BREADTH OF ATTENTION AND SOCIAL WITHDRAWAL IN HALLUCINATED AND NON-HALLUCINATED CHRONIC SCHIZOPHRENICS

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Summary

1 The relationship between the degree of social withdrawal and breadth of attention in 24 cronic non-paranoid schizophrenics was investigated by relating clinical ratings of withdrawal to performance on a card sorting task.

2. The results obtained by Venables (1963) confirming this relationship could not be replicated for the whole group. The experimental design differd in some aspects from the Venables design.

3. Results were suggestive of a qualitative difference between hallucinated and non-hallucinated schizophrenics. In the hallucinated group, more withdrawn patients showed a narrower span of attention than less withdrawn patients; this relationship could not be seen in the non-hallucinated group.

Recent research in schizophrenia has been repeatedly focussed on the nature of disturbances in cognitive function and on the correlation of measures of these disturbances with measures of physiological arousal and of social withdrawal. A number of studies have submitted evidence that chronic schizophrenics show a defect of attention characterised by an inability to attend selectively to a relevant stimulus dimension (Weckowitz and Blewett, 1959; McGhie and Chapman, 1961; Chapman and McGhie, 1962; Lawson *et al.*, 1964; Sutton *et al.*, 1961; Lawson *et al*, 1967; Chapman, 1966.)

It is also generally agreed that chronic schizophrenics have higher basal levels of physiological arousal than normal controls. (Malmo and Shagass, 1949a; Whatmore and Ellis, 1958; Reynolds, 1962; Malmo *et al.*, 1951; Goldstein *et al.*, 1965.) Venables and Wing (1962) have shown that more withdrawn patients show a higher degree of cortical arousal than less withdrawn patients, and Venables (1963), using performance on a card sorting task as a measure of selectivity of attention, has shown that more withdrawn, and hence more highly aroused, chronic non-paranoid schizophrenics show a narrower span of attention than non-withdrawn patients. These findings are compatible with the suggestion that increases in arousal levels lead to a decrease in the utilisation of peripheral cues. (Easterbrook, 1959; Callaway *et al.*, 1958.)

The concept of heightened arousal and impaired selectivity of attention, though undoubtedly attractive, has not been fully accepted and a number of related hypotheses have been proposed

which acount for a large number of observed phenomena. (Broen and Storms, 1961; 1966; Storms and Broen, 1969; Silverman, 1964; 1967; Shakow, 1962.)

Most of the studies listed above were carried out on chronic non-paranoid schizophrenics; although the paranoid non-paranoid subdivision of a chronic schizophrenic sample for experimental investigation is a useful and vital one, it was felt that other clinical aspects of the illness should be taken into consideration; " . . . something is lost in lumping this (non-paranoid) group" (Shakow, 1969.) and Raeburn and Tong (1968) have shown that certain notions on schizophrenic performance do not necessarily correspond with the intensity of a delusional state.

For this reason selectivity of attention and social withdrawal were measured in a small group of chronic non-paranoid schizophrenics and the results then analysed in terms of the presence of auditory or visual hallucinations at any time during the patient's recent history. Social withdrawal was measured by appropriate clinical rating scales and selectivity of attention was measured by means of a card sorting task.

Methods

A. **Subjects :** Twenty four chronic non-paranoid schizophrenics were tested. Each patient had a history of hospitalisation of three years or more and the clinical course of the illness was well documented. The following criteria were defined for each patient : age, sex, duration of illness, the absence of a coherent, systematised delusional state, the presence or absence of hallucinations in any modality, and the nature and dosage of any drug therapy over the previous six months.

There were twelve males and twelve females in the sample, mean age being 37 years. Ten patients admitted repeated recent hallucinatory experiences and their statements were confirmed by members of the nursing staff.

All patients tested had received varying doses of trifluorperazine (Stelazine) within the six months preceding the experiment.

B. **Measurement of Withdrawal :** Each patient was rated by his or her charge nurse on items 6, 7, 9, 10 from the scale devised by Venables (1957) and items 1 to 5 from the scale devised by Venables and O'Connor (1959). The same items used by Venables (1963) were adopted in order to maintain as close a similarity between the two studies as possible.

The small size of both the hallucinated group and the non-hallucinated group makes it hazardous to attribute the differences between them solely to the presence of hallucinations as other factors may have been operative; however the findings reported above serve to emphasise the importance of taking into account as many features of the clinical picture as possible in the selection of a sample of schizophrenics.

C. **Measurement of Breadth of Attention :** Each patient was asked to sort one of two packets of 36 cards each into two categories on the basis of the presence of either of two relevant letters set against a background of eight irrelevant letters. The relevant letters in each of the two packs were B and Z; the irrelevant letters in one pack were, as in Venables' (1963) experiment, C, G, J, L, Q, Z, Y, W, and D, F, H, K, R, T, V, X in the other.

Each subject was given five sorts on one of the two packs and then given one sort on the other pack. The degree of impairment of performance brought about by a change in the irrelevant background was taken as an index of the breadth of attention. Half the subjects were given one pack for their first sorts, the other half were given the other pack.

In order to determine whether results could be baised by differences in the speed of letter recognition secondary to differences in the degree of schooling received, data on the education level in years were obtained from the case notes and subjects were also given a similar card sorting task in which both the relevant and the irrelevant stimuli were coloured circles.

Results

The difference between the time taken to sort the second pack of cards and that

taken on the last sort of the first pack was taken as a measure of the degree of impairment caused by a change in the irrelevant background stimuli. It was assumed that the less the impairment caused by background, the narrower the span of attention.

This measure differs from that used by Venables (1963), who used the difference between the estimated time of a fifth sort on the first pack after four practice sorts and the measured time of the sort on the second pack; since the trends for the first sorts were not linear, and since it is unlikely that the degree, and indeed the direction, of change in the early stages of practice can be predicted with any accuracy, this measure could not be adopted.

From the scatter diagram *(Fig. 1)*, it can be seen that results for the whole group do not support the relationship between withdrawal and breadth of attention reported by Venables (1963).

It can be seen, however, that the relationship between the two variables for the hallucinated group tends to be in the opposite direction to that for the non-hallucinated group and both these relationships appear to be significant.

The correlation for the whole group was 0.051 (not signficant, $n = 24$). The correlation between the two variables in the hallucinated group was, however, 0.784 ($p < 0.01$, $n = 10$); the correlation in the non-hallucinated group was -0.634 ($p < 0.05$, $n = 14$).

The results obtained with the colour cards showed no significant relationship in any group and measures of attention span were not related to the education level in years.

Discussion

The results obtained by Venables (1963) could not be replicated in a

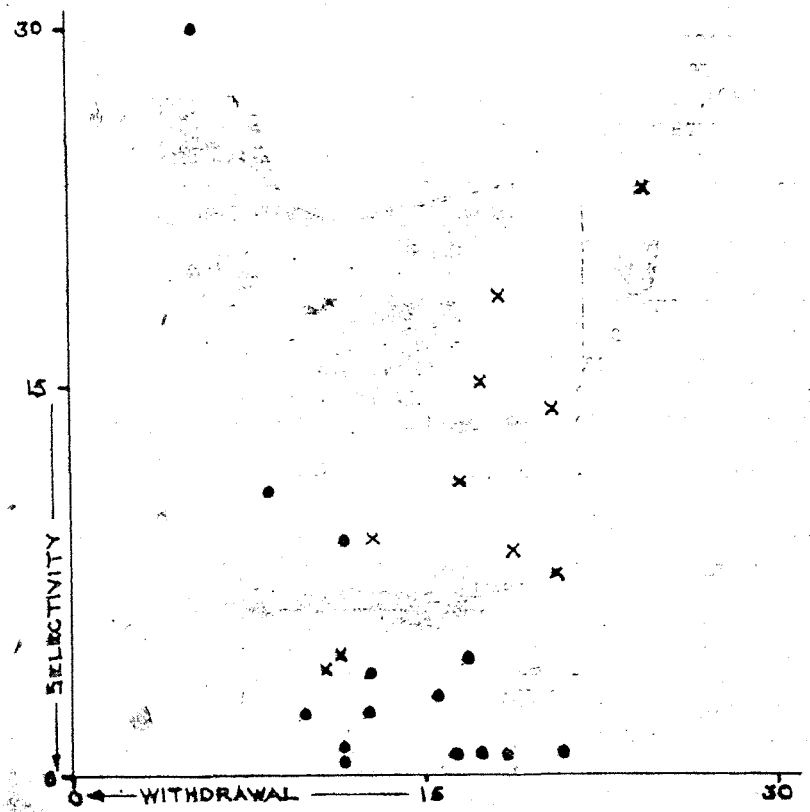

FIG. 1.

HALLUCINATED GROUP = X-X-X NON-HALLUCINATED GROUP = ●-●-●

similar, but not identical, experiment. The findings for the whole group do not provide evidence supporting a relationship between social withdrawal and the breadth of attention.

These findings suggest that more withdrawn patients show a decreased span of attention if they are subject to auditory or visual hallucinations, and that, in the absence of hallucinations, the opposite effect can be seen.

There is no record of any attempt at determining the qualitative and quantitative effects of hallucinations on the performance of chronic schizophrenics in choice reaction time tasks; there are many difficulties involved, the main one being that it is impossible to determine the time of occurrence, duration and extent of a hallucination with any accuracy, and it is equally difficult to ensure that a subject is actively hallucinating at the time of testing.

Venables (1963) interpreted his findings as providing some evidence against the concept of overinclusiveness in schizophrenics (Cameron, 1938), and suggested that the decreased distractibility seen in more withdrawn patients could be due to selective processes occurring at a cortical level.

It is not unlikely that selective proceses may be affected by the general level of 'noise' in the perceptual system, and that the effects of such 'noise' on levels of arousal would be related to its "arousal value". 'Internal sources of 'noise' have been described and one could speculate that hallucinations could act as 'internal sources of noise' with a high "arousal value".

It has in fact been suggested that hallucinated schizophrenics may differ from non-hallucinated schizophrenics in more than just momentary perceptual experiences (Forgus and Dewolfe, 1969).

The work reported was undertaken as a final year project in part fulfilment of the requirements for the Oxford B.A. in the Final Honours School of Psychology, Philosophy and Physiology, and was carried out at Mount Carmel Hospital, Attard, by kind permission of the Physician/Superintendent, Dr. J. Pullicino.

Thanks are due to the consultant staff at Mount Carmel Hospital for permission to test patients under their care, and to the nursing staff for their cooperation.

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