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Speed of Function, Thought-Process Disorder and Flattening of Affect

By JOAN DRAFFAN

Retardation, i.e. abnormal slowness in performing mental and/or motor tasks, is frequently noted as being a prominent feature of schizophrenia. While some writers describe it as being merely one of the several clinical signs and symptoms of schizophrenia, others suggest that retardation has a *causative* role, and is a basic disorder underlying antisociability and withdrawal from reality (Babcock, 1933), intellectual deficit (Shapiro and Nelson, 1955), affective flattening (Harris and Metcalfe, 1956), thought-process disorder (e.g. Yates, 1966), and other disorders.

Studies of retardation as a *clinical sign* disagree as to whether it can be considered as a *unitary disorder* (Payne and Hewlett, 1960), affecting many aspects of behaviour, or whether it is useful to distinguish *mental* slowness from *psychomotor* slowness (Nelson, 1953). If Payne and Hewlett are correct, then the scores of a group of schizophrenics on tests of mental speed, such as Nufferno's, would be expected to show high, positive correlations with their scores on tests of psychomotor speed, such as those in the Babcock-Levy battery. If, on the other hand, Nelson is correct and mental and psychomotor speed are largely independent, then the correlations would be likely to be negligible.

A second question relating to retardation as a clinical sign is how it is distributed among the subcategories of schizophrenia. Studies of many aspects of schizophrenia (Shakow, 1962; Foulds *et al.*, 1967) suggest that it is useful to distinguish between *paranoid* schizophrenia and the *non-paranoid* varieties, i.e. hebephrenia, catatonia, and simple schizophrenia. Paranoid schizophrenics have been found to be faster on tests of psychomotor speed (Shakow and Huston, 1936; Payne and Hewlett, 1960; Payne *et al.*, 1964; Foulds *et al.*, 1968) and mental speed (Payne and Hewlett, 1960), although Wittenborn and Holzberg (1951) and Payne (1960) have suggested that psychotics with delusions tend to be slower. Foulds *et al.* (1969) found no differences between paranoid and non-paranoid schizophrenics on psychomotor speed.

Another frequently emphasized distinction within schizophrenia is between acute and chronic schizophrenia (Johannson *et al.*, 1963). Nelson (1953) found that chronic schizophrenics were slower than acutes, but the results of Foulds *et al.* (1969) and Senf *et al.* (1955) showed no significant differences. The theory of Hawks and Marshall (1971) allows the prediction that chronic schizophrenics would be slower than acutes, particularly on *mental* speed tests.

Considering retardation as a *cause* of other schizophrenic signs and symptoms, several writers have postulated that thought-process disorder is a result of abnormal slowness (Babcock, 1933) or specifically of a reduced rate of information processing (Yates, 1966). Foulds *et al.* (1969) and Presly (1969) found no relationship between thought process disorder and psychomotor speed. Slow information processing, as postulated by Yates (1966), is more likely to affect *mental* speed, and although he was supported by Court and Garwoli (1968), their results are ambiguous since they failed to distinguish the thought-process-disordered schizophrenics from those without thought-process disorder. Similarly, Hawks and Robinson (1971), while failing to confirm Yates' hypothesis, failed to classify schizophrenics in terms of thought-process disorder. A positive relationship between thought-process disorder and 'speed slope' on the Nufferno speed tests would be predicted from Yates' theory, since 'speed slope' represents the increase in time taken to process increased information.

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Retardation has also been said to be the basic disorder underlying flattening of affect (Babcock, 1933; Harris and Metcalfe, 1956). Harris and Metcalfe supported this, using tests of both mental and psychomotor speed and clinical ratings of flattened affect. A different interpretation of affective flattening has recently been proposed by McPherson *et al.* (1970a, b), who relate it to the absence of a coherent personal construct subsystem (Kelly, 1955) for evaluating and differentiating people's 'psychological' attributes, i.e. those to do with personality and emotion. Among schizophrenics, affective flattening, as rated clinically, has been shown to be significantly correlated with the use which they make of 'psychological' as opposed to 'non-psychological' constructs (Dixon, 1968; McPherson *et al.*, 1970a, b). Buckley (1969) found that those schizophrenics who used few 'psychological' constructs were significantly slower on one psychomotor test, but the relationship with mental speed has not yet been established.

The aims of the present study are, therefore, to investigate (i) whether mental retardation can be distinguished from psychomotor retardation, or whether reduced speed of functioning in schizophrenics should be considered as a unitary disorder; (ii) whether paranoid schizophrenics differ from non-paranoid schizophrenics on tests of mental and psychomotor speed; (iii) the degree of the relationship between chronicity in schizophrenia and speed of function; (iv) the degree of the relationship between thought-process disorder and retardation; and (v) the degree of the relationship between flattening of affect and retardation.

Method

Subjects

Twenty-four schizophrenics, 17 male and 7 female, from the admission wards of a general psychiatric hospital were tested. In addition to having an undisputed clinical diagnosis of schizophrenia, the patients were all less than 65 years of age (mean age 32·6 years, S.D. 13·8 years); had no known brain damage; were not receiving ECT; and had obtained a score of at least 15 on the Mill Hill Synonyms Selection Test (mean score 28·2; S.D. 5·39; 42nd percentile for general population).

The group comprised 7 paranoid and 17 non-paranoid schizophrenics as diagnosed by the Symptom Sign Inventory (Foulds and Hope, 1968); and 11 acute and 13 chronic patients, the term chronic being applied to those schizophrenics who had first been admitted at least two years previous to the date of testing (Brown, 1960).

Procedure

The patients were tested individually in a room on the ward. Testing extended over two sessions, with never more than one night intervening between the two. Two patients, both paranoid schizophrenics, refused to take part in the testing. A further four patients did not complete the Nufferno Speed Tests.

Measures

1. *Speed*

(a) *Psychomotor speed*

(i) *Babcock-Levy Battery.* The 'speed of writing' subtests were administered, but as advised by Foulds *et al.* (1969), 'Writing Name' was omitted. The time taken to write each sentence was noted.

(ii) *GATB motor speed test.* Form B–1002, Test 8. The score recorded was the number of digits correctly coded in 90 seconds after a short practice.

(iii) *WAIS digit symbol test.* The score recorded was the number of digits correctly coded in 90 seconds after a short practice.

(b) *Mental Speed*

(i) *Nufferno speed tests.* The tests were administered and scored in accordance with the instructions for individual administration in the manual (Furneaux, 1956). Speed scores were obtained, in the following order, for (i) A(2) unstressed; (ii) B(1) unstressed; (iii) A(1) stressed. The speed slope score, B(1) — A(2), was also calculated.

2. *Flattening of affect*

Dixon's (1968) technique was used. The usefulness of this technique in differentiating between flattened and non-flattened schizophrenics, and its high reliability, are well established (Dixon, 1968; McPherson *et al.*, 1970a, b; Rush, 1970). The method of scoring followed McPherson *et al.* (1970a): first responses within each category, for each pair of photographs were considered, and the proportion of psychological responses to the total number of response was calculated.

3. *Thought process disorder*

The Bannister-Fransella Grid Test (1966) was

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used, and standard administration was followed. Intensity and Consistency scores were calculated.

4. *Symptom-Sign Inventory* (SSI)

The 'Personal Disturbance Scale', the 'Delusion Scale' and the 'Non-paranoid vs. Paranoid Schizophrenic' scale were administered.

5. *Mill Hill Synonyms Selection Test* (1948)

Senior Set B was administered.

The SSI was administered first, followed by the Mill Hill Scale, the Bannister-Fransella Grid Test, the Nufferno Speed tests, the Dixon technique, and finally the psychomotor speed tests.

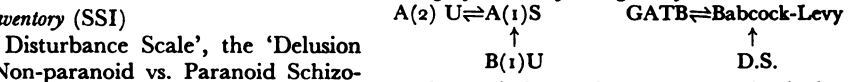
Results

The term 'retardation' has been used somewhat guardedly throughout this paper, because the average scores of the schizophrenics on the tests were not markedly different from normal. For example, in the Nufferno Speed Tests, the mean score on A(2) unstressed was 186·3 (S.D. 14·4) which is at the 47th percentile for the general population; on the Digit Symbol, the mean score was 38·0 (S.D. 11·9), which is at the 53rd percentile for the general population. The wide variation in the scores is an obvious feature, and this will be discussed in another paper.

1. *Intercorrelations of speed tests.* The results of the speed tests were intercorrelated, and the matrix of correlations in Table I was obtained. A McQuitty Elementary Linkage Analysis confirmed what can be seen clearly on inspection (see Fig. 1). The tests fall neatly into two non-overlapping clusters, with no tendency for them to form part of a general speed cluster; the correlations of every member within each cluster is significant, and higher than it is with any member of the other cluster.

Fig. 1.

McQuitty elementary linkage analysis



One of these clusters comprised the tests of mental speed, the other one comprised those of psychomotor speed. A 'mental speed index' and a 'psychomotor speed index' were computed by converting the scores within each test into Z-scores, and summing those within each cluster; these were used in subsequent calculations.

These findings clearly support those of Nelson (1953) and Foulds *et al.* (1969) that, in schizophrenics, mental slowness can be distinguished from psychomotor slowness. If relevant tests were included, a third cluster of 'perceptual speed', such as Rimoldi (1951) found while working with normal subjects, might emerge within schizophrenics.

2. *Paranoid and non-paranoid schizophrenics on speed tests.* The paranoids obtained mean scores of 6·44 (S.D. 2·16) and 6·63 (S.D. 2·11) on the mental and psychomotor speed indices respectively, compared with the non-paranoids' mean scores of 4·85 (S.D. 2·72) and 5·84 (S.D. 2·65). High scores are associated with a faster performance, and although paranoid schizophrenics tended to be faster than non-paranoids the range of scores within each group was so wide that neither the differences in the mental nor the psychomotor speed indices were statistically significant (Mann-Witney U values 37 and 46 respectively). This confirms the findings of Foulds *et al.* (1968).

3. *Chronicity and speed of functioning.* The mental

Table I

Intercorrelations among the speed tests

	B(1) U	A(1) S	D.S.	GATB	Babcock-Levy
A(2) U	·69	·77	·28	·18	−·01
	$p<·01$	$p<·01$			
B(1) U		·69	·13	·17	−·04
A(1) S		$<·01$	·23	·27	−·02
D.S.				·78	·69
				$p<·01$	$p<·01$
GATB					·84
					$p<·01$

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and psychomotor speed indices were each correlated with years of chronicity, with age partialled out. The correlations were 0·08 and 0·33 respectively, neither of which reached significance. Thus Nelson's (1953) finding that chronic schizophrenics were slower than acutes is tentatively supported only for psychomotor speed. Hawks and Marshall's (1971) theory that schizophrenics learn to combat the distractibility and overinclusiveness of the early stages of their illness by slowing down the rate at which they respond was not supported. It was predicted that mental speed would be more affected, and in the present study psychomotor speed showed a closer relationship with chronicity. On mental speed, although it is not possible to say whether the faster schizophrenics in the present group were overinclusive, they were not significantly more acute than the slower ones.

4. *Thought-process disorder and speed.* The Intensity score of the Bannister-Fransella Grid Test correlated 0·13 and 0·23 with the mental and psychomotor speed indices respectively, and the Consistency score correlated −0·18 and 0·06 with the mental and psychomotor speed indices. None of these correlations reach a significant level. Similarly, the correlations between Intensity and Consistency and the speed slope score on the Nufferno Speed tests were non-significant (−0·15 and −0·21 respectively). When the patients were divided into thought-disordered and non-thought-disordered following Bannister and Fransella's (1966) suggested cut-off points, there were no significant differences between them on either of the speed indices (Mann-Witney U = 35 and 43 for mental and psychomotor speed respectively).

These findings confirm those of Presly (1969), and thereby fail to support Yates' (1966) theory.

5. *Flattening of affect and speed.* The correlations between the percentage use of psychological constructs on the Dixon test, and the mental and psychomotor speed indices (−0·03 and 0·23 respectively) were non-significant.

These results fail to confirm those of Harris and Metcalfe (1956). It could be argued that the relationship did not emerge because the patients in the present group were not retarded. However, only the grossly flattened schizophrenics in Harris and Metcalfe's sample were slower than normals. The speed scores of the five most affectively flattened patients in the present group were not, on inspection, in the slowest group on either psychomotor or mental speed, and similarly negative results were obtained when the flattening of affect scores of the five slowest patients were examined. Thus it does not appear that the results of the less affectively flattened patients are concealing a strong relationship between flattening and retardation in the more flattened.

Harris and Metcalfe suggested that severity of illness might be responsible for the covariation between speed of functioning and flattening of affect. In support of this is Shakow's (1962) report of a significant correlation between 'a reaction time index and ratings of mental health'. It may have been that the range of degree of illness was not as great in the present study as in Harris and Metcalfe's, with the result that the relationship between flattening of affect and retardation did not emerge.

Summary

The speed of function of a group of 24 schizophrenics was examined in a variety of tests. The results indicated that:

1. Mental speed can be distinguished from psychomotor speed within schizophrenics.
2. Non-paranoid schizophrenics were not significantly slower than paranoid schizophrenics on either psychomotor or mental speed.
3. Neither psychomotor nor mental speed was significantly related to chronicity.
4. Neither psychomotor nor mental speed was related to thought process disorder, as measured by the Bannister-Fransella Grid Test.
5. Neither psychomotor nor mental speed was related to flattening of affect as measured by Dixon's (1968) technique.

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