

Simulation of Brain Damage: Assessment and Decision Rules

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The possibility of fabricated or exaggerated organic deficits is a frequent concern in both civil and criminal forensic cases. Additionally, organic deficits may exist, but be incorrectly attributed to a claimed cause. Exaggeration or fabrication can apply to primary cognitive or emotional effects of brain damage or to secondary emotional effects. These categories of deficits, and their relationship to physical brain damage, must be clearly understood in order to comprehensively evaluate the possibility of malingering. This includes evaluation of different forms of consistency between (1) behaviors during evaluation, (2) claimed deficits and known organic syndromes, (3) behavior or claims during evaluation and actual life-functioning, and (4) test performance and known principles of cognitive functioning. Psychometric procedures and clinical strategies are described which can substantially aid in assessing consistency and distinguishing between honest and exaggerated self-reports. Limitations of available assessment techniques are described and a general decision model for evaluation of dissimulation of organic deficits is presented.

The two characteristics which most critically distinguish forensic assessments from standard clinical practice are the tailoring of investigatory procedures to legal criteria and the primacy of the consideration of malingering or exaggeration. In both civil and criminal areas, the presentation of being disordered can be of legal benefit, as in exculpation for a criminal offense through the defense of insanity, or through the acquisition of monetary benefits in claims of personal injury or malpractice. This has led to increasing interest and research by forensic psychiatrists and psychologists^{1,2} and led to the development of various

guidelines for the evaluation of malingering.³⁻⁵

In this article we will review principles and procedures specifically related to the evaluation of fabrication or exaggeration of the effects of brain damage, with particular emphasis on the use of standardized neuropsychological instruments toward this end. We will also discuss related situations in which brain damage or psychological deficits may exist, but be falsely ascribed to a given cause—situations which are not infrequently encountered in civil injury cases.

Definitions

DSM-III-R⁶ defines malingering as the intentional production of false or grossly exaggerated physical or psychological symptoms, and lists medicolegal

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context of presentation as a major area in which malingering should be suspected. Resnick³ has further refined this general concept, and distinguished pure malingering (outright fabrication) from partial malingering (exaggeration of genuine deficits), and has added the category of false imputation, which is the ascribing of actual symptoms to a cause consciously recognized as having no relationship to those symptoms. An additional category which can also occur in civil injury cases, is that of false attribution, or the honest but erroneous ascription of deficits to a particular (and in this context, organic) cause.

Evaluation of Claims

We will use the personal injury case as a general model, because this involves issues of causality, which may not be paramount in other forensic situations, such as assessment of criminal and civil competencies and criminal responsibility. To prove a case involving claims of brain damage, a plaintiff must be able to demonstrate, first, presence of brain damage, second, presence of behavioral or emotional deficits ("damages" in the legal sense), third, a causal connection between those deficits and brain damage, and fourth, a causal connection between the brain damage and the claimed precipitant (e.g., head injury resulting from a motor vehicle accident) (7). The defense can successfully refute a claim by disproving any of these four requirements.

Evaluation of Deficits

Nature of Cognitive Deficits Types of deficits which can directly result from

brain damage fall into three general areas, all of which can be malingered, and which are not mutually exclusive. These are, first, primary cognitive effects, which include disorders of gnosis (perception), language, mnesis (memory), and praxis (movement).⁸ These are the primary areas toward which mental status examinations and neuropsychological procedures are designed to be sensitive.^{9,10} Second are direct emotional effects. These include the organic personality disorders, other disorders of impulse control, and effects of lateralized deficits on emotional functioning. Lateralized emotional effects range from the catastrophic reaction often seen in left-hemisphere dysfunction to an unconcern similar to "la belle indifference" seen with injuries to the right hemisphere.¹¹

Finally, there are the secondary emotional reactions to brain damage, which are not easily separable from emotional reactions to any trauma or loss,¹² and which easily encompass the victim's family as well as the individual.¹³ The related area of the "posttraumatic" or "postconcussion" syndrome remains highly controversial. Reviews of existing research in this area have ranged in their conclusions from believing this phenomenon to be primarily a malingered syndrome¹² to most likely constituting a valid organic syndrome.¹⁴ The most conservative strategy, therefore, would be to suspect malingering when a postconcussive or posttraumatic syndrome is claimed, but not to view such claims *per se* as evidence of malingering or exaggeration.

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Complicating this arrangement, however, are functional disorders which can interfere with performance on cognitive tests through effects on attention, concentration, and mental speed, and mental illnesses which may actually mimic organic disorders (e.g., pseudodementia and functional amnesia). Depression, in particular, has been shown to produce organic patterns of performance on neuropsychological testing, with improvement following successful treatment with antidepressant medication.¹⁵ Finally, some disorders currently designated as "functional," may in fact have a neurological basis. Any of these situations can complicate organic assessment, to be sure, but they also present fertile ground for the generation of false imputation or attribution.

Outcome Categories and Decision Rules In the area of organic assessment, a fundamental difference must be made between the concepts of "brain damage" and "deficit." Brain damage or organic involvement refers to any deviation of brain structure or function from expected, premorbid, or optimal levels. Deficit, by contrast, refers to the actual impairment, loss, or aberration of intellectual, emotional, behavioral, or cognitive (intentional and executive) functions. "Damage," therefore, refers to the physical functioning of the central nervous system, whereas "deficit" refers to behavior. One means of exploring ways in which possible malingering or exaggeration may play a role in legal claims is to describe the following possible outcome-states in a forensic evaluation:

1. No Brain Damage Present and No

Deficits Present This is, of course, the best situation for the defense (e.g., in civil tort cases). It is the simplest situation and probably the rarest. Both conceptually and empirically, it is harder to prove "normalcy" than to demonstrate deficit or deviation. Such a situation may be most effectively demonstrated psychometrically, through comparison of psychometric test findings to available norms for non-brain damaged populations. It may be more easily and convincingly demonstrated, for example, that a claimant's memory scores are one or two standard deviations above the expected mean for age and education, than to simply state that no evidence can be found to justify claims of memory disturbance.

2. Brain Damage Present, Deficits Absent It would not be absurd to propose that this may be true for most of us! To this extent, it constitutes a trivial case. Anomalies or difficulties in pre, para, and postnatal development, injuries and illnesses throughout one's lifetime, drug use—both prescribed and otherwise—exposure to toxic agents in the environment and workplace, and general anomalies of brain structure, can in any combination lead to "organic" laboratory findings, yet have no substantial effect on actual intellectual or emotional functioning. Continuing advances in magnetic resonance imaging (MRI) procedures, for example, are uncovering "UBOs" (Unidentified Brain Objects, i.e., anomalous images which have no known etiology or behavioral effects) with increasing frequency in otherwise normal individuals. Presence of "dam-

ages." in the legal sense of actual, tangible, losses in one's abilities, however, is the primary and necessary legal criterion for redress, compensation, or exculpation; and it is this which must be demonstrated in order to establish the validity of a claim.

3. Brain Damage Absent, Deficits Present Here the possibilities include presence of organic involvement which is not within the sensitivity of laboratory techniques,^{12,16} malingering or exaggeration of organic deficits, or false ascription of nonorganically related problems to an injury, illness, medication, or other physical cause. The misattribution of deficits in test performance to brain damage, when any of these other factors may account for it, is particularly common in reports by neuropsychologists who do not have forensic expertise and tend to accept claimant's self-reports concerning the reasons for and history of deficits. The Standards for Educational and Psychological Testing of the American Psychological Association¹⁷ specifically require that all alternative possible reasons be assessed and ruled out before deficient performance on a given test can be conclusively attributed to a particular deficit or disorder in the individual (Standard 6.11).

4. Brain Damage Present, Deficits Present This is, of course, the best situation for plaintiff's case, but is not sufficient to prove the case. The following questions, in order, then need to be addressed: Are the deficits genuine? Are they related to the organic impairment? Is the organic involvement due to the claimed cause? Such questions cannot

be answered by neurological, extended mental status, or neuropsychological assessment alone, but absolutely require comprehensive review of the claimant's history.

Assessment of Malingering: Basic Considerations

Regardless of whether an evaluation is primarily neurological, neuropsychiatric, or psychometric, the hallmark criterion for the evaluation of malingering is the presence of inconsistency: Is performance on assessment or formal testing consistent or inconsistent with claimed deficits? Are observed deficits consistent or inconsistent with nonassessment behavior? Are performance deficits consistent or inconsistent with each other? Finally, how consistent are the reported or demonstrated deficits with the claimed cause?

In complex cases, consistency with claimed cause can be the most difficult issue either to confirm or refute. Some organic syndromes or disorders, such as closed head injury, have well-researched and specific patterns of deficits and progression over time.¹⁸ The patient or plaintiff, however, may have a complex medical history, with prior problems complicating evaluation of expected patterns. Also, many forms of claimed organic injuries, such as effects of toxic environments, multiple drug effects, or effects of nonpsychiatric medications, have not been well researched as to specific resultant patterns of behavioral or neuropsychological deficits.¹⁹⁻²¹ Finally, one must be able to differentiate between inconsistent findings and atypical

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cases—a distinction which may be neither theoretically nor empirically easy.

Consistency of performance with itself, by contrast, can be comprehensively evaluated. For example, if deficits in learning ability and recent memory are claimed, deficits should occur across tasks involving these abilities. Relatedly, performance on more difficult tasks should never be better than on easier tasks or on tasks which require subsidiary abilities included within the more difficult ones. Psychometric procedures are particularly well-suited to evaluate this form of consistency,¹⁴ in that such instruments as the Wechsler Adult Intelligence Scale-Revised²² or the Luria-Nebraska Neuropsychological Battery²³ are composed of hierarchies of items whose relative difficulty has been empirically established. Therefore, any inconsistent patterns of success and failure on items of these instruments as a function of difficulty can be clearly documented.²⁴ Prior research on malingering of intellectual deficits has consistently shown that subjects simulating mental deficiency have shown significantly more inconsistency in their success or failure as a function of item difficulty than honest responders.²⁵ This finding, however, is more pronounced when items are not administered in a standard order of increasing difficulty, but rather, presented in more random order.

Evaluation of the consistency of claimed deficits with non-test behavior is highly dependent upon the comprehensiveness with which adequacy of functioning in everyday life can be assessed and documented.²⁶ Such infor-

mation can be gathered through interviews with others, postinjury work, academic, or other performance records,²⁷ covert observation²⁸ or behavioral observations during assessment. Heaton and Heaton,²⁹ for example, describe surreptitiously measuring the time taken for a patient to walk down a hallway upon entering the clinic, then comparing this with the time taken when the patient is formally asked to walk the same distance and knows that he or she is being timed. In regard to performance records, we have had several cases of our own in which comprehensive review of pre- and postinjury academic records have clearly refuted claims of cognitive deficits resulting in impairment of academic abilities.

These general principles, involving the key concept of consistency, are also basic to the use of psychometric procedures. Psychological tests offer no unique principles in regard to the assessment of malingering, but rather, offer standardized, objective, and empirically verifiable procedures for the evaluation of the categories of consistency, as just described.

Nature of Neuropsychological Testing

In the assessment of the presence and effects of brain damage, laboratory techniques such as EEG, rCBF (regional cerebral blood flow), spinal taps, CT scans, and MRI are often used to provide "hard" evidence of organic involvement. They are, however, limited in their accuracy for any given patient or type of brain damage.^{12, 15} In the case of trauma,

all of these techniques are limited and may show results within normal limits despite behavioral indications of brain injury. MRI, however, does appear superior to CT scans in detecting evidence of "shearing" injuries which are believed to underlie deficits encountered in milder cases of closed head injury.^{30,31} In addition, the results of radiological techniques must be interpreted, and they are thus not as objective as often thought.²⁴ Laboratory techniques are most important in cases where they do find a deficit, but none of these techniques can establish the degree of actual impairment of functioning that a given injury may create.

In neurological and neuropsychological assessments, both the presence and effects of brain injury can be established by assessing the behavioral consequences of an injury and inferring the physiological deficit by the pattern of performance. These types of evaluations directly measure the behavioral consequences of organic impairment on an individual, and are therefore crucial in determining such issues as damages in the legal sense and particular types of competency.

The emphasis of the neuropsychologist is on the collection of data in a standardized format using objective measures of performance within specific areas. The advantage of objective tests is derived from research which allows for an empirical correlation of specific test results with specific behavioral and neurophysiological indices.³² This diminishes subjectivity in the testing process and, more importantly, allows others to

evaluate the reasonableness of one's techniques and conclusions without having to rely solely on the reputation of the examining clinician. Subjective factors still remain as a part of such procedures; and standard clinical evaluation, medical and psychiatric history, and laboratory findings are all necessary in any comprehensive evaluation of claimed organic dysfunction.

Psychometric Assessment of Malingering

1. General Fabrication and Exaggeration of Psychiatric Symptoms

Because effects of organic impairment can include emotional or other psychiatric symptoms, and these are often claimed, tests sensitive to such general malingering need to be included in any forensic psychometric assessment. Of available psychometric instruments, the MMPI has the most well-validated scales for the evaluation of exaggeration and minimization of psychopathology.^{33,34} This instrument contains a variety of different scales which assess response-bias on the basis of different strategies, and which have been validated in a variety of experimental and clinical subject samples.⁸ These are based on strategies of assessing frequency of rare or unusual symptoms (F-scale), endorsement of symptoms commonly but erroneously believed to indicate psychiatric disorder (Gough Dissimulation Scale³⁵), and relative endorsement of subtle versus obvious symptoms of psychopathology.³⁶ These scales have been recently found to successfully differentiate subjects ex-

pected to mangle from those not expected to do so in criminal forensic evaluations.² Heaton et al.³⁷ found that the only psychometric score significantly differentiating neuropsychologically malingered from genuine organic protocols was the only one of the MMPI validity scales sensitive to malingering (F-scale) that they included in their study. Other personality inventories, such as the Millon Clinical Multi-axial Inventory and the Sixteen Personality Factors Questionnaire also include validity scales, but none have been as well validated as those of the MMPI.³² Attempts to differentiate emotional reactions due to organic versus functional etiology have generally not been successful,³⁸ although a recent review indicates that patients suffering nonorganic depression show consistent, significantly higher MMPI Depression scale scores than brain-damaged subjects across studies.³⁹

2. Neuropsychological Malingering

Although reports have been published of successful identification of subjects instructed to mangle on specific neuropsychological tests,⁴⁰ these have not been replicated; and without replication, these approaches should not be used to make potentially damaging and pejorative conclusions about an individual. Use of test data alone has the additional shortcoming that nonorganic disorders can produce organic-appearing test protocols.^{14,41} A reasonable assumption used in the assessment of malingering is that "naive" subjects should not be knowledgeable as to the patterns of deficits expected from particular organic disorders, and therefore, should show

discrepant test performance.²⁶ This assumption has not been confirmed in studies assessing the ability of neuropsychologists to assess malingering on the basis of quantitative neuropsychological test scores,^{37,42} and performance discrepant from known brain injury or disease would not rule out atypical but genuine organic impairment. More revealing is inconsistency between tests or individual tasks requiring the same capacities. The Luria-Nebraska Neuropsychological Battery is particularly suited for evaluating this possibility in that items are hierarchically arranged such that later, more complex items require combinations of capacities tapped by earlier, simpler items within scales. As previously mentioned, impairment on later, but not earlier, items would be inconsistent with organic deficit.²⁴

Certain tests have been proposed specifically for the detection of neuropsychological malingering.²⁷ One such test, the Rey Dissimulation Test (Fig. 1), appears particularly promising^{14,43} and has received recent, partial validation.⁴⁴ This test requires memorization of a card with 15 symbols for 10 seconds, after which the examinee is asked to reproduce as much as can be remembered. The symbols, however, are organized into only three concepts (number, letter, and shape) and only these three need to be remembered in order to regenerate the 15 individual items. The test, therefore, appears more difficult than it is, and even most mildly mentally retarded patients can reproduce nine items. Also, in honest errors, categories (entire lines of the card) are omitted, while malingering-

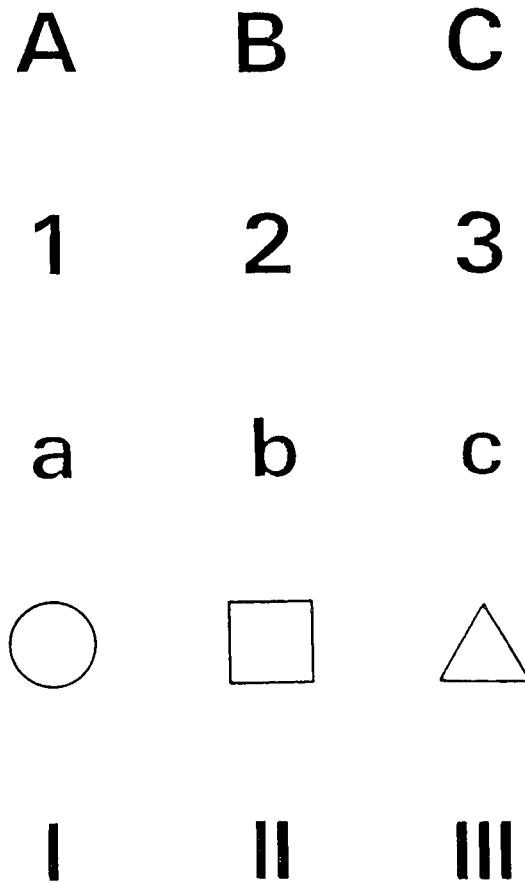


Figure 1. Rey Dissimulation Test.

ing can be suspected if individual items which cut across categories are omitted.

Lezak²⁷ also describes a dot-counting task (Figs. 2 a and b) which maximally assesses a patient's consistency on a simple but prolonged task. Six cards are presented, one at a time, with different numbers of dots on them. The examinee is simply asked to count the dots. The cards are not presented in order of difficulty (number of dots). Later, six more cards are presented, this time with the dots organized in patterns. With or without memory impairment, subjects should take longer to count more dots

and should count organized dots more quickly than unorganized dots. If either of these patterns of performance is not obtained, malingering may be suspected. Lezak²⁷ also presents percentile norms for this test. Both the Rey test and dot-counting task are based on the principle that some tasks appear much more difficult than they actually are, even for organically impaired individuals, and malingering would be indicated by poor performance in all but the most severely organically impaired individuals. Such strategies can have considerable utility, when combined with more traditional and accepted procedures, and can be validly used as screening procedures. That is, good performance can serve as a basis for ruling out conscious malingering, while poor performance should be evaluated further and be considered in the total weight of evidence favoring or contraindicating malingering.

3. *Assessment of "Memory" vs. Amnesia* Perhaps the most commonly claimed cognitive deficit encountered in forensic evaluations is one involving memory. The Rey Dissimulation Test, mentioned above, is a type of memory test and may be particularly useful in cases where such claims are made. Another potentially useful procedure involves a comparison of self-reported memory problems to those reported by significant others. Sutherland *et al.*,²⁶ for example, have shown that patients with severe memory deficits tend to claim less frequent problems than are observed by others, and the authors provide a useful checklist for comparing reports of the patient to that of others. Their checklist

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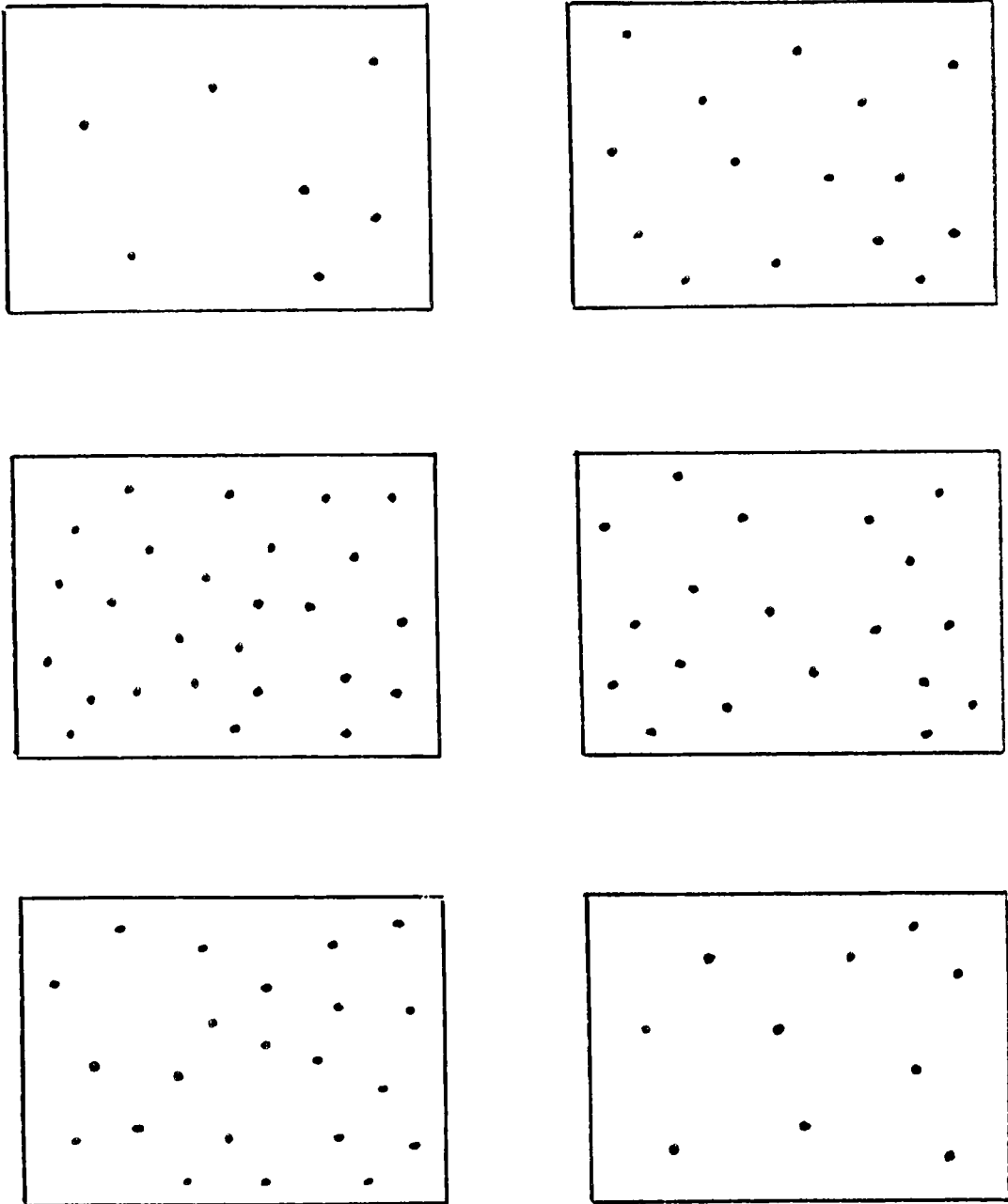
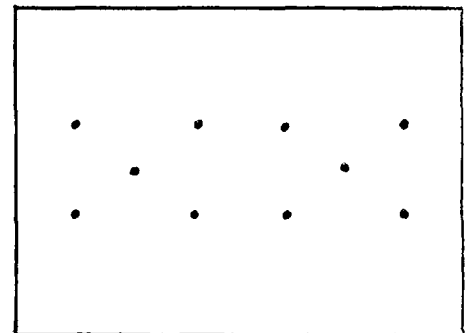
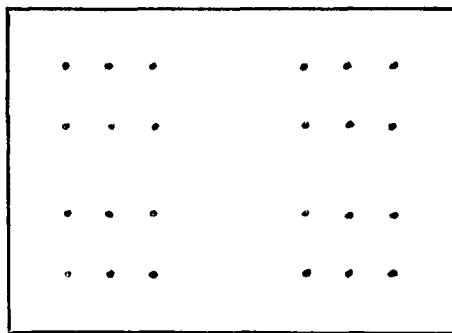
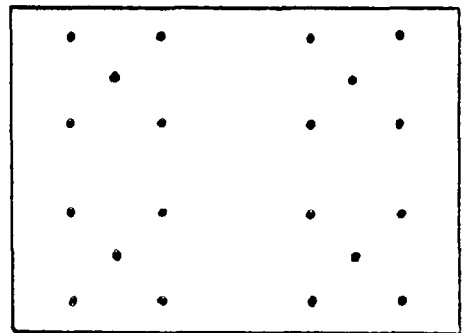
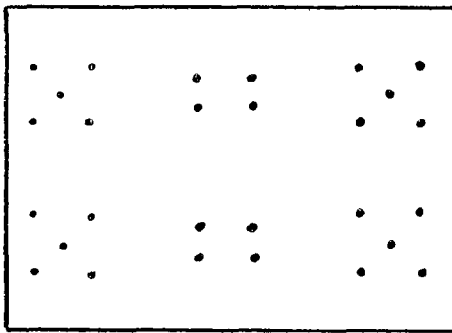
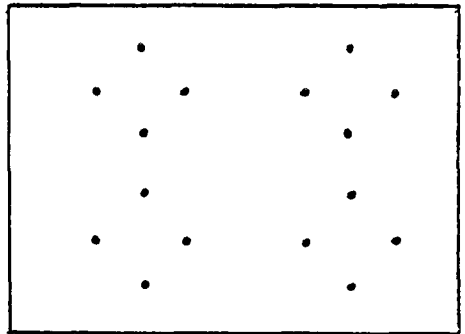
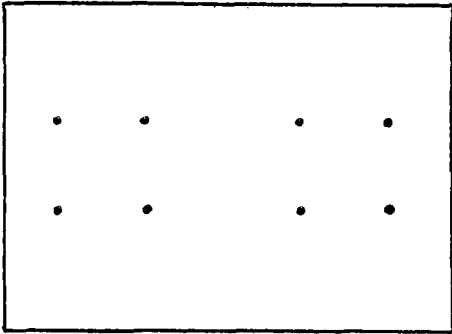


Figure 2. A, Dot Counting Test, unorganized format.



B, Dot Counting Test, organized format.

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has the additional advantage of including rare symptoms, which are unlikely in any but the most severe or unusual syndromes (e.g., prosopagnosia, long-term and procedural memory complaints).

A crucial distinction needs to be emphasized between memory evaluation and assessment of amnesia. All psychometric memory tests are really measures of new learning (acquisition and recall of acquired information). Genuine amnesia may be present, however, without any deficits in new learning capacity (short-term or recent memory), and therefore without presence of deficits on formal testing. These two categories of memory disturbance need to be clearly distinguished, and problems in one area may not necessarily have relevance to problems in the other. In the evaluation of amnesia for prior, personal information, many beliefs and procedures have arisen in clinical lore;⁴⁵ but these have not stood up well under the scrutiny of experimental method.^{34,46} For this reason, proposed "checklists" for discriminating functional, organic, and feigned amnesia for past events should be viewed cautiously.

4. *Minimization* Finally, minimization should not be discounted in forensic organic assessment. Although individuals with genuine organic deficits cannot be expected to fake adequate performance, a variety of organic conditions can result in unawareness of deficits and thus result in underreporting of difficulties.^{8,24} The MMPI can be particularly important in exploring this possibility; and personality testing can be very use-

ful in any comprehensive assessment, for purposes of evaluating response bias in either direction (exaggeration or minimization), emotional effects of possible brain damage, and functional disorder as an alternative explanation for claimed deficits.^{27,40}

Limitations of Psychometric Procedures

Research into the relationship between brain function and behavior has advanced so rapidly in the recent past that testing practices based on invalidated neuropsychological assumptions are still often encountered. For example, no existing single test or battery can cover all possible effects of different types of brain damage. Additionally, certain types of brain damage can cause severely debilitating changes in behavior or emotional functioning, with little, if any, effect on measurable cognitive functions.¹¹ No tests or formulae claimed to be able to assess premorbid levels of intelligence or other cognitive abilities have been sufficiently validated or replicated for generation of conclusive statements concerning premorbid cognitive functioning.⁴⁷ Any such estimation requires access to specific historical data. Also, no personality test (e.g., MMPI, Rorschach) has been shown to adequately discriminate organic from functional psychopathology.^{38,39} Conclusions based on any of these practices are unwarranted and should be challenged through more adequate evaluations and the legal safeguard of the cross-examination.

The following should be considered as inappropriate or inadequate neuropsychy-

chological testing practices.^{27,34} (1) “blind” testing and interpretation (i.e., using a stock procedure regardless of the specifics or without review of prior history and evaluations); (2) lack of personality and psychopathology evaluation; (3) “gut” impressions of diagnosis or issues of malingering without clear objective or observational data; (4) conclusions as to organicity or malingering based on single tests, intelligence testing alone, or performance on personality tests; (5) conclusions that loss or reduction in functioning has occurred without historical assessment of prior functioning; (6) prognostic conclusions based on testing performed prior to maximum recovery; (7) conclusions as to degree of recovery based on the examinee’s self-description alone; and (8) conclusions that deficits were due to a specific historical incident, based on test data alone.

Summary and Conclusions

This article has focused primarily on the evaluation of the validity of cognitive deficits. The comprehensive evaluation of possible brain damage and its effects is a complex enterprise which requires all of the clinical skills necessary in psychiatric assessment, plus specific knowledge of brain function, organic syndromes, brain-behavior relationships, and special assessment techniques. Assessment of an individual at any one point in time can rarely present a sufficient picture of symptom validity or extent of legal damages. Neither radiological, neurological, nor neuropsychological techniques can do more than provide the examiner with a “snapshot” of the

present, nor fully delineate the effects of dysfunction on an individual’s actual functioning in life. A detailed history, plus access to information other than the patient’s or claimant’s self-report, is always mandatory, no matter how clear the patient’s presentation may appear. Also, whenever brain damage is suspected, effects on other family members should always be evaluated, because emotional effects on others can be at least as severe as those suffered by the victim of brain damage.^{13,24} Finally, it is unfortunate but all too common that rehabilitative efforts are either minimally or poorly used, sometimes because of a fear that they may affect one’s legal case. Ethically, the clinician should always be sensitive to and report any recommendations for treatment, regardless of whether or not the purely cognitive complaints in a particular case are valid.

The label of “malingerer” is one of the most pejorative of designations which can be applied to a claimant or defendant. For this reason, it should be used carefully and conservatively. Malingering, as conscious distortion, covers not only the invention of psychopathology or cognitive deficits, but also extends to the exaggeration of genuinely existing symptoms. In such cases, it may be difficult if not impossible to clearly assess the extent of genuine dysfunction; yet such deficits do exist and may be compensable or may be relevant to legal competencies. Alternatively, genuine symptoms may exist but be consciously or unconsciously attributed to a particular claimed event. Brain damage may exist,

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but not necessarily account for claimed deficits; and in civil (e.g., personal injury) cases, "damages" in the legal sense must be proven to have resulted from the brain damage, and the brain damage, in turn, must be shown to have resulted from the claimed event.

Malingering of deficits from brain damage can include fabrication or exaggeration of cognitive deficits, primary (organic) emotional or personality dysfunction, or secondary emotional reactions to the presence of organic deficits. Each of these possible areas of distortion, therefore, needs to be assessed in any comprehensive forensic evaluation. Psychometric assessment of both functional and organic complaints can be helpful in the assessment of malingering, and several procedures, including their strengths and limitations, have been described. Causality, however, cannot be assessed by any psychometric or clinical procedure in itself, and absolutely requires a thorough history in order to establish a clear before-and-after picture of the individual. Additionally, claims of amnesia for past events may not be amenable to assessment through testing of present memory functioning, as the two types of memory dysfunction processes are different and need not occur concurrently. Finally, lack of awareness of dysfunction is common in organic disorders. Therefore, minimization, denial, or lack of awareness should also always be assessed when the possibility of organic involvement exists.

The behavioral neurosciences constitute a fascinating, complex, and rapidly expanding area of scientific exploration;

and the clinician should maintain an ongoing knowledge of current empirical research in this field. Additionally, the assessment of malingering and dissimulation remains an underresearched area in which unproven beliefs and procedures are unfortunately still all too common.

References

1. Cavanaugh JL, Rogers R (eds): Malingering and deception. *Beh Sci Law* 2: 1984
2. Wasylw OE, Grossman L, Cavanaugh JL, *et al.*: Detection of malingering in a criminal forensic group: MMPI malingering scales. *J Pers Assess* 56:578-82, 1988
3. Resnick P: The detection of malingered mental illness. *Beh Sci Law* 2:21-38, 1984
4. Rogers R: Toward an empirical model of malingering deception. *Beh Sci Law* 2:93-111, 1984
5. Rogers R: *Clinical Assessment of Malingering and Deception*. New York, Guilford, 1988
6. *Diagnostic and Statistical Manual of the American Psychiatric Association, Third Edition-Revised*. Washington DC, 1987
7. Prosser WL: *Handbook of Law and Torts*. St. Paul MN, West, 1971
8. Luria AR: *The Working Brain*. New York, Basic Books, 1973
9. Strub R, Black F: *The Mental Status Examination in Neurology*. Philadelphia, F.A. Davis, 1977
10. Walsh KW: *Neuropsychology: A Clinical Approach*. New York, Churchill Livingstone, 1978
11. Blumer D, Benson D: Personality changes in frontal and temporal lobe lesions, in *Psychiatric Aspects of Neurological Disease*. Edited by Benson D, Blumer D. New York, Grune and Stratton, 1979
12. Wells CE, Duncan GW: *Neurology for Psychiatrists*. Philadelphia, FA Davis 1980
13. Lezak M: Living with the characterologically altered brain-injured patient. *J Clin Psychiatry* 39:592-8, 1978
14. Pankratz L: Malingering on intellectual and neuropsychological measures, in *Clinical Assessment of Malingering and Deception*. Edited by Rogers R. New York, Guilford, 1988
15. Sweet JJ: Confounding effects of depression on neuropsychological testing. *Int J Clin Neuropsychology* 5:103-9, 1983
16. Spreen O, Benton A: Comparative studies of

- some psychological tests for cerebral damage. *J Nerve Ment Disorders* 140:323-33, 1965
17. Standards for Educational and Psychological Testing. Washington DC, American Psychological Association, 1985.
 18. Levin HS, Benton AL, Grossman RG: Neurobehavioral Consequences of Closed Head Injury. New York, Oxford University Press 1982
 19. Hartman DE: Neuropsychological Toxicology: New York, Pergamon, 1988
 20. Heaton RK, Crowley TJ: Effects of psychiatric disorders and their somatic treatments on neuropsychological test results, in *Handbook of Clinical Neuropsychology*. Edited by Filskov SB, Boll TJ. New York, Wiley 1981
 21. Tedeschi CG, Echert WG, Tedeschi LG (eds): *Forensic Medicine: A Study in Trauma and Environmental Hazards*. Vol. III: Environmental Hazards. Philadelphia, WB Saunders, 1977
 22. Wechsler D: *Wechsler Adult Intelligence Scale-Revised Manual*. New York, The Psychological Corporation, 1981
 23. Golden CJ, Hammeke TA, Purich AD, *et al.*: *A Manual for the Administration and Interpretation of the Luria-Nebraska Neuropsychological Battery*. Los Angeles, Western Psychological Services, 1984
 24. Wasyliw OE, Golden CJ: Neuropsychological evaluation in the assessment of personal injury. *Beh Sci Law* 3:149-64, 1985
 25. Schretlen DJ: The use of psychological tests to identify malingering symptoms of mental disorder. *Clin Psychol Rev* 8:451-76, 1988
 26. Sutherland A, Harris JE, Gleave J: Memory failure in everyday life following severe head injury. *J Clin Neuropsychology* 6:127-42, 1984
 27. Lezak M: *Neuropsychological Assessment* (2nd ed). New York, Oxford University Press, 1983
 28. Miller H, Cartlidge N: Simulation and malingering after injuries to the brain and spinal cord. *Lancet* 1:580-5, 1972
 29. Heaton SK, Heaton RK: Testing the impaired patient, in *Handbook of Clinical Neuropsychology*. Edited by Filskov SB, Boll TJ. New York, Wiley, 1981
 30. Ramsey RG, Scheer-Williams M: Neuro-radiological evaluation of craniocerebral trauma. *Beh Sci Law* 5:239-86, 1987
 31. Zimmerman RA *et al.*: Head injury: Early results of comparing CT and high-field MR. *Am J Neuroradiology* 7:757-64, 1986
 32. Golden CJ, Strider MA: *Forensic Neuropsychology*. New York, Plenum Press, 1985
 33. Greene R: Assessment of malingering and defensiveness by objective personality measures, in *Clinical Assessment of Malingering and Deception*. Edited by Rogers R. New York, Guilford, 1988
 34. Ziskin J, Faust D: *Coping with Psychiatric and Psychological Testimony* (4th ed, Vol II: Special Topics). Beverly Hills CA, Law and Psychology Press, 1988
 35. Gough HG: Some common misconceptions about neuroticism. *J Consult Psychol* 18:287-92, 1954
 36. Weiner DN: Subtle and obvious keys for the MMPI. *J Consult Psychol* 12:164-70, 1948
 37. Heaton SK, Smith HH, Lehman RAW, *et al.*: Prospects for faking believable deficits on neurological testing. *J Consult Clin Psychol* 46:892-900, 1978
 38. Mack JL: The MMPI and neurological dysfunction, in *MMPI: Clinical and Research Trends*. Edited by Newmark CS. New York, Praeger 1980
 39. Farr SP, Martin P: Neuropsychological dysfunction, in *The MMPI: Use with specific populations*. Edited by Greene RL. New York, Grune and Stratton, 1988
 40. Benton AL, Spreen O: Visual memory test: the simulation of mental incompetence. *Arch Gen Psychiatry* 4:79-83, 1961
 41. Heaton SK, Baade L, Johnson K: Neuropsychological test results associated with psychiatric disorders in adults. *Psychol Bull* 85:141-63, 1978
 42. Faust D, Hart K, Guilmette TJ: Pediatric malingering: the capacity of children to fake believable deficits on neuropsychological testing. *J Consult Clin Psychol* 56:578-83, 1988
 43. Blau T: *The Psychologist as Expert Witness*. New York, Wiley, 1984
 44. Goldberg JO, Miller HR: Performance of psychiatric inpatients and intellectually deficient individuals on a task that assesses the validity of memory complaints. *J Clin Psychol* 42:792-5, 1984
 45. Pratt RTC: Psychogenic loss of memory, in *Amnesia: Clinical, Psychological and Medico-legal Aspects*. Edited by Whitney CWM, Zangwill OL. London, Butterworths, 1977
 46. Schacter DL: Amnesia and crime: How much do we really know? *Am Psychologist* 41:286-95, 1986
 47. Kleges RC, Troster AI: A review of premorbid indices of intellectual and neuropsychological functioning: What have we learned in the last five years? *Int J Clin Neuropsychology* 9:1-11, 1987
 48. Ziskin J: Malingering of psychological disorders. *Beh Sci Law* 2:39-49, 1984