

DIFFERENTIATION OF SCHIZOPHRENICS WITH AND WITHOUT BRAIN DAMAGE USING THE WHITAKER INDEX OF SCHIZOPHRENIC THINKING

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Assessed the efficacy of the Whitaker Index of Schizophrenic Thinking, Form A, in differentiating schizophrenics with and without brain damage. Two groups of 26 state hospital residents each were selected on the basis of evidence of schizophrenia and (or lack of evidence) of brain damage. Results indicated that at least one subtest, total time, and Index significantly discriminated between groups. Additionally, a cut-off index reliably discriminated schizophrenics with brain damage. Discussed were implications for diagnosis and treatment of the populations examined as well as the relationship between brain dysfunction and cognitive processes of schizophrenia.

An important consideration of clinical neuropsychology has been the differential diagnosis of organic and functional disorders (Lezak, 1977). Although numerous investigations (Albott & Gilbert, 1973; Purisch, Golden, & Hammeke, 1978; Watson, Thomas, Felling, & Anderson, 1969) have reported the efficacy of various tests in differentiating brain damage from schizophrenia, the problem of differentiating schizophrenia with and without brain damage has received relatively little attention. This investigation assessed the efficacy of a quick screening test of verbal concept formation, the Whitaker Index of Schizophrenic Thinking (WIST) (Whitaker, 1973), in detecting occurrence of brain damage in schizophrenia.

METHOD

Subjects

From the inpatient population at Northeast Florida State Hospital's Unit II, two groups (i.e., brain-damaged and non-brain-damaged) of schizophrenics volunteered. All participants read, comprehended, and signed informed consent forms as well as met Shearn and Whitaker's (1969) criteria for the selection of schizophrenic Ss. Participants were matched on age, gender, education, age of onset, length of hospitalization, and occurrence of previous hospitalization (cf. Table 1).

TABLE 1
BIOGRAPHICAL CHARACTERISTICS

	Schizophrenics with brain damage	Schizophrenics without brain damage
Age	38.46	37.77
Gender	Male = 17 Female = 9	Male = 18 Female = 8
Education	9.26	11.96
Length of hospitalization (days)	522.26	299.50
Age of onset (years)	30.44	26.45
Previous hospitalization	Yes = 20 No = 6	Yes = 20 No = 6

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Diagnosis of schizophrenia for the 52 Ss (26 per group) was determined by a clinical psychologist, who used the DSM-III criteria (American Psychiatric Association, 1979) in conjunction with history and chart diagnosis. Evidence of organicity for the damaged group was based on detection of brain impairment by neurological examinations by a qualified physician and/or tests such as CAT scan, skull X-ray, and EEG. No schizophrenic was included in the non-damaged group for whom there was any evidence of brain damage as revealed by interviews, histories, examinations, and/or tests.

Procedure

Participants were administered individually Form A of the Whitaker Index of Schizophrenic Thinking (WIST) in an isolated lobby of respective wards by the junior author, who was blind to diagnosis. Time and order of testing were randomized. Scoring was done by a technician unaware of the purpose of the study.

RESULTS

Group comparisons were assessed via analyses of variance (ANOVA) on each of the three subtests (i.e., Similarities, Word Pairs, and New Inventions), total time, and Index (i.e., subtest scores plus total time). Although there were differential group effects for each of the subtests in the direction of higher scores for the brain-damaged schizophrenics, only the Word Pairs subtest scores (means were 2.46 and 5.85, respectively) showed significant between-group differences, $F(51, 1) = 4.30, p < .05$. Significant differences also were noted for the time factor, $F(51, 1) = 9.93, p < .05$. Brain-damaged Ss took approximately three times longer (i.e., 11.50 minutes) than non-brain-damaged participants. Finally, results indicated significant differential group effects on the Index, $F(51, 1) = 4.11, p < .05$. The means, 25.5 and 17.5, respectively, suggest that brain-damaged schizophrenics scored higher on the Index.

Additionally, a cut-off index of 21, equidistant between the Index means, was adopted. Of the 26 brain-damaged schizophrenics, 21, or 81%, scored higher than this criterion, while 58% of the non-damaged group scored lower than this value. Ss in the latter group who scored higher than 21 tended to be young, male, acute, and hospitalized for the first time.

DISCUSSION

These findings indicate that at least one subtest and total time as well as the Index of the WIST significantly discriminate between schizophrenics with and without brain damage. Also, it appears that a cut-off index of 21 identifies schizophrenics with brain damage.

In view of the fact that the WIST measures verbal cognitions, it is suggested that nervous system damage exacerbates already existing deficiencies in verbal cognitive processes of schizophrenics. Consequently, a more diverse therapeutic approach that considers both the organic and functional aspects of the disorder is indicated (cf. Golden, 1977).

It is interesting to note that Whitaker (1973) reported that a cut-off index of 20 provided 80% discriminatory efficiency in identifying schizophrenic patients. However, the cut-off index arrived at in the present study is similar to that provided by Whitaker for the Index of schizophrenics tested between two and three weeks after admission. The question arises whether patients tested by Whitaker (1973) had brain dysfunction not clearly evident or documented. Prior to consideration of this question, however, replication of the present study is indicated due to the limited sample size and educational discrepancy (cf. Pishkin, Lovallo, Lenk, & Bourne, 1977). It is expected, nevertheless, that differentiation between schizophrenics with and without brain damage on verbal cognitive tasks will be directly attributable to degree and not evidence of diffuse left hemisphere dysfunction.

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LOGICAL REASONING DEFICITS IN SCHIZOPHRENIA AND BRAIN DAMAGE¹

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Von Domarus and Arieti have theorized that failure to reason by conventional logical rules is at the root of schizophrenic thought disorder, but the available research on this view is inconclusive. We compared the performance of schizophrenics ($N = 100$), brain-damaged patients ($N = 50$) and psychiatric controls ($N = 50$) on closely matched measures of Overexpansive and "Von Domarus" (similarity implies identity) syllogistic reasoning errors. Before the samples were matched for education and intelligence, the brain-damaged and schizophrenic patients made more Overexpansive errors than the controls, but the Von Domarus error difference was not significant. After matching, both differences were nonsignificant. The results indicate that inability to use syllogistic reasoning properly is probably not the root cause of schizophrenic thought disorder.

Von Domarus (1964) and Arieti (1955) have theorized that schizophrenics reason by different rules of logic from others and that this tendency may explain their irrational thought and speech. In particular, Von Domarus believed that schizophrenic reasoning is dominated by the principle that two objects are identical when they share a common attribute. Arieti espoused a similar view, but believed inappropriate logic in schizophrenics was limited to subject material with emotional content.

Only a limited number of studies have been run to test these hypotheses. Nims (1959), Williams (1964), Wyatt (1965), and Jacobs (1969) reported predominantly nonsignificant differences between schizophrenics and controls on their syllogism tests, but Chapman and Chapman (1973) have suggested that

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