

# Intelligence Measurement and Mental Disorder

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## SUMMARY

Certain quantitative intelligence test patterns which may assist in differentiating between normal, schizophrenic and psychopathic subjects are presented. Acute and chronic schizophrenics do not differ significantly from each other, but a distinct pattern emerges between schizophrenics and normals. This pattern is mainly reflected in the performance IQ. The IQ pattern of psychopathy is not very different from that of normal persons.

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The South African Wechsler Adult Intelligence Scale has been in use since 1960.<sup>1</sup> A final form of the test was published by the SA National Institute for Personnel Research in 1969.<sup>2</sup>

This scale provides a clinical measure of intelligence, and has an index of deterioration. Insight into personality and thought processes of normal, neurotic and pathological groups of persons may also be gained from it. The test consists of 11 subtests, each comprising a different intellectual function. There are 6 verbal tests including tests of vocabulary, general knowledge, comprehension, memory, concept formation and arithmetical reasoning. The five non-verbal or performance tests include aspects of visual organisation, visual-motor co-ordination, social awareness and task adaptation.

Three scores may be computed from the test, namely verbal, performance and full IQ scores. Ten tests are usually used for a diagnostic investigation and the vocabulary test is used for the specific diagnosis of long-term premorbid intellectual development which may be retained during organic impairment.

Due to the usefulness of the SA Wechsler Test as a clinical diagnostic instrument, it has become a standard test for the clinical assessment of adults above 18 years of age.

Extensive clinical use of this test by the author has shown certain quantitative test patterns which may serve to assist in the diagnosis of various clinical conditions. This type of patterning of scores is termed subtest scatter. Many controversies have raged as to the usefulness of scatter analysis and the matter is far from settled. Due to the fact that certain quantitative test patterns were found in certain groups of patients, the author has felt the need to present some of these findings.

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## PATIENTS AND METHOD

A number of groups of persons were tested over a period of 8 years. The groups comprised 86 normal persons, 36 schizophrenics (18 chronic institutionalised patients and 18 acute non-institutionalised patients) and 36 psychopaths. The pathological groups were diagnosed by a number of psychiatrists according to standard criteria.<sup>3</sup>

The normal group was selected from various persons including colleagues, hospital staff members, parents of children attending for vocational guidance, and students. The psychopathic group was selected from patients who were attending a psychiatric hospital. The groups were tested on 10 subtests of the Wechsler Scale. The vocabulary test was excluded for computational reasons.<sup>4</sup>

In order to study the possible effects of institutionalisation, two groups of schizophrenic patients were selected, namely, a group of 18 schizophrenics who had been ill from between 2 and 8 years, and a group of 18 schizophrenics who had been ill for 1 year or less. Patients with brain injury were as far as possible excluded.

The first group of patients had received ECT in varying amounts before testing, and at various stages of their illnesses, but their present condition was considered chronic. They had been placed on maintenance medication at the time of testing. The second group was tested before the administration of treatment, and the patients were considered to be in an acute phase of the illness.

## RESULTS

The results are presented in two patterns, namely the full, verbal and performance IQ scores; and the specific 10 subtest scatter patterns.

Statistical significance was determined by means of Student's *t*-tests.

The results are shown in Tables I, II and III, and a graphic presentation of comparative results appears in Fig. 1.

Two groups of schizophrenics were tested, namely 18 chronic and 18 acute schizophrenics. The results are presented in Table II.

## DISCUSSION

In terms of full, verbal and performance IQ scores it is noted that normal persons tend to have a full IQ score of approximately 100. The schizophrenics display a particular pattern with high verbal, low performance and low-average full IQ scores.<sup>5</sup> The 19.8 point discrepancy between



TABLE I. FULL, VERBAL AND PERFORMANCE IQ SCORES

	86 Normals		36 Schizophrenics		36 Psychopaths	
	Mean	SD	Mean	SD	Mean	SD
Full IQ	101,5	± 17,3	90,1	± 17,1	102,9	± 14,45
Verbal IQ	104,4	± 16,7	100,2	± 17,3	101,15	± 14,9
Performance IQ	98,5	± 19,0	80,4	± 17,2	104,05	± 14,5
V IQ > P IQ		NS	V IQ > P IQ	P=0,01 S	V IQ < P IQ	NS
V IQ > F IQ		NS	V IQ > F IQ	P=0,05 S	V IQ < F IQ	NS
F IQ > P IQ		NS	F IQ > P IQ	P=0,05 S	F IQ < P IQ	NS

Normals		Schizophrenics	
Full IQ	>	Full IQ	P=0,01 S
Verbal IQ	>	Verbal IQ	NS
Performance IQ	>	Performance IQ	P=0,01 S

Normals		Psychopaths	
Full IQ	<	Full IQ	NS
Verbal IQ	>	Verbal IQ	NS
Performance IQ	<	Performance IQ	P=0,05 S

TABLE II. SCHIZOPHRENICS

	18 Chronic		18 Acute	
	Mean	SD	Mean	SD
Full IQ	87,9	± 18,2	92,2	± 15,9
Verbal IQ	95,3	± 18,5	105,0	± 15,9
Performance IQ	81,2	± 17,3	79,6	± 17,0
Ages	38,7	± 8,4	>	27,1 ± 12,9
			P=0,01 S	
Subtest patterns				
Information	9,3	± 3,0	10,6	± 2,8
Comprehension	10,2	± 2,1	11,5	± 2,6
Arithmetic	7,8	± 2,3	9,2	± 2,4
Digit span	9,5	± 2,0	10,4	± 2,0
Similarities	10,7	± 2,0	10,9	± 2,0
Picture completion	8,7	± 2,7	8,4	± 2,6
Object assembly	7,6	± 1,8	6,9	± 2,4
Block design	7,7	± 1,7	7,7	± 2,2
Digit symbol	7,4	± 2,4	8,1	± 1,6
Picture arrangement	8,8	± 2,6	8,0	± 2,2

Apart from age differences no significant differences emerged on the IQ and subtest patterns of these groups, and it was decided to combine the scores to form one group of 36 schizophrenic patients (Table I).

the verbal and performance IQs is diagnostically significant ( $P < 0,01$ ). The psychopathic group tends to approximate the normal group except that there is a significant tendency towards a high performance IQ ( $P < 0,05$ ). Comparing normals with schizophrenics it is apparent that there are significant differences ( $P < 0,01$ ) between their full IQ and performance IQ scores.

Table II presents a comparison between two groups of chronic and acute schizophrenics. These groups do not differ significantly from each other, and the long-term effects on the Wechsler Intelligence Test performance of the group of chronic schizophrenics do not appear to be different from the effects found in the acute stage. The verbal subtests of the chronic and acute schizophrenics, which may be expected to be sensitive to the effects of institutionalisation, do not differ significantly from each other. The estimated premorbid IQ levels of these groups appear to be similar.

Table III presents the subtest scatter patterns. The comprehension subtest is significantly higher for normals than for schizophrenics ( $P < 0,05$ ), and all of the performance subtests, namely, picture completion, object assembly, block design, digit symbol, and picture arrangement are significantly lower in the schizophrenics ( $P < 0,01$ ). The object assembly subtest is the only test in which the psychopaths are significantly superior to the normals ( $P < 0,05$ ). This may indicate a motor manipulative quality in this group.

The poor comprehension scores of schizophrenics may suggest impaired judgement in this group. The poor performance subtests of schizophrenics may be indicative of problems of visual organisation, visual motor co-ordination, poor analytical ability, poor task adaptation and poor social awareness.<sup>4</sup>

Fig. 1 portrays a graphic picture of schizophrenic impairment on the Wechsler Test as compared with normals and psychopaths.

## CONCLUSIONS

It is felt that the specific test patterns which emerge in the comparison of normals, psychopaths and schizophrenics on the SA Wechsler Test may provide the clinician with

TABLE III. SUBTEST SCATTER — COMPARISON BETWEEN NORMALS, SCHIZOPHRENICS AND PSYCHOPATHS

Subtests	86 Normals		36 Schizophrenics			36 Psychopaths		
	Mean	SD	Mean	SD	Significance P	Mean	SD	Significance P
Information	10,1 ±	2,6	9,9 ±	2,9		9,4 ±	2,2	
Comprehension	11,8 ±	2,2	10,8 ±	2,4	0,05	11,1 ±	1,7	
Arithmetic	9,3 ±	2,1	8,5 ±	2,4		8,8 ±	2,1	
Digit span	10,6 ±	1,8	9,9 ±	2,0		10,6 ±	1,7	
Similarities	11,4 ±	2,2	10,8 ±	2,0		10,9 ±	2,0	
Picture completion	10,8 ±	2,7	8,5 ±	2,7	0,01	11,3 ±	2,3	
Object assembly	9,1 ±	2,3	7,3 ±	2,1	0,01	9,9 ±	1,9	0,05
Block design	9,4 ±	2,3	7,7 ±	2,0	0,01	9,7 ±	2,3	
Digit symbol	9,5 ±	2,3	7,7 ±	2,0	0,01	9,5 ±	2,6	
Picture arrangement	11,0 ±	2,6	8,4 ±	2,4	0,01	11,7 ±	2,3	
Ages	36,8 ±	12,8	32,9 ±	10,7		30,9 ±	9,62	

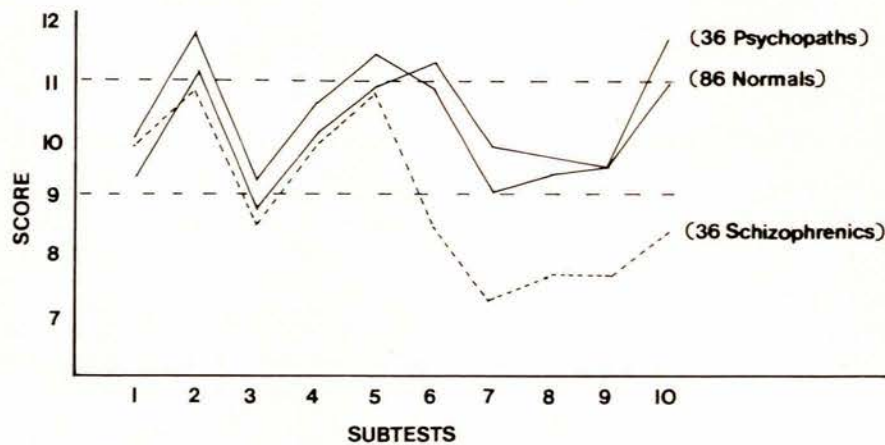


Fig. 1. Wechsler patterns of normals, schizophrenics and psychopaths.

an aid to the diagnosis of schizophrenia. The diagnosis of psychopathy may not be a simple matter, due to the approximation of the performance of psychopaths with that of the normals.

Discrepancies between full, verbal and performance IQ scores may indicate certain forms of psychopathology. Specific subtest score patterns may prove to be diagnostically meaningful, but should be viewed with caution due to controversies as to the value of such patterns.

## REFERENCES

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