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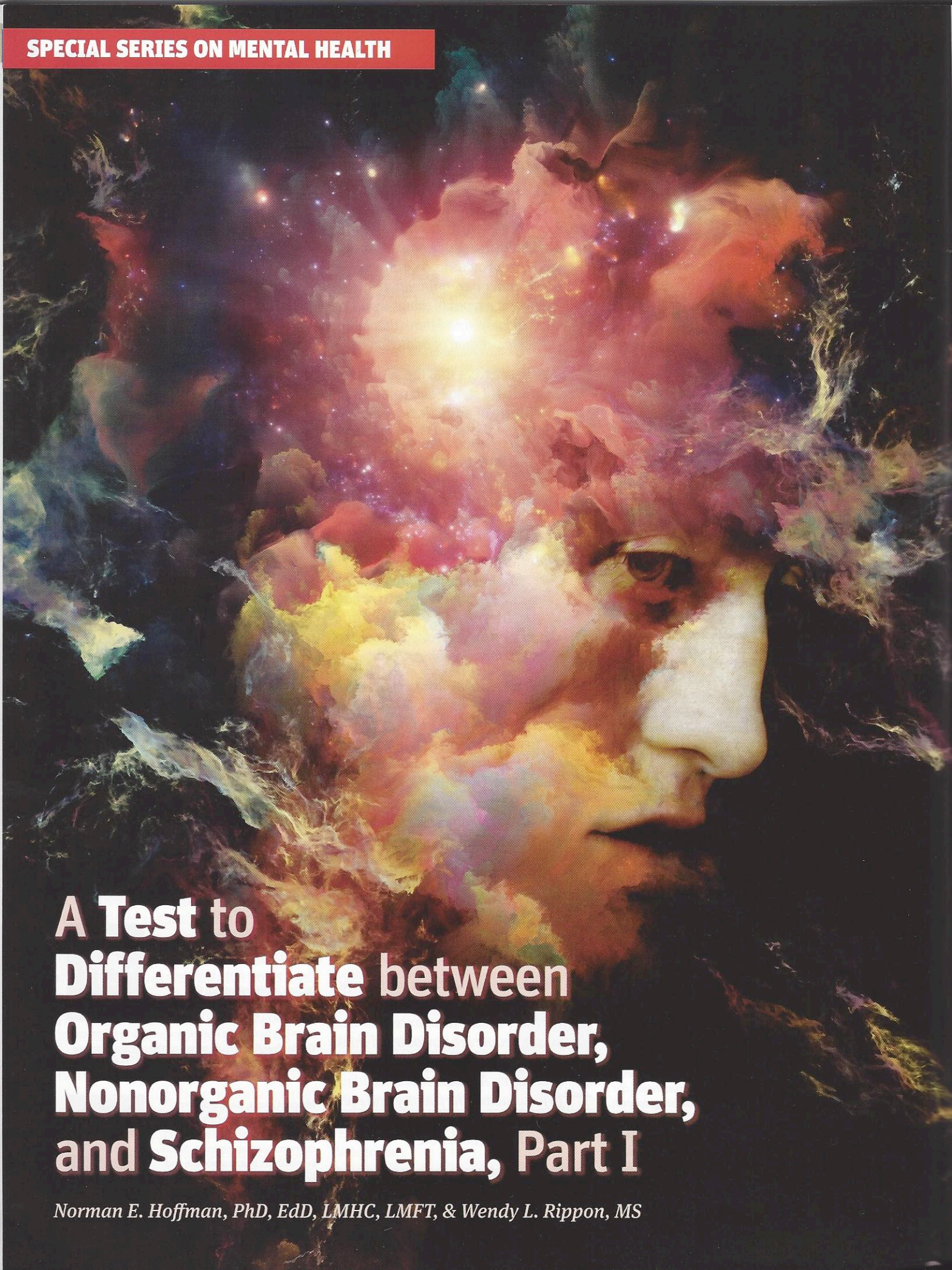

A Test to Differentiate between Organic Brain Disorder, Nonorganic Brain Disorder, and Schizophrenia, Part I

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The treatments for schizophrenia and/or organic brain disorders may be totally different; therefore, it is important that a method of differentiating between the two be utilized (Chapman, 1976; Klein & Davis, 1969). Historically, it has been difficult to distinguish between the symptoms of organic brain disorder and schizophrenia (Lezak, 1976). Diagnosing without proper treatment is insufficient. Therefore, many individuals inflicted with an organic brain disorder should have a specialized treatment program (Klein & Davis, 1969).

A vast number of patients displaying the symptomatic behavior of what would normally be diagnosed as schizophrenia are in reality exhibiting manifestations of an illness whose roots are organic in nature (Hoffman, 1974). It is often difficult to determine whether the individual truly is psychotic or suffering from some organicity with psychotic overlays (Lezak, 1976). There is much concern regarding the mislabeling of patients and treating them with inappropriate treatment methods (Menninger, 1959). The psychotic behavior may be the result of an expressive dysfunction; these disturbances are known as "apraxias." The apraxias typically involve impairment of voluntary action despite adequate motor innervation of capable muscles (Lezak, 1976). According to Lezak, "Identifying those psychotic conditions that have an organic component is often more difficult than distinguishing neurotic conditions or character disorders from symptoms of brain damage because some functional psychoses are as likely to disrupt attention, concentration, and mental tracking as are some organic conditions" (1976, p. 168).

Statement of the Problem

What occurs when individuals cannot perceive rhythm or do not have the capacity to perceive, remember or associate rhythmic patterns? What transpires when there is an impairment in any of the many various bodily rhythmic functions such as speech, vision, walking, and others? Whenever any one of these bodily rhythmic functions is impaired, there is a resulting disability in daily lifestyle to some degree (Hoffman, 1974). The purpose of the Hoffman Organicity Test (HOT) is as follows:

- To determine whether or not such brain damage does exist in patients previously diagnosed as psychotic
- To provide psychiatrists, psychologists, and others, with an easily administered and valid test assessment to differentiate between organics and nonorganics
- To provide a valid diagnostic procedure so that proper treatment can be facilitated for those found to be suffering from cerebral damage

Diagnosis for organic brain disorder is commonly based on psychological, neurological or neuropsychological tests and behavioral observations in addition to conventional neuro-organic examinations (Freedman & Kaplan, 1972; Lezak, 1976). Many of the standard tests for organic brain disorders are time consuming and are cost prohibitive (Lezak, 1976).

Some research has suggested the utility of a shortened form of a screening device to differentiate organics versus other groups (Horton, Anilane, & Berg, 1988). Shortened tests for organicity may be as effective in differentiating organic from psychiatric patients. Also, there may be clinical utility in those settings where time constraints preclude the administration of a full length battery and there is a need to identify patients with organic dysfunction. A shortened form has a primary purpose to act as a screening device to assist in determining the need for a more complete assessment of functioning. Tests which are comprehensive in scope, validity, and reliability, such as the Halstead-Reitan Neuropsychological Battery (Reitan, 1993) or the Standardized Luria Neuropsychological Battery (Luria, 1993) require several hours for administration and special training in administration, scoring, and interpretation. Consequently they are not suitable to many clinical situations such as brief initial and emergency patient evaluations. There remains a need for brief, efficient procedures for screening of this neuropsychiatric patient population to determine if there may be clinically significant brain dysfunction, which warrants referral for evaluation with a complete standardized neuropsychological battery by a specialist.

The short attention span of organically impaired individuals makes lengthy testing procedures difficult for them (Lezak, 1976). Additionally, many psychometrists tend to refrain from purchasing costly testing material resulting in purchasing shorter, but unfortunately less accurate tests. This study will attempt to provide the mental health professional with a short, inexpensive, easily administered, and valid screening tool to differentiate between organic and nonorganic clients.

Hypotheses

1. H10: There will be no significant difference between the nonorganic group and the organic group score upon administration of the HOT.
2. H20: There will be no significant difference between the nonorganic group and the organic group score upon administration of the Bender Visual Motor Gestalt test.
3. H30: There will be no significant correlation between the HOT and the Bender Visual Motor Gestalt test upon being administered to the nonorganic group.
4. H40: There will be no significant correlation between the HOT and the Bender Visual Motor Gestalt test upon being administered to the organic group.
5. H50: There will be no significant difference between the

HOT scores with the nonorganic group scores upon being retested in two weeks.

6. H6o: There will be no significant difference between the HOT scores with the organic group scores upon being retested in two weeks.

Limitations of the Study

The results of this study are limited by the small, nonrandomized sample of the organic and nonorganic groups. This study is a pilot project and not intended to represent a larger population. The test was designed for English-speaking individuals only. Subjects were eliminated if they were taking medication and this was a precaution against results being contaminated due to medication side effects. No subject was chosen for this test who had hearing disabilities. Each subject was screened for hearing and perception of rhythmic patterns by the practice screening rhythmic patterns that were administered prior to the test.

Definitions

The following definitions represent uncommon terminology which need clarification for a more comprehensive understanding of this study.

Musicality/Musicalness

Musicality or musicalness is best defined, for the purpose of this study, as an ability or capability to perform or create music. The Hoffman Organicity Test does not depend on the subject's musical ability, skill or creativity, and a subject's musicalness does not influence the results of the test. The expectation of the subject is to remember and pair a rhythmic pattern to the appropriate geometric design and not to reproduce the rhythm.

Organicity

Organicity is a term used in this text representing a constellation of psychological/behavioral signs and symptoms as well as those with a known etiology. Organicity is used to describe any organic brain disorder regardless of diagnoses. It is of significant importance however, that the organic subjects in this study were those in which the etiology or pathophysiological process is unknown. In other words, there were no known organic factors that could be found to determine the cause of these diseases. Diagnoses of the subjects in this study included: primary degenerative dementia, multi-infarct dementia, and Alzheimer's disease, also referred to as senile and presenile dementias.

HOT

HOT stands for the Hoffman Organicity Test. The HOT is the revised Hoffman Test for Organicity (HTO). This test requires the subject to pair rhythmic patterns with geometric designs. It is a shortened and less cumbersome, bulky, and noisy version of the HTO. The HOT is a five-minute test to determine the presence of organic brain disorder. The HOT may be useful in diagnosing between an organic brain disorder and the nonorganic.

HTO

HTO stands for the Hoffman Test for Organicity (Hoffman, 1975). The HTO was a ten-minute test to determine the presence of organic brain disorder and the predecessor of the HOT. Test materials consisted of rhythmic apparatus—drum, cymbal, woodblock, and cowbell—for the subject to discriminate rhythmic patterns with their appropriate instrument.

Hit Rate

The hit rate pertains to the diagnostic accuracy of the study being described. For example, if the diagnostic accuracy for single neuropsychological tests in the comparison of normal and organic was 71 percent, the hit rate would be 71 percent.

Review of the Literature

Brain dysfunction, which does not necessarily imply structural change, is not a homogeneous entity, but rather represents a wide diversity of conditions (Mezzich & Moses Jr., 1980). However, screening for its presence is usually required before more probing and differentiating studies can be recommended and undertaken. There are a vast number of neuropsychological instruments that are purported to have a high predictability rate. However, attempts to predict organic cerebral impairment rarely produce a hit rate above 75 percent (Mezzich & Moses Jr., 1980).

Short Portable Mental Status Questionnaire

Results from Chapman's study (1987) compared the Short Portable Mental Status Questionnaire (SPMSQ) with the Bender-Gestalt Test (BGT) in screening for organicity among psychiatric patients. The data for this study were obtained from forty-three psychiatric patients. The organic group consisted of twenty-five subjects who were diagnosed as having some organic involvement in their psychiatric disorder. The nonorganic group consisted of eighteen subjects who had no organic involvement. The main findings demonstrate that the total accuracy or hit rate of the BGT in this study was 97.7 percent. The total accuracy or hit rate of the SPMSQ in this study was 67.4 percent. The SPMSQ was also found to produce very high numbers of false negatives. Because significance could not be attained in the comparison of SPMSQ scores and BGT scores, and because there was a large differential in accuracy rates and numbers of false negatives of the two procedures, the SPMSQ could not be recommended for screening for organicity.

Luria Nebraska Neuropsychological Battery

The Luria Nebraska Neuropsychological Battery (LNNB) is another useful tool for assessing organic brain disorder. It takes between 1.5 to 2.5 hours to administer and is designed for individuals fifteen years of age and older (Luria, 1993). The LNNB, as developed by Golden, Hammeke, and Purisch (1978), has led to a wide variety of research (Horton & Wedding, 1984), and is currently being used in a number of different settings. Research is ongoing in the development of a short form of the battery for screening purposes (Horton et al., 1988).

The LNNB is available in two equivalent forms: form I (269 items) and form II (279 items). Although they yield similar information, form II features improved stimulus cards that are much easier to use. Form II is spiral bound rather than loose and arranged in the proper sequence. Form II also contains one additional scale, Intermediate Memory, which permits more detailed memory assessment. Form I costs $425 and form II costs $390 (Luria, 1993).

Snow (1992), in his review of the LLNB, indicated that limited information is provided concerning test development and standardization. Standardization samples were extremely small for both forms I and II. The manual lists basic demographic information for the subjects (i.e., age, education, and sex), but no other information is provided.

The authors of the test provide the following statistics regarding the reliability of the measure (Snow, 1992, p. 485):

- Interrater comparisons indicated agreement of 95 percent in regard to scoring by different pairs of examiners.
- Split-half coefficients for the various scales range from a low of .89 to a high of .95.
- The manual also reports internal consistency coefficients for various diagnostic groups. These groups included normal, brain injured, schizophrenic, and mixed psychiatric subjects.
- Internal consistency estimates were high for the clinical groups, with resulting coefficients well within .80 range .
- Finally, test-retest coefficients are also reported in the manual. Utilizing a sample of twenty-seven neurological and psychiatric patients, these coefficients ranged from a low of .77 to high of .96.

Validity studies "suggest the battery to be fairly effective at discriminating brain-damaged patients from other clinical groups" (Snow, 1992, p. 485). One strength, reported by Snow (1992), was in the establishment of specific reliability coefficients with the various scales. Those reported are well within the acceptable range for a screening instrument and for use as a diagnostic tool.

Elizur Test of Psycho-Organicity

The Elizur Test of Psycho-Organicity purports to differentiate organics from nonorganics (Elizur, 1993). It takes about ten minutes and costs about $50. It uses the visual modality (e.g., drawing, digits, and blocks) and is designed for ages six years and older. Elizur found cutting scores suggested by the data for each subtest and identified better than 80 percent of both organics and nonorganics (Lezak, 1976). Lezak indicated that since Elizurs' subtests, point system, and cutting scores have not been evaluated by cross-validational studies, the usefulness of the scoring system and the cutting scores for diagnostic purposes remains highly questionable (1976).

There are a vast number of neuropsychological instruments that are purported to have a high predictability rate. However, attempts to predict organic cerebral impairment rarely produce a hit rate above 75 percent (Mezzich & Moses Jr., 1980).

Halstead-Reitan Neuropsychological Test Battery

The most expansive and expensive test is the Halstead-Reitan Neuropsychological Test Battery (Reitan, 1993). It is designed for ages five through adult. This test takes approximately six to eight hours to administer and costs $3,000.95. Although "effectiveness in correctly identifying organic patients, distinguishing them from neurologically intact control subjects . . . prediction rates are less likely to be high when the discriminations to be made are between organic and psychiatric patients" (Lezak, 1976, p. 442). The BGT alone had a higher predictions rate than any of the Halstead tests (Lacks, Harrow, Colbert, & Levine, 1970).

Short Category Test

This test is reported to be a diagnostic indicator of organic brain disorder measuring individuals' abilities to solve problems requiring observation, development of organizing principles, and responsiveness to feedback (Hartman, 1992). This test is designed for ages fifteen and over and costs $105 for the complete kit. It is estimated to take fifteen to thirty minutes to complete. The Short Category Test (SCT) is a revision of the longer Halstead-Reitan Category Test. It transforms Halstead's nine subtests containing 360 items into five subtests of twenty items each. The manual reports a reliability coefficient of .81. The manual notes, however, that the reliability coefficient must be interpreted with some caution because the items are linked together within subtests resulting in some artifacts (Hartman, 1992).

Hartman (1992) indicated that test-retest reliability coefficients were not reported for the SCT. Results of a study comparing the Category test of the Halstead-Reitan Test Battery and the SCT indicate that the two tests are highly related (.93 and .80). It appears that the two tests are measuring similar abilities. Analyses between the error scores of the "brain-damaged and non-brain-damaged" subjects indicated a high degree of predictability. Eighty-three percent of the total group was correctly classified (Hartman, 1992).

Bender-Gestalt Test

The most popular of the neuropsychological assessment tools is the Bender-Gestalt Test (BGT). This test takes approximately ten minutes and is relatively accurate in determining organic involvement. The cost is about $70 (Bender, 2003).

The BGT consists of nine figures, mostly familiar geometric designs, which were presented one at a time to the individuals under study. The procedure requires subjects to copy these figures as accurately as possible on a blank sheet of paper. The test is inexpensive, nonverbal, and standardized. This test entails little risk or discomfort and is nonthreatening to the subjects being tested. Oberleder (1967) recommends the BGT as the best single test for identifying mental deterioration in this group since it requires minimal amounts of communication and cooperation.

Bender-Gestalt Geometric Designs

Brilliant and Gynther (1963) gave the BGT to 109 neuropsychiatric inpatients who were diagnosed as organic or nonorganic. Each subject was

also administered the Benton Visual Retention and the Graham-Kendall Memory for Designs Tests. All tests were scored without knowledge of the patients' diagnoses. According to Lacks, "For correct diagnoses of all subjects, Bender-Gestalt Test, with a diagnostic accuracy of 82 percent, seems to be the best single measure" (1984, p. 57).

The Benton Visual Retention Test error score was the least adequate with 66 percent of the total number of cases correctly diagnosed. The Graham-Kendall Memory for Designs Test had a diagnostic accuracy of 78 percent.

Test Comparison of Bender-Gestalt with other Neuropsychological Tests

There have been a few attempts to demonstrate the diagnostic accuracy of the BGT in comparison with other neuropsychological tests by using more than one test with the same group of patients. Brilliant and Gynther (1963) compared the hit rate of the BGT to the Benton Visual Retention Test and the Graham-Kendall Memory for Designs Tests. Findings suggested that the BGT had an overall diagnostic hit rate of 82 percent in comparison to 81 percent for the Benton and 78 percent for the Graham-Kendall. When using the same tests with different patients, the BGT demonstrate a significantly higher diagnostic accuracy (Lacks, 1984).

Korman and Blumberg (1963) compared the BGT with the Trail Making, Memory for Designs, and Spiral Aftereffect tests. The overall diagnostic accuracy of the BGT was 74 percent compared with 90 percent for uncorrected Memory for Designs, 83 percent for Memory for Designs corrected for age and education, 83 percent for Spiral Aftereffect, and 70 to 83 percent for various combinations of scores on Trail Making.

Lacks et al. (1970) compared the hit rate of the BGT to the five subtests of the Halstead-Reitan battery of tests. Results suggested that the Halstead-Reitan score correctly diagnosed 84 percent of the organic patients (versus 74 percent for the BGT) and 62 percent of the nonorganic patients (versus 91 percent for the BGT). Satz, Fennell, and Reilly (1970) compared the predictive validity of five neurological tests that had been given over a period of four years to patients referred to a university neuropsychology service. Between sixty-seven and 404 patients were administered each test. Patients were classified as brain injured or suffering functional disturbance by the senior medical staff using a wide variety of measures. Overall hit rates for the five tests were 78 percent for the EEG, 61 percent for skull X-ray, 57 percent for brain scan, 69 percent for arteriogram, and 76 percent for pneumoencephalogram. In general, these results were lower than those found by Spreen and Benton (1965). Overall, the simple, inexpensive BGT compares quite favorably with neurological tests for accuracy in ruling in or ruling out organic brain disorders (Malec, 1978).

In summary, there is appears to be little proof to justify giving more than one test to screen for organicity. The BGT demonstrated that it compared favorably to those found in a review of ninety-four studies of neuropsychological test results with psychiatric patients (Lacks, 1984). The conclusion was that clinicians could feel confident to use these tests except where chronic or process schizophrenics are concerned (Heaton, Baade, & Johnson, 1978). Heaton et al. (1979) found that schizophrenics may show signs of organic impairment making most tests fail to diagnose accurately for organicity.

Diagnostic Utility

Most neuropsychological testing instruments test for a variety of deficits, including lateralization and localization of focal brain impairments, fine motor coordination, visual motor perceptions, memory, organization, and others. In spite of the cost, length, and content of the tests, they report about the same validity in determining the presence of organicity.

The HOT was designed to test for visual motor perceptions, recent memory recall, and associative integration of pairing of rhythms to the appropriate geometric designs.

In the pursuit of producing a comparative study with the HOT, it seemed imperative that the test is quantifiable and has a strong measure of reliability. Another important factor was the need for the instrument to have a scoring system that was valid. The validity of any test refers to the degree to which it measures what it purports to measure (Heaton et al., 1978).

Single Neuropsychological Test Versus Neuropsychological Test Batteries

Many researchers (Bigler & Ehrfurth, 1981; Parsons & Prigatano, 1978; Walsh, 1978) appear perplexed by the continued interest of clinical psychologists in single neuropsychological tests, such as the BGT, when much more extensive and sophisticated batteries of tests like the Halstead-Reitan are available. These critics believe the use of a single test to determine the presence of organic brain disorder oversimplifies the diagnoses of organicity. These critics suggest that the unitary concept of organicity is naive and simplistic, and those who subscribe to it have little recognition of the complexity of neuropathology (Davidson, 1974). The critics believe that specific damage will lead to specific deficits requiring a wide range of different tests tapping a variety of functions to make an accurate diagnosis. It has been suggested, however, that some tests are multifactorial measures, and that adequate performance requires the normal functioning of many different abilities (e.g., psychomotor, visual-spatial, memory; Albert, 1981). Albert (1981) suggests the BGT has been determined to assess these factors. This would suggest that a single test, sensitive to brain dysfunction, would be all that is necessary to detect the impairment.

Administration of an elaborate neuropsychological test battery is usually neither realistic nor cost efficient for patients or examiners. There is no rationale for administering a three- to eight-hour procedure if a five-minute test can provide the same information. Further, the BGT appears to be more useful in detecting diffuse cortical damage than it does in diagnosing localized lesions. Russell (1976) reports that the BGT is especially sensitive to diffuse, slowly progressive types of cortical damage. This is particularly important because the kinds of neuropathology most frequently seen in psychiatric settings are diffuse, slowly progressive conditions such as arteriosclerosis, presenile dementia, alcoholism or cardiovascular

insufficiency (Russell, 1976). In a typical psychiatric setting, and for the typical referral question therefore, the BGT and perhaps the HOT can serve as a brief, inexpensive, low-risk, low-discomfort screening test for brain dysfunction.

Single tests and combinations of tests seem to give similar results. Smith (1975) found that the seven individual tests of the Halstead-Reitan produced about the same hit rate as the composite index of all seven tests. In fact, for differential diagnosis, the very brief BGT has demonstrated greater diagnostic accuracy with psychiatric patients than the lengthy Halstead-Reitan Battery of tests (Lacks et al., 1970).

There seems to be little evidence to suggest that a comprehensive neuropsychological test battery is more diagnostically accurate than a single test to determine the presence of organic brain dysfunction. Single reliable and valid tests provide almost the same level of diagnostic accuracy as combinations of tests.

The BGT was found to be the most frequently used test by psychologists (Lacks, 1984). The BGT was developed by Lauretta Bender in 1938 as a test to study the relationship of perception to various types of psychopathology. She adapted its nine figures from a larger number of designs developed by Wertheimer (1922) in his studies of principles of visual perception. In 1946, Bender published a summary of responses for each year of age from four through eleven years old and for adults (Lacks, 1984). Early in the history of the BGT, there was no formal system for quantifying test results; Lauretta Bender provided only a chart of some test responses indicating the maturational progression from age four through eleven.

Review of the Bender-Gestalt Test Scoring Systems

Pascal and Suttell

The first objective scoring system for quantifying BGT results was published by Pascal and Suttell (1951). Their system was complex, cumbersome, and very time-consuming. This is a complex system of measuring the degree of psychopathology through 105 possible deviations in reproducing the figures. Each design is inspected for ten to thirteen possible errors. The overall production is assessed for seven more configuration scores. Scores are converted to z-scores. The scoring manual fills one hundred pages. Some estimates of scoring time are as high as twenty minutes per protocol. Published diagnostic accuracies for organic dysfunction range from 63 percent to 88 percent, with a mean of 74 percent.

Hain System

The Hain System (1964) consists of fifteen signs. Each sign is scored once per record. Although this scoring system may be much more expeditious to use, it can only be obtained by writing the author, as they are not published. Hain (1964) indicated that his scoring system missed many individuals who did have brain damage, as have other tests of brain damage. It was his belief that "false negatives are to be expected from any single test that measures only one or a few dimensions of impairment associated with brain damage" (Hain, 1964, p. 40). He went on to conclude, "No single test can be expected to tap impairment associated with all types of brain damage" (Hain, 1964, p. 40). He also concluded that this system was likely to miss when tumors were present or when EEG focal epileptiform activity and/or seizures were the only evidence of brain damage. Diagnostic accuracies have ranged from 55 percent to 86 percent, with a mean of 70 percent (Lacks, 1984).

Hutt-Briskin

The Hutt-Briskin scoring method suggested the use of twelve "essential discriminators of intracranial damage" (Lacks, 1984, p. 16). Each protocol is evaluated for the presence or absence of the twelve signs and a score of five or more classifies a protocol as showing evidence or organic dysfunction. Published diagnostic accuracies using the Lacks adaptation of the Hutt-Briskin system (Lacks & Newport, 1980), with a standard cutoff score, achieved the highest levels of diagnostic accuracy at 84 percent.

Pauker Quick-Scoring System

The Pauker Quick-Scoring System (1976) takes about one minute per protocol. Each of the nine figures is rated on a zero to four scale of amount of deviation from the original stimulus. Total scores can range from zero to thirty-six. This scoring system is relatively new and is not yet fully researched. Results to date evidence diagnostic accuracies of 78 percent to 82 percent. These results, while promising, await cross-validation.

Koppitz Scoring Method

The Koppitz Scoring Method for Children (1963) appears to be the preferred scoring procedure for clinicians working with children aged five to ten. Reliability ranges from 79 percent to 89 percent. Evaluating the diagnostic accuracies of the above scoring system was undertaken by Lacks and Newport (1980). They chose to compare the following in their study: the Hutt-Briskin (1960), Hain (1964), Pauker Quick-Scoring (1976), and number of rotations. Results of the study demonstrated that for classifying organic and nonorganic individuals correctly, the Hutt-Briskin system was most successful with a mean of 84 percent, and the Pauker system was next with 79 percent correct. Both the Hain system and number of rotations demonstrate lower overall diagnostic accuracy (71 percent and 63 percent, respectively; Lacks, 1984).

Marley Scoring System

Marley (1982) did extensive research with stroke patients at the stroke clinic of York Hospital in York, Pennsylvania. She was experimenting with a scoring system that would eventually prove to be a refined technique for ascertaining the presence or absence of organic brain pathology with special reference to laterality, localization, inferred symptomatology, and prognosis. Reliability is reported to be high, however, she indicated that the scoring system would have to attain further refinement and more widespread use (Marley, 1982).

To provide an independent assessment of interscorer reliability on the Marley, a replication of that study was performed (DeCato & Meldrum, 1989). Kappa coefficients for the raters ranged from .94 to .98. Substantial interscorer reliability was obtained, Mdn = 92.5 percent for specific scores with three scores attaining 100 percent agreement.

The results suggest there is a strong empirical basis for the scoring system and encourage further refinement of the scoring system to reflect central nervous system dysfunction.

Summary and Conclusion

The HOT appears to be a useful neuropsychological assessment instrument that can provide mental health professionals with an easily administered valid screening tool to differentiate between organics and nonorganics. It is hopeful that through research in the area of early childhood learning and behavior deviations, the HOT may be useful as a neuropsychological assessment instrument in detecting such deviations, and localizing and isolating the area of impairment.

Another positive aspect of the HOT is in its quality of a culture- and language-free instrument. It requires no special language or educational skill endemic to any individual habitat or educational level. There would be further need to explore, however, rhythm and its effect on individuals in certain cultures in specific areas of the world. We may begin to understand differences in specific cultures, how they respond to rhythmic patterns, and its relationship to their development.

About the Authors

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References

Albert, M. S. (1981). Geriatric neuropsychology. *Journal of Consulting and Clinical Psychology, 49*, 835–50.

Bender, L. (1938). *A visual-motor Gestalt test and its clinical use.* New York, NY: American Orthopsychiatric Association.

Bender, L. (2003). *Bender Visual-Motor Gestalt Test* (2nd ed.). San Antonio, TX: The Psychological Corporation.

Bigler, E. D., & Ehrfurth, J. W. (1981). The continued inappropriate singular use of the Bender Visual-Motor Gestalt Test. *Professional Psychology, 12*(5), 562–9.

Brilliant, P. J., & Gynther, M. D., (1963). Relationships between performance on three tests for organicity and selected patient variables. *Journal of Consulting Psychology, 27*(6), 474–9.

Chapman, A. H. (1976). *Textbook of clinical psychiatry: An interpersonal approach* (2nd ed.). Philadelphia, PA: Lippincott, Williams, and Williams.

Chapman, B. C. (1987). Screening for organicity: A comparison of two neuropsychological procedures. *Dissertation Abstracts International, 48*(11), 3410–B.

Davidson, L. A. (1974). Introduction. In R. M. Reitan & L. A. Davison (Eds.), *Clinical neuropsychology: Current status and applications.* New York, NY: John Wiley & Sons.

DeCato, C. M., & Meldrum, D. (1989). Confirmation of interrater reliability of the Marley Differential Diagnostic scoring system for the Bender-Gestalt Test. *Perceptual and Motor Skills, 68*(3 Pt. 1), 915–20.

Elizur, A. (1993). *Elizur Test of Psycho-Organicity.* Los Angeles, CA: Western Psychological Services.

Freedman, A. M., & Kaplan, H. I. (Eds.). (1972). *Diagnosing mental illness: Evaluation in psychiatry and psychology.* New York, NY: Atheneum.

Golden, C. J., Hammeke, T. A., & Purisch, A. D. (1978). Diagnostic validity of a standardized neuropsychological battery derived from Luria's neuropsychological tests. *Journal of Consulting and Clinical Psychology, 46*(6), 1258–65.

Hain, J. D. (1964). The Bender-Gestalt Test: A scoring method for identifying brain damage. *Journal of Consulting Psychology, 28*(1), 34–40.

Hartman, H. J. (1992). Review of the Short Category Test. In J. J. Kramer & J. C. Conoley (Eds.), *The eleventh mental measurements yearbook.* Lincoln, NE: University of Nebraska Press.

Heaton, R. K., Baade, L. E., & Johnson, K. L. (1978). Neuropsychological test results associated with psychiatric disorders in adults. *Psychological Bulletin, 85*(1), 141–62.

Heaton, R. K., Vogt, A. T., Hoehn, M. M., Lewis, J. A., Crowley, T. J., & Stallings, M. A. (1979). Neuropsychological impairment with schizophrenia vs. acute and chronic cerebral lesions. *Journal of Clinical Psychology, 35*(1), 46–53.

Hoffman, N. E. (1974). *Hear the music! A new approach to mental health.* Boynton Beach, FL: Star Publishing Co.

Hoffman, N. E. (1975). *Hoffman test for organicity.* West Palm Beach, FL: Proof Press.

Horton, A. M., Anilane, J., & Berg, R. A. (1988). Efficacy of Satz-Mogel Short Forms of the Luria-Nebraska Battery for the differential diagnosis of organic vs. psychiatric patients. *Psychotherapy in Private, 50*(4), 65-68.

Horton, A. M., & Wedding, D. (1984). *Clinical and behavioral neuropsychology: An introduction.* New York, NY: Praeger.

Hutt, M. L., & Briskin, G. J. (1960). *The clinical use of the revised Bender-Gestalt Test.* New York, NY: Grune & Stratton.

Klein, D. F., & Davis, J. M. (1969). *Diagnosis and drug treatment of psychiatric disorders.* Baltimore, MD: Williams & Wilkins Co.

Koppitz, E. M. (1963). *The Bender-Gestalt Test for young children.* New York, NY: Grune & Stratton.

Korman, M., & Blumberg, S. (1963). Comparative efficiency of some tests of cerebral damage. *Journal of Consulting Psychology, 27*, 303–9.

Lacks, P. B., Harrow, M., Colbert, J., & Levine, J. (1970). Further evidence concerning the diagnostic accuracy of the Halstead Organic Test Battery. *Journal of Clinical Psychology, 26*(4), 480–1.

Lacks, P. B. (1984). *Bender-Gestalt screening for brain dysfunction.* New York, NY: John Wiley & Sons.

Lacks, P. B., & Newport, K. A. (1980). A comparison of scoring systems and level of scorer experience on the Bender-Gestalt Test. *Journal of Personality Assessment, 44*(4), 351–7.

Lezak, M. D. (1976). *Neuropsychological assessment.* New York, NY: Oxford University Press.

Luria, A. R. (1993). *Luria-Nebraska Neuropsychological Battery.* Los Angeles, CA: Western Psychological Services.

Malec, J. (1978). Neuropsychological assessment of schizophrenia versus brain damage: A review. *Journal of Nervous and Mental Disease, 166*(7), 507–16.

Marley, M. L. (1982). *Organic brain pathology and the Bender-Gestalt Test: A differential diagnostic scoring system.* New York, NY: Grune & Stratton.

Menninger, K. A. (1959). *A psychiatrist's world: The selected papers of Karl Menninger, MD.* New York, NY: The Viking Press.

Mezzich, J. E., & Moses Jr., J. A. (1980). Efficient screening for brain dysfunction. *Biological Psychiatry, 15*(2), 333–7.

Oberleder, M. (1967). Adapting current psychological techniques for use in testing the aging. *Gerontologist, 7*(3), 188–191.

Parsons, O. A., & Prigatano, G. P. (1978). Methodological considerations in clinical neuropsychological research. *Journal of Consulting and Clinical Psychology, 46*, 608–19.

Pascal, G. R., & Suttell, B. J. (1951). *The Bender-Gestalt Test.* New York, NY: Grune & Stratton.

Paker, J. D. (1976). A quick-scoring system for the Bender-Gestalt: Interrater reliability and scoring validity. *Journal of Clinical Psychology, 32*(1), 86–9.

Reitan, R. M. (1993). *Halstead-Reitan Neuropsychological Test Battery Composite Battery.* Tucson, AZ: Reitan Neuropsychology Laboratory.

Russell, E. W. (1976). The Bender-Gestalt and the Halstead-Reitan Battery: A case study. *Journal of Clinical Psychology, 32*(2), 355–61.

Satz, P., Fennell, E., & Reilly, C. (1970). Predictive validity of six neurodiagnostic tests: A decision theory analysis. *Journal of Consulting and Clinical Psychology, 34*(3), 375–81.

Smith, A. (1975). Neuropsychological testing in neurological disorders. In W. J. Friedlander (Ed.), *Advances in neurology* (vol. 7, pp. 49–110). New York, NY: Raven.

Snow, J. (1992). Review of the Luria-Nebraska Neuropsychological Battery. In J. J. Kramer & J. C. Conoley (Eds.), *The eleventh mental measurements yearbook.* Lincoln, NE: University of Nebraska Press.

Spreen, O., & Benton, A.L. (1965). Comparative studies of some psychological tests for cerebral damage. *Journal of Nervous and Mental Disease, 140*, 323–33.

Walsh, K. W. (1978). *Walsh's neuropsychology: A clinical approach.* New York, NY: Churchill Livingstone.

Wertheimer, M. (1922). Studies in the theory of Gestalt psychology. *Psychologische Forschung, 4*, 301–50.