability of the MMSE in homicide offenders. However, several studies exist with some relevance to forensic assessment. Powell (1991) found that mental health facility workers instructed to feign mental illness were more likely than patients with schizophrenia to provide approximate answers on the MMSE. In a study comparing participants faking various mental disorders, those with genuine mental illness, and controls using the Rey 15-Item Memory Test (FIT), the FIT results were found to highly correlate with MMSE and IQ scores (Schretlen, Brandt, Krafft, & Van Gorp, 1991). Gierok, Dickson, and Cole (2005), while primarily describing results for the Test of Memory Malingering (the TOMM is an oft-used measure to detect malingering), noted a mean MMSE score of 23.8 and estimated IQ of

74 for their sample of 20 pretrial males placed in a facility for the assessment of competency to stand trial. (It was not stated whether any of these forensic detainees were homicide defendants.) Both MMSE and TOMM scores were significantly lower in those patients with pending legal charges compared to the 20 members of the psychiatric control group, and the authors opined this was consistent with them having exerted less effort on testing than those with no obvious secondary gain. Curiously, the authors did not remark on the fact that the psychiatric control group had a markedly higher mean IQ than the forensic group, a confound that raises concern about the validity of their findings.

Rey 15-Item Test of Memory (FIT)

The FIT was first introduced in 1964 by Andre Rey (Rey, 1964; Sharland & Gfeller, 2007; Slick, Tan, Strauss, & Hultsch, 2004; see Table 1 for a list of terms used to describe the FIT). The FIT is conducted by asking an individual to look at a sheet of 15 symbols arranged in three columns and five rows, each containing three related items. The evaluee is given 10 seconds to memorize the symbols and is then asked to replicate the contents. Prior to being shown the symbols, the individual is informed that they will be asked to remember them. On the surface this task sounds difficult but, in reality, due to the similarity of the groupings and redundancy of the rows, is a relatively easy task for a neurotypical individual to perform (Martin, 2002; Russeler et al., 2008). The FIT assumes an individual has intact spatial memory, short and immediate term memory, and basic working memory (e.g. the ability to learn, store, retrieve, and apply information; Leng & Parkin, 1995; Martin 2002; Wortzel & Arciniegas, 2008). Immediate memory is a memory function usually preserved even in persons with amnestic disorders caused by brain damage (Leng & Parkin, 1995). Neurologically impaired individuals who have difficulty on the FIT may have evidence of parahippocampal or hippocampal injuries since this is a key part of the brain involved in spatial memory (Wortzel & Arciniegas, 2008).

Surveys of neuropsychologists have found that 57% to 79% use at least one test designed specifically to assess for malingering when conducting an evaluation, with the two most commonly used tests for this purpose being the TOMM and the FIT (Sharland & Gfeller, 2007; Slick et al., 2004). In the survey by Slick et al. (2004), one third of neuropsychologists reported that they “often” or “always” use the FIT when doing an evaluation, while about another one third indicated that they do use the test, but “rarely.” Although the FIT has a low sensitivity (Reznek, 2005), it is frequently used because it is simple, inexpensive, and easy to score.

Although the original work by Rey did not validate set cutoff scores, the general consensus in the published literature is that correct response scores below 9 (or less commonly 8) are suggestive of malingering and/or suboptimal effort (Reznek, 2005). This type of malingering detection tool is often referred to as a “test of effort” or, more appropriately, an “intention to deceive test” (Frederick & Bowden, 2009; Hall & Hall, 2011). Some populations, even with good effort, may score suboptimally on the FIT. These include individuals with low IQs or advanced dementia (Dean, Victor, Boone, Philpott, & Hess, 2008; Hayes, Hale, & Gouvier, 1997; Hurley,K.E., Deal, W.P. 2006; Reznek, 2005; Schretlen et al., 1991). Most of these populations, nevertheless, including even those individuals with psychiatric disorders such

as schizophrenia, perform above the recommended cutoff scores (Hays, Emmons, & Lawson, 1993; Schretlen et al., 1991).

Goldburg and Miller (1986) conducted the first normative study of the FIT on 50 psychiatric inpatients and 16 mentally retarded individuals (mean IQ 63.4), and identified a cutoff score of 9 as suggestive of malingering (that is, scores below 9 are consistent with malingering). Of note, for the 16 individuals with mental retardation, the mean score was 9.9 with a standard deviation of 3, indicating that it is possible for individuals with mental retardation and no perceived reason to malinger to fall below the cutoff score of 9. The mean score for the psychiatric patients was 13.5 with a standard deviation of 1.8. None of the psychiatric inpatients in this study scored below 9. Likewise, Reznek's (2005) meta-analysis suggested that the FIT should not be used with individuals suffering from significant mental retardation. Of studies in this meta-analysis using a FIT cutoff score of 9, specificity was 85% and sensitivity 36%, whereas in those using a FIT cutoff score of 8, specificity was improved to 92% but sensitivity dropped to 9%. Additionally, when studies were excluded that incorporated individuals with mental retardation, a cutoff score of 9 gave a specificity of 90% and a cutoff score of 8 raised specificity to 95%.

Studies of the FIT among individuals with neurological deficits (e.g., due to epilepsy or brain injury) suggest a similar or slightly lower cutoff score is appropriate. In one study, medical inpatients suffering from temporal lobe epilepsy (with demonstrated memory difficulty on at least one neurological assessment) were compared with nonlitigating outpatients referred for neuropsychological assessment, and it was determined that a cutoff score of 9 was too high for patients with neurological disorders (Lee, Loring, & Martin, 1992). Instead, they recommended a cutoff score of 8, which resulted in a specificity of 96% in a population with a known neurological disorder. In reevaluating these data, Martin (2002) found a nine-item cutoff had a specificity of 93% for both the temporal lobe patients and the nonlitigating group. The sensitivity of the litigating group remained unchanged at 32.5% using the slightly higher cutoff score and thus it was concluded that since there was only a minor improvement in the specificity with the lower cutoff score, the traditional cutoff value of 9 was still appropriate for suggesting malingering in this population. Other studies as well of the FIT in individuals with head trauma suggest cutoff scores between 8 (Bernard & Fowler, 1990) and 9 (Taylor, Kreutzer, & West, 2003) are reasonable, and they highlight that the FIT, when applied to brain-injured populations, will commonly yield scores in a range similar to psychiatric controls.

Only one peer-reviewed, published study has assessed the use of the FIT in pretrial homicide defendants. Simon (1994) examined 14 pretrial individuals suspected of malingering compared to 14 individuals found not guilty by reason of insanity, and it was found that a cutoff score of 9 was appropriate. Using this cutoff, 12 out of 14 malingerers ($M = 4.57$, $SD = 2.95$) were correctly identified and only two out of 14 controls ($M = 10.07$, $SD = 3.56$) would have been misidentified. Simon opined that the FIT was particularly helpful in evaluating a forensic population that appeared to be unsophisticated in their presentation.

Initially, Simon (1994) was going to limit the malingering group to individuals who had IQs above 70, but due to most participants in the malingering group appearing to "perform well

below their true ability" on the IQ test given as part of the evaluation, the elimination criteria became "no previous diagnosis of mental retardation." The clinical presentation of the malingerers was judged to be extreme in terms of the thrusting forth of symptoms and unusual presentations, as evident from nine of the malingerers receiving an IQ score of less than 40. This may become more of a point of contention in current cases given the *Atkins v. Virginia* (2002) Supreme Court ruling, which prohibits the death penalty if the convicted individual has mental retardation.

The Current Study

The purpose of this study was twofold. First, we wanted to survey the rate of malingering in a sample of pretrial homicide defendants. Second, we were interested in assessing the utility of the MMSE and FIT in detecting malingering in this population. It was hypothesized that the MMSE and FIT scores would be lower in the malingerers and that FIT and MMSE scores would be positively correlated. Of note, the term *malinger*, as used in the study, is not meant as a pejorative or otherwise judgmental term. Rather, from a decision theory standpoint, malingering by defendants facing serious criminal charges can be viewed as an adaptive response to challenging circumstances (Rogers, 2008). The type of malingering being accessed was broad in the sense that the tests were given to all evaluees regardless of their clinical presentations being suggestive of a specific type of malingering (e.g., psychologic symptoms, cognitive ability).

Method

Participants

This retrospective study investigated 35 pretrial homicide offenders referred for forensic psychiatric evaluation. Their mean age was 31.9 years (SD = 14.5, range 14–68 years); 77% were male; 40% were White, 46% Black, 11% Hispanic, and 3% Asian. Average level of education was 10 years (SD = 2.0). Full-scale IQ ranged from 58 to 128. The sample was divided into four IQ categories: 20% (n = 7) fell in the high average IQ range (> 115), 51% (n = 18) in the average IQ range (85–115), 14% (n = 5) in the low average IQ range (75–85), and 14% (n = 5) in the below average to mental retardation range (< 74).

As expected, psychopathology was common in this sample, and all but one offender (97%) met criteria for a *DSM-IV-TR* Axis I or II disorder. The most common diagnoses were substance use disorders (34%), followed by any personality disorder (29%), antisocial personality disorder (26%), PTSD (14%), schizophrenia/schizoaffective disorder (14%), any affective disorder (14%), learning/language disorder (9%), mental retardation (6%), dementia/cognitive disorder (6%), anxiety disorder (3%), pervasive developmental disorder (3%), sexual sadism (3%), and conduct disorder (3%).

Case Information

All of the subjects were seen by the first author during forensic psychiatric consultation in multiple states over a 10-year period to address one of the following: mental state at the time of the offense (69%), competency to proceed (20%), competency to waive *Miranda* rights (6%), sentencing factors (17%), or some combination of these (20%; thus the total

percentage is greater than 100%). Twenty-one cases (60%) were referred by the prosecution (state attorney or attorney general) and 14 (40%) were referred by the defense (public defender or private counsel). Ninety-one percent were incarcerated at the time of evaluation. Homicides were empirically divided into five general categories based on the predominant phenotype: Argument/Conflict (49%), Domestic (20%), Felony (9%), Psychotic (11%), and Sexual Homicide (11%). In 31 cases there was a single victim, and in four cases there were multiple victims (mean of 2.75 victims; range 2–4).

Procedure

Each case was evaluated using a standard forensic psychiatry approach. After the defendant was informed about the purpose of the evaluation and limits to confidentiality, a comprehensive psychiatric interview was conducted. All testing was administered following the interview portion of the examination. The MMSE was administered first, followed by the FIT, and then any other tests as clinically indicated (e.g., intellectual, personality, or other psychopathology measures). In most cases, a forensic psychiatry fellow or psychiatric resident was also present. However, no examinations were conducted with a detention facility officer in the examination room or within hearing range.

Determination of whether an evaluee was malingering or not was based on a review of all collateral case data, clinical interview findings, and supplementary testing results (excluding the MMSE and FIT). Additional testing measures were administered as needed based on the clinical presentation of the individual, and some examples of instruments used included the *Structured Interview of Reported Symptoms*, the *Miller Forensic Assessment of Symptoms Test*, the *Test of Memory Malingering*, the *Validity Indicator Profile*, the *Minnesota Multiphasic Personality Inventory-2*, and the *Personality Assessment Inventory*. Of note, amnesia for all or part of the homicidal behavior was not considered a form of malingering in this study. Amnesia is a common claim among homicide defendants (e.g., “I blacked out,” “I must have snapped”), and its presence is difficult to verify or negate. While in some instances it may be reflective of deception, it was nonetheless found to be a symptom that could not be confidently judged in this population.

Data Analysis

Data for the current analyses were compiled from forensic chart review. The Lifespan Institutional Review Board approved the protocol. Frequencies and distributions of all numeric variables were examined for any issues of nonnormality. Given the limited sample size and resulting nonnormal distributions, nonparametric statistics (i.e., the Fisher exact test and Mann-Whitney U test) were conducted to (a) examine mean differences between malingerers and nonmalingerers on demographics, IQ category, diagnosis of ASPD, MMSE scores, and FIT scores, and (b) identify the sensitivity and specificity of the MMSE and the FIT in identifying malingerers using clinically relevant cutoff scores for each measure (MMSE scores of 24 and above and FIT scores of 9 and above, as guided by the literature and manuals). The Fisher exact test is used when sample size in insufficient (e.g., N is less than 5 in a particular cell) to conduct chi-square tests for independent samples. The Mann Whitney U test is a commonly used nonparametric statistic used when the assumptions for

an independent *t* test are not met (Pett, 1997); this test is based on group comparisons of summed rank scores.

Results

Seventeen percent ($n = 6$) of defendants were determined to be malingering. Of these 6, 2 feigned psychological symptoms (e.g., delusions, hallucinations), 2 feigned cognitive symptoms (e.g., memory impairment), and 2 feigned both. Bivariate comparisons of malingerers versus nonmalingerers ($n = 29$) indicated no group differences in age, education, biological sex, race and ethnicity, IQ category, or the presence of ASPD (all p values > .05). The average MMSE score was 27 + 4.15 (range 14–30) and the average FIT score was 12 + 3.43 (range 3–15). Rey and MMSE scores were positively and strongly correlated ($r = .74$, $p < .0001$).

There was a trend for malingerers and nonmalingerers to differ on average MMSE scores (mean scores of 22.5 vs. 27.3 respectively; $z = -3.53$, $p = .08$). Not unexpectedly, defendants with IQs in the low average to mental retardation range had significantly lower MMSE scores than defendants with IQs in the average to above average range of intellectual functioning (mean scores of 22.4 and 28.08 respectively; $z = -3.53$, $p < .0001$).

When MMSE scores were dichotomized into two groups using a cutoff score of 24 (MMSE-identified cognitive deficits [$n = 6$] versus no deficits [$n = 29$]), a greater proportion of malingerers had MMSE scores below 24 ($p = .004$). MMSE score positively identified 67% of malingerers (i.e., true positive rate of 67%), and only misidentified two defendants as malingerers who had not been classified as such vis-à-vis full evaluation (i.e., false positive rate of 7%). Of interest, one of the misclassified nonmalingerers, who had some college education and did not have cognitive deficits, was observed to be highly anxious throughout the examination, and this may have accounted for a MMSE score just below the cutoff of 24. The other misclassified nonmalingerer had moderate mental retardation.

Defendants did not differ with respect to average FIT scores (mean scores of 10.5 vs. 12.8 respectively; $z = -1.22$, $p = .22$). Only a trend was observed when FIT scores were dichotomized into malingerer ($n = 7$) versus nonmalingerer ($n = 28$) groups ($p = .08$). The FIT positively identified only 50% of malingerers (i.e., true positive rate of 50%), and misidentified four other defendants as malingerers who were not classified as malingerers vis-à-vis full evaluation (i.e., false positive rate of 14%). However, all of these four defendants had conditions that clinically may have contributed to their low FIT score. One defendant had residual psychotic symptoms and associated attentional impairment, one had moderate mental retardation, one had borderline intellectual functioning and learning disabilities, and one had dementia.

As described earlier, 4 of the 6 malingerers feigned cognitive symptoms. The MMSE correctly identified 3 (75%) and the FIT 2 (50%) of these 4 participants.

The Sensitivity, Specificity, Positive Predictive Value, and Negative Predictive Value for the MMSE and FIT are provided in Table 2. The MMSE ostensibly outperformed the FIT in each of these categories. A scatterplot visually depicts the results in Figure 1.

Discussion

The first purpose of this study was to survey the rate of malingering in a population of pretrial homicide defendants. The rate of malingering in this sample was 17%, similar to results from earlier studies of forensic populations. This is considered a conservative estimate of malingering in this sample, as claimed amnesia for the homicidal act was not weighed as a possible form of malingering. The diagnostic assessment of crime-related amnesia is a challenging endeavor, even controversial at times (e.g., as in dissociative amnesia), with important legal implications nonetheless; it is further complicated by there not being a generally accepted definition (Bourget & Whitehouse, 2007; Cima, Merckelbach, Nijman,. Knauer, & Hollnack, 2002). While we initially considered including feigned amnesia as malingering, it proved to be too difficult to define and verify with any degree of confidence. Some defendants reported just amnesia for the actual act (e.g., pulling the trigger). Others denied a memory of the entire murder and surrounding circumstances. Still others communicated varying degrees of memory for the homicidal event depending on the scenario (e.g., differing versions provided in interrogation, clinical, and forensic psychiatric evaluation settings). Additional variables added to the challenge of assessing the veracity of claimed amnesia, like intoxication at the time of the murder and its potential impact on memory, the effect of rapport with questioners and their skill level on degree of recollection, waxing and waning of mental illness symptoms, and legal case developments. Future studies of malingering in criminal settings should consider carefully operationalizing the diagnosis of malingered amnesia using strict criteria.

Our second study purpose was to assess the usefulness of the MMSE and FIT in detecting malingering in this population of pretrial homicide defendants. It was hypothesized that the MMSE and FIT scores would be significantly lower in the malingerers and that these scores would be positively correlated. As hypothesized, MMSE and FIT scores were strongly correlated. However, the usefulness of the MMSE and FIT in detecting malingering was limited. Scores on these measures only identified two thirds and one half of malingering cases, respectively. And consistent with previous literature on the use of the FIT in forensic populations, the FIT in the present study proved to be of more use in corroborating true negative cases than in identifying true positive cases; this was also true for the MMSE.

Surprisingly, the MMSE—a long-established bedside test of cognition and not a traditional test of malingering—appeared to have more clinical utility in detecting malingering than the FIT in this study. The MMSE independently detected two thirds of the malingering cases in this sample, a not insubstantial performance by this straightforward clinical measure, especially given the inherent difficulty in identifying malingering. Furthermore, and unexpectedly, there was no advantage to the combined use of the MMSE and FIT over the MMSE alone, an outcome at odds with the common assumption that more measures are better in the assessment of malingering (see the following paragraph). As shown in Table 2, the MMSE outperformed the FIT in all test characteristic categories, and the MMSE also outperformed or equaled the MMSE/FIT combination approach.

It is a common recommendation in the literature to conduct more than one test to improve malingering detection accuracy. In a review of effort-based tests in a traumatic brain injury

population, Lynch (2004) recommended that if malingering or poor effort is suspected, then at least two measures should be used to verify such concerns. In looking at symptom validity tests, Larrabee (2008) reported that the accuracy of malingering detection progressively increased with the use of multiple instruments, reaching 74% to 99% with failure on two symptom validity tests and 93% to 99% with failure on three symptom validity tests. The findings in our study, when just considering the MMSE and FIT results, are not in agreement with these above findings, as combining these two tests did not improve their accuracy over being used independently when categorizing the sample as malingering or not (with the exception of the MMSE/FIT sensitivity trending above the FIT sensitivity).

In general, there are four ways for an individual to malinger: (a) to fabricate symptoms outright; (b) to report ongoing symptoms that have resolved; (c) to exaggerate the severity of symptoms that exist; and (d) to attribute symptoms occurring for one reason to another cause (Hall & Hall, 2011). Malingering remains a difficult entity to diagnose, except in extreme cases. Many forensic scholars realize the difficulty of making a definitive statement about intent, and encourage evaluators to use cautious language in their reports, such as, “There are no objective findings to support the subjective reports,” “Results are invalid,” or “Results are inconsistent with the severity of the injury.” Unless the facts are clear and there is an egregious example of deception supported by multiple pieces of evidence (e.g., clinical examination, inconsistencies in records, observed behavior, psychometric testing), one should be cautious in applying the term “malingering,” and if one does, then it is important to carefully support this conclusion with the specific reasons for so believing (Slick et al., 2004). No one test or aspect of an evaluation can definitively diagnose malingering 100% of the time, short of the individual admitting to deceiving the evaluator in a credible way. The findings in this study highlight the importance of taking a judicious approach when evaluating a criminal defendant for the possibility of malingering. The FIT and MMSE are but two of various objectively scored tools, with inherent psychometric limitations like any other psychological testing measure, which may be of assistance to the examiner in conducting a comprehensive forensic evaluation.

The FIT has been criticized in the medical literature for having a low sensitivity in detecting malingering. That is, someone who is malingering may not be detected by the FIT (false negative). This has even led some to question if its use as a test of malingering is valid and if testimony based on its use has the ability to withstand a Daubert hearing (Vallabhajosula & van Gorp, 2001). As pointed out by Mossman (2003), those who downplay the usefulness of the FIT and its acceptability in legal settings may not be considering the basics of malingering detection theory. It can be argued that a greater value of the FIT in the criminal defendant evaluation process, and perhaps also the MMSE based on these preliminary research findings, is to assist in identifying malingering as a possibility rather than in excluding it (e.g., a FIT score of 3 is suggestive of malingering, whereas a score of 10 does not rule out the possibility).

A positive finding on the FIT or MMSE can prove useful when it is aligned with other evaluation information indicating a pattern consistent with malingering. Individuals suspected of malingering on the FIT also seem to intentionally perform poorly on other measures (i.e., IQ) given at the same time (Simon, 1994), underscoring the importance of

putting test outcomes into context. A relative strength of the FIT, and perhaps the MMSE also, is that they are more likely to underdiagnose than overdiagnose the probability of malingering although caution must be taken to not misinterpret a normal result as proof that no attempt to malinger is present, as the intent to do so may go undetected by these tests. Furthermore, malingering style will also affect the FIT and MMSE results. Those who malinger purely psychological symptoms, for instance, suicidality or hallucinations, will presumably be less likely to be identified by the MMSE or FIT than those who feign multiple types of symptoms or just cognitive symptoms.

A primary limitation of this study is the small sample size. Consequently, the extent of statistical analysis that could be performed was limited. However, given the dearth of literature in the area of malingering assessment in homicide defendants, empirical studies of this type can offer some guidance in the clinical and psychometric assessment of this population. And while the MMSE and FIT proved to have modest sensitivity for the detection of malingering in this pretrial population, they both demonstrated reasonably good specificity using cutoff scores of 24 and 9. Moreover, we found it intriguing and worthy of further investigation that these initial findings found the MMSE superior to the FIT in detecting malingering in murder defendants. Future studies with greater sample sizes are needed to increase our understanding of the practicality of these two tests in the assessment of criminal defendants.

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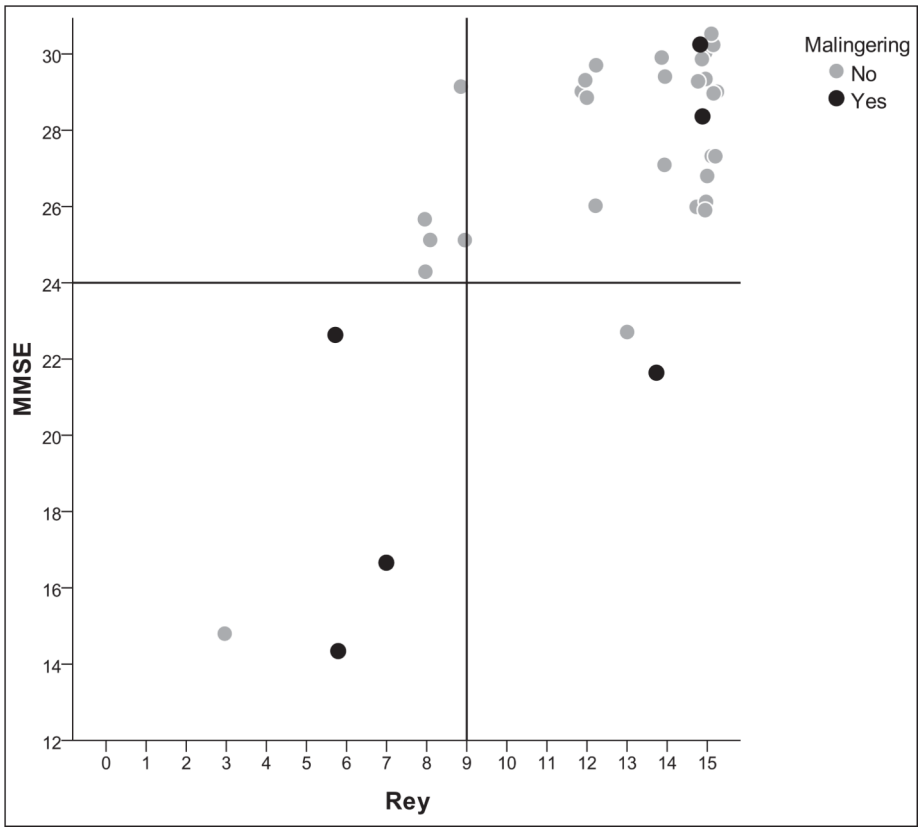

Figure 1.
Scatterplot of MMSE and FIT scores by malingering classification (N = 35).

Table 1.

Terms for Rey's Test for Malingering.

Identifying terms found in literature	Tests not to be confused with the FIT
Fifteen Items Test of Memory: FIT	Rey Auditory Verbal Learning Test: RAVLT
Memory of 15 Items Test: MFIT	Rey Visual Design Learning Test: RVDLT
Rey 15-Item Test of Memory: RFIT	Rey Complex Figure Test: aka Rey-Osterrieth Complex Figure
Rey Memory of Fifteen Items Test: RMT	Rey Dot Counting Test
Rey's 15-Item Visual Memory Test	Rey Word Recognition Test
Rey 15-Item Memorization Test	REY II - uses concepts of the FIT but has 16 items

Table 2.

Test Characteristics for the Sample ($N = 35$).

	MMSE ($N = 35$)	FIT ($N = 35$)	MMSE/FIT ($N = 35$)
Sensitivity	67%	50%	67%
Specificity	93%	86%	83%
Positive predictive value (PPV)	67%	43%	44%
Negative predictive value (NPV)	93%	89%	92%

Sensitivity: proportion of defendants with malingering who tested positive. Specificity: proportion of defendants without malingering who tested negative. PPV: proportion of defendants with positive tests who were malingering. NPV: proportion of defendants with negative tests who were not malingering.