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MIC

THOUGHT DISORDER, FLATTENING OF AFFECT

AND

PERSONAL CONSTRUCTS

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SUMMARY

The investigations are reported in two parts.

Part I

Background: Dixon (1968) has demonstrated an abnormality in the content of the personal construct systems of some schizophrenic patients, clinically assessed as emotionally flattened. When discriminating between pictures of people, they make very little use of constructs descriptive of personality or emotional state. Non-flattened schizophrenics and normals use such constructs frequently. This finding has been confirmed by McPherson et al. (1969). In addition to this abnormality in the content of the construct systems of some schizophrenics, Bannister has demonstrated a disorder in the structure of the construct systems of schizophrenics with thought-process disorder.

Aims: The aims of the investigations were:

- (i) To explore the relationship between these two disorders. It was noted that Bannister's measure of thought-process disorder (the Bannister/Fransella test) uses constructs which are similar to those which, on Dixon's measure, are not used spontaneously, i.e. those referring to 'psychological' characteristics. It was predicted that those schizophrenics who failed to use psychological constructs spontaneously on Dixon's test would show significant disorder when required to use them on the Bannister/Fransella test. However, they would not be expected to show disorder when using other types of construct, e.g. 'physical' ones.
- (ii) To establish the relationship between performance on the Dixon measure and the following variables:
  - (a) vocabulary level;
  - (b) motor retardation measures;
  - (c) sub-categories of schizophrenia.



Method: 20 actively-ill schizophrenics were administered the following tests: Dixon's flattening of affect test; the standard Bannister/Fransella grid test for thought disorder; a modification of the Bannister/Fransella test with the same photographs but using constructs describing the physical features of the people, e.g. well-built, healthy, etc.; the Mill Hill Vocabulary (synonym selection); the Babcock Levy battery; G.A.T.B. Motor dexterity test; Wechsler digit symbol test; Symptom Sign Inventory, (S.S.I.).

Results:

- (i) Schizophrenics who failed to use psychological constructs spontaneously on Dixon's test (N = 8) showed significantly more disorder on the standard Bannister/Fransella test than did those schizophrenics who used these constructs normally (N = 12); but the groups did not differ on the modified test involving physical constructs.
- (ii) Failure to use psychological constructs spontaneously on Dixon's measure was:
- (a) not related to vocabulary level;
  - (b) related to motor retardation (as measured by the Babcock tests);
  - (c) associated with non-paranoid schizophrenia assessed clinically but not as assessed by the S.S.I.;
- not associated with either the integrated or non-integrated groups of schizophrenics;
- not associated with either the acute or chronic phase of the schizophrenic illness.

Part II

Background: Bannister & Salmon (1966) have shown that thought process disorder does not affect all areas of thinking equally; for example, the construct sub-system governing the construing of people is more disordered than that governing the construing of objects.

Aims: The aim of this experiment was to establish whether differences exist in the two sub-systems governing the construing of people - those descriptive of psychological characteristics and of physical

features. Schizophrenics whose use of psychological constructs is disordered might be expected to show significant improvement when changing to construing the same elements according to their physical features. Schizophrenics whose use of psychological constructs is not disordered, and normals, might be expected to show no such improvement.

Method: The data from the two versions of the Bannister/Fransella test was re-analysed and a group of 12 normals was also tested.

Results: The schizophrenics whose use of psychological constructs was disordered showed significantly greater improvement in their use of physical constructs than did the non-thought disordered schizophrenic and normal groups.

#### General Conclusion

There exists a deficiency in the construct system of some schizophrenics which inhibits them from using psychological constructs spontaneously; when forced to use them, they employ them in a meaningless way. This deficiency is not so marked when physical constructs are involved.

.....0.....

GENERAL INTRODUCTION

"..... the presence of a certain degree of flattening of affect (assuming its adequate definition and measurement) or of thought disorder or of the passivity phenomenon may each be a sufficient condition for the diagnosis of schizophrenia, at least in the absence of known toxicity." (Foulds, 1965).

A. Flattening of Affect1. Clinical Aspects(i) Definition

Flattening of affect, when clearly defined, is to be differentiated from incongruity of affect, a clinical sign also commonly associated with the diagnosis of schizophrenia. The latter involves an inappropriate response to a given stimulus, e.g. the schizophrenic patient who giggles when he hears of his mother's death. Flattening of affect itself may be described as an impaired capacity for emotional response. There is a reduced degree of emotion in a situation which would normally elicit it. To judge the presence or absence of affective flattening the clinician notes the patient's facial expression, his tone of voice and the content of his talk. The face is often empty and expressionless, the tone flat, and the content of the talk unemotional, (Harris & Metcalfe, 1956).

(ii) Clinical Significance

Bleuler, in 1911, was amongst the first to acknowledge and describe fully the significance of disturbed emotional responses in schizophrenia. He classed "disturbances of affectivity" as primary symptoms, along with "disturbances of association" (thought disorder) and autism (withdrawal). He postulated that a continuum of reduced emotional responsiveness existed, with the severest cases lacking any form of affective expression, whilst the less severe differed in the degree of intensity of emotion shown to

particular situations. Bleuler also stated that at no time during the course of a schizophrenic illness was there a complete loss of affect - "one can demonstrate the presence of affects in an individual who is apparently a mere vegetative organism".

Bleuler also made the very important observation that reduced emotional responsiveness often occurs in acute cases of schizophrenia, and that it is incorrect - although later researchers have ignored this fact - to equate chronicity with the degree of affective flattening; (e.g. Salzinger & Portnoy, 1964). He, too, pointed out the relationship between affective disturbance and prognosis - the presence of flattening of affect as a clinical diagnostic sign at the beginning of a schizophrenic illness being a poor prognostic sign, (Harris & Norris, 1954).

There has been little else added to our knowledge of schizophrenia since Bleuler's very accurate accounts (Freyhan, 1958). Mayer-Gross et al. (1954) have also commented on the idea of a continuum of emotional responsiveness, and the prognostic indications to be inferred from early onset of flattening of affect in the schizophrenic illness. They also make the interesting observation that when chronic schizophrenics have febrile infections they "show adequate emotions naturally expressed." In other words, flattening of affect may be a reversible deficit, in the same way as, e.g. intellectual deficit has been shown to be (Foulds & Dixon, 1962). Impairment was found to be more or less completed by the time of first admission, but acute cases showed powers of recovery, particularly catatonics.

Harris & Norris (1954) attempted to discover the prognostic significance of affective flattening by assessing

the outcome of illness in a group of schizophrenics whom Harris had interviewed ten years previously, noting at that time whether they showed shallow or inappropriate affect. A significant association was reported to exist between 'deteriorated mood' and poor outcome. However, as Dixon(1968) points out, inter-rater reliability was not investigated for either emotional deterioration categories or for outcome, and so it is difficult to assess the real significance of the conclusions Harris & Norris draw. Furthermore, the two parts of the study, presenting symptoms and outcome, might have been better done by independent judges.

(iii) Inter-Rater Reliability

As the clinical judgment of the presence of flattening appears to be so subjective - "interpretation of the patients' facial expression, their tone of voice and the content of their talk" - there would seem to be a likelihood of very poor inter-rater reliability. However, studies in this area all report satisfactory agreement between judges. Harris & Metcalfe (1956) asked three psychiatrists to interview jointly 23 schizophrenic patients and to rate them on a 3 point scale. There was complete agreement on 17 of the cases. However, repeating the experiment with three house physicians lacking clinical experience produced very little agreement. Wing (1961) also obtained high reliability, using a 5 point rating scale.

2. Experimental Studies of Flattening of Affect

There have been very few studies of flattening of affect as an entity; however, investigations into the influence of affective stimuli upon the behaviour of schizophrenics, and into the physiological bases of affective disorders may be of relevance to the understanding of affective flattening.

(i) Affective Stimuli

Buss & Lang (1965) discuss the problem of the definition

of "affective stimuli". The term has arisen from experiments in which censure stimuli (right/wrong) have been found to disturb schizophrenics in definite ways, and this disturbance has led to a deterioration in performance. "The meaning of 'affective stimuli' changes from one experiment to the next. It can have taboo aspects, as in the sexual stimuli used by Arey (1960); it may refer to human as opposed to non-human stimuli; it may be symbolic, as opposed to non-symbolic (Raush, 1956); or it may be defined empirically, by means of Luria free association indices (Feffer, 1961)." Buss & Lang approach the problem by regarding affective stimuli as "being better able to elicit associations from subjects". In this way all the meanings considered before may be grouped together in terms of their ability to set off a train of more personal and idiosyncratic associations than neutral stimuli would.

Using the above definition it may be argued that one of the larger sources of affective stimuli would be humans. They are the intermediate stimuli of several of the factors already quoted as disturbing the schizophrenic's performance; e.g. social censure, sexual taboos, etc. For this reason it could be hypothesised that human stimuli themselves would affect the schizophrenic's performance. For example, Davis & Harrington (1957) found that schizophrenics were worse at using information about human pictures than about non-human pictures. Marx (1962) found that human stimuli disrupted performance on a conceptual task more in his group of "early" (acute) schizophrenics than in the group of "late" (chronic) schizophrenics. Whiteman (1954) compared learnt formal concepts (based on physical properties) with social concepts (based on social interactions between people) and concluded that although schizophrenics were poorer than normals on non-human, formal concepts, their performance was significantly worsened on the human, social concepts. Finally, Brodsky (1961) found that schizophrenics were significantly less adequate in dealing with human stimuli than with non-human

stimuli only when compared with normals.

The general conclusion that may be drawn from these four experiments is that affective stimuli of an interpersonal nature seem to be particularly functional in interfering with the schizophrenic's performance on specific tests.

(ii) Physiological Bases

Physiologically, emotion has been investigated in terms of arousal level. Malmo, Shagass & Smith (1951) found that a group of 17 chronic schizophrenics showed a consistently high level of background physiological activity, compared with normals. Despite this high level of arousal they pressed a lever to indicate pain less often than did the normals. The conclusion is drawn that this is "counter to the traditional view that affect is 'flat' in schizophrenics." However, here chronicity is being equated with flattening of affect; this seems rather dubious in view of the observation of Bleuler (1911, see p.5) and the finding of Harris & Norris (1954) that flattening of affect is associated with the acute phase of schizophrenic illness. Again, these chronic schizophrenics would probably now be classified as "burnt-out" schizophrenics (Foulds et al. 1967), who demonstrate none of the active clinical signs of schizophrenia - including flattening of affect.

Venables & Wing (1962) confirmed the findings of Malmo et al., making the additional discovery that the more socially withdrawn the patient, the higher his level of arousal. They also record a high association between flattening of affect and withdrawal, so high arousal seems to be associated with flattening of affect. The conclusion to be drawn generally is that schizophrenics are more aroused than normals and there is some indication that high arousal may correlate with severe flattening of affect. However, it would seem important to investigate other details more closely here:

What is the correlation when 'burnt-out' schizophrenics are considered in comparison with a group of acute schizophrenics?

What are the effects of hospitalisation and drugs - both past and present ones - on the level of arousal shown by the schizophrenic?

(iii) Experimental Investigations of Affective Flattening

(a) Salzinger & Portnoy

More direct methods of investigating emotion have been employed by Salzinger & Portnoy (1964), who, having established a method of eliciting self-referred affect statements, found that reaction to reinforcement differentiated between those schizophrenics who left hospital within 6 months and those who did not. Those schizophrenics who conditioned relatively easily had a better prognosis. It was also found that there was a significant difference in the number of spontaneously emitted self-referred affect statements (e.g. 'I was sad') between acute and chronic schizophrenics, and it was concluded that: "chronic schizophrenics are characterised by a low rate of responding rather than flatness of affect." Again, chronicity is equated with flattening of affect; do 'flattened' schizophrenics tend to talk less, or do they use a smaller proportion of affect words?

(b) Harris & Metcalfe (1956)

These workers, in a study of schizophrenics, confirmed that a low rate of responding was characteristic of schizophrenics with flat affect. They applied intelligence tests as follows:

- (1) Sub-items of Wechsler Bellevue, namely vocabulary, similarities and block design.
- (2) Rampton Hospital Sorting test - where S has to sort cardboard pieces in different ways according to their colour, shape or decoration.
- (3) Nufferno speed test - stressed and unstressed versions of this test had previously been particularly applied in the field of functional psychosis (Furieux, 1953).
- (4) Recognition of Absurdities test - this involves a text containing several absurdities which schizophrenics had previously been noted to have difficulty in recognising.



(5) Wegrocki's tests consisting of:

- i. Sets of proverbs to be matched
- ii. Analogies in which the final word has to be replaced
- iii. List of objects in which one is clearly not related to the others

From this battery of tests Harris & Metcalfe differentiated between groups of schizophrenics showing no/moderate/gross flattening of affect. This difference, they say, is accounted for in terms of speed, not accuracy; i.e. schizophrenics with flat affect are slower at intellectual tasks than schizophrenics without flattened affect. However, as has been shown by Payne & Hewlett (1960), retarded depressives are equally slow, if not slower, on several tasks involving intellectual and motor abilities. Thus it would seem that there must be further differentiating factors.

(c) Dixon (1968)

Having noted that schizophrenics gave very few words descriptive of affective reactions to T.A.T. cards, Dixon decided to investigate this lack of response further. She was concerned with the content of the personal constructs (Kelly, 1955) which patients with affective flattening used when describing other people, and tested the hypothesis that affective flattening is associated with the relatively infrequent use of constructs descriptive of the emotional state or personality of other people. The method of eliciting constructs was for the subject (S) to be shown pairs of photographs depicting people, the pairs being selected so that there were a number of obvious differences between the people shown in the photographs, including some differences in the facial expression of emotion.

S was asked to describe all the differences between the people in the two photographs, and the replies were tape recorded. Five such pairs were administered. A series of constructs was thus elicited, i.e. descriptive terms which S used to differentiate

the people in the photographs.

Content analysis of the tapes was then carried out by independent judges to discover the content of the constructs which had been used. Twelve categories of construct were investigated, i.e. those having particular reference to the people in the pictures, namely:

Activity (A): reference to what the people in the pictures are doing.

Clothes (C): reference to anything the people in the pictures are wearing.

Emotion (E): reference to the feelings, emotions or personality of the people in the pictures.

Age (G): explicit reference to the age of the people in the pictures.

Nationality (N): reference to the country of origin or race of the people in the pictures.

Occupation (O): reference to the social, economic, occupational or religious status of the people in the pictures.

Physique (P): reference to the physical characteristics of the people in the pictures.

Stance (S): reference to the bodily pose of the people in the pictures.

Further categories dealing with the background and other details of the photographs were also noted:

Background (B): reference to anything in the pictures, other than the people or the clothes they are wearing.

Denial (D): indication that no (further) differences can be seen.

Irrelevance (I): intrusion of irrelevant material of a delusional or personal nature.

Photography (X): comment on the photography or the stimulus materials rather than the content of the pictures.

Dixon's experimental group consisted of 37 male schizophrenics drawn from acute and chronic wards. Two scorers who carried out the content analysis of the tapes showed a very

high degree of agreement on all categories. The results obtained from analysis of the content categories on the flattening of affect test of this group was compared with those of a control group consisting of 28 normal males. Half this group were convalescent patients in an orthopaedic ward, the other half were non-medical hospital staff. The object of using patients was to control for the factor of being in hospital at the time of the experiment.

The schizophrenics were assessed for the severity of flat affect by a psychiatrist and a psychologist. No definition of flat affect was given, and raters used different techniques of assessing the clinical sign. The psychiatrist asked the patient about his illness and his family, etc. whilst the psychologist worked mainly with questions from the Symptom Sign Inventory. Each rater then recorded the degree of flattening present in each patient by placing a mark on a continuum marked 'no flattening' at one end and 'very considerable flattening' at the other. The distance of the mark from the 'no flattening' end was measured and used to provide a rank ordering of subjects for each rater.

The agreement between the two raters was found to be highly significant ( $\tau = + 0.37$ ;  $p = .0007$ , 1-tailed test). In the subsequent calculations the mean of the ratings was taken as the criterion of the degree of flattening shown by each patient.

In this way Dixon confirmed that there was a negative relationship between severity of flat affect in the schizophrenic group and rate of verbal response. This indicated that differences in verbal fluency existed within the schizophrenic group, and that verbal fluency would have to be a controlled variable when considering the different category scores given by normal and schizophrenic groups. This correction for individual differences was made by dividing S's total category score by his individual content scores, thus obtaining a

proportional score for each content category.

Using this method of scoring the content analysis, Dixon found that schizophrenics have lower proportional scores in the affective category than normals ( $p < .01$ ). Three other categories occurring significantly less often are all 'human' ones, namely, age, occupation and physique. Conversely, the schizophrenic group significantly exceeded the normal group in their use of three 'non-human' categories, namely, background, denial and irrelevance.

Correlation of psychiatric rating and content category score in the schizophrenic group

<u>Category</u>	<u>Tau</u>		<u>Significance</u>
1. 'Activity'	- .15		Not significant
2. 'Background'	- .08		" "
3. 'Clothes'	+ .02		" "
4. 'Denial'	- .11		" "
5. 'Emotion'	+ .39	$z = 3.36$	$p = .0002$ (1 tailed test)
6. 'Age'	- .01		Not significant
7. 'Nationality'	- .15		" "
8. 'Occupation'	+ .03		" "
9. 'Physique'	+ .07		" "
10. 'Stance'	- .06		" "
11. 'Irrelevance'	- .19		" "
12. 'Photography'	+ .27	$z = 2.37$	$p = < .02$ (2 tailed test)

The primary hypothesis of Dixon's thesis was that within the schizophrenic group responsiveness to affective stimuli would be correlated with psychiatric assessment of flattened affect. As can be seen from the table, this correlation proved to be significant ( $p = .0002$ , 1-tailed test), indicating that the schizophrenic's use of affective content words is related to degree of emotional blunting, assessed clinically.

One other category, that of 'description of photograph', may also be seen to co-vary with the severity of emotional flattening ( $p = <.02$ , 2-tailed test). This is tentatively accounted for by the fact that this category includes evaluative statements, e.g. "not very good pictures", "quite a good photograph", and it is considered that a failure in the evaluation of the stimulus as good or bad is part of the schizophrenic's emotional flattening.

None of the other categories of construct correlated significantly with psychiatric assessment of clinical rating.

Dixon also found that besides differentiating between normals and schizophrenics, emotional content responses were the most frequently occurring and the most consistent category in the normal repertoire of responses. Normals responded to at least three or more of the five pairs of cards with affective verbal responses. Dixon therefore suggests that this would be a useful cut-off point in assigning schizophrenics to flattened or non-flattened groupings in further use of the test.

The experiment has been repeated on two occasions by McPherson et al. (1969). The first replication study involved 18 schizophrenics, with equal numbers of male & female, paranoid & non-paranoid subjects being represented. Two psychiatrists carried out clinical ratings, marking a line representing 'no flattening' at one end, and 'very considerable flattening' at the other. High inter-rater reliability was again found ( $\tau = + 0.44$ ,  $p <.005$ , 1-tailed test) and the mean of the ratings

was then used as the criterion of the amount of flattening shown by each subject.

The same set of photographs as Dixon used for her study was presented with the same instructions and the responses taped and content analysed. McPherson et al. confirmed Dixon's finding that subjects rated as showing most severe flattening of affect make significantly less use of constructs descriptive of emotion. The correlation obtained between clinical ratings and use of emotional category was  $\tau = -.47$  ( $p < .01$ , 2-tailed test).

A further replication study by McPherson et al. (1969) involved dividing 30 schizophrenics into two clinical groups, 15 with little or no flattening of affect, and 15 with moderate or severe flattening. These were matched in terms of age and I.Q. Again, use of emotional category descriptions was found to distinguish between the two groups ( $p < .02$ ; 2-tailed test), in that those schizophrenics with little or no flattening of affect used significantly more emotional constructs in their descriptions of the Dixon photographs. The category of 'background description' also distinguished significantly between the two groups ( $p = .05$ ); the severely flattened group tended to use more descriptions of background than did the other group. It would seem possible to hypothesise that severely flattened schizophrenics shy away from discussing the people in the photographs and concentrate more specifically on the background.

The conclusions reached from these three studies is that this test provides a specific stimulus situation for eliciting all types of constructs, including the most important group of affective constructs. The test has distinguished between schizophrenics with and without flattened affect by considering the content of the constructs they use to construe photographs of people. It shows that normals more frequently select emotional constructs to describe people, as do schizophrenics without severe flattening of affect. On the other hand, schizophrenics who have been clinically assessed as demonstrating marked emotional blunting use affective constructs relatively less often in their conceptualisation of people.

## B. Thought Disorder

The primary features of thought disorder when judged clinically from a schizophrenic's talk are (Bannister, 1960):

- (i) Inconsequential following of side issues.
- (ii) Tendencies for the thought to be directed by alliterations, analogies, clang associations, associations with accidents of the speaker's environment, symbolic meanings, and the condensation of several (perhaps mutually contradictory) ideas into one.
- (iii) Words used out of context, e.g. concrete meanings taken where abstract meanings would be appropriate.
- (iv) Clinging to unimportant detail.
- (v) The use of laconic answers, e.g. I don't know, maybe, perhaps - indicative of emptiness and vagueness of ideas.
- (vi) Thought is generally marked by gaps, poverty, indefiniteness and vagueness.
- (vii) Indications of thought-blocking.
- (viii) Indications of pressure of thoughts.

These all represent the form of thought process rather than the content of thought.

In 1960 Bannister produced a theory of thought disorder based on Kelly's Personal Construct theory. A person develops a system of constructs in order to categorise the situations he encounters during his life experience. This process is necessary for anticipating or predicting the events which will follow on the observation of the situation concerned. If the

prediction initially made is proved later to be invalidated, the individual tends to modify his construct system accordingly. The constructs are also assumed to be related hierarchically together, with core constructs giving rise to other related, but less important, side constructs.

Bannister has used this theory and terminology to explain the structure as opposed to the content of schizophrenic thought disorder. In his experiment of 1960 he showed that a group of thought disordered schizophrenics, as compared with normals, non-thought disordered schizophrenics, neurotics and depressives, had weaker construct relationships. He chose in particular measures of consistency of relationship between constructs (i.e. stability of constructs), and intensity of relationship, a measure taken to indicate the strength of conceptual structure. These two measures were particularly effective in differentiating thought disordered schizophrenics from the other experimental groups.

From this finding Bannister goes on to reiterate that changes made in construct systems are related to their validation history. If a person is construed as being at one end of the bipolar construct of 'loving' - 'hating' and then an invalidating experience occurs it would be expected that the position would shift to the opposite pole. If invalidation of this prediction also occurs, followed by several further invalidational experiences, the construct will become loosened to accommodate this movement and uncertainty. This will also weaken the construct's relationships with other constructs normally constellated around the core construct. Thus loosely construing a person as 'loving' does not necessarily also make him 'likeable' or 'sincere'.



Applying this theory to the features of thought disorder listed previously:

"Inconsequential following of side issues" - if the construct system has been loosened then its focusing and restricting effects are lost, and chance features occurring may lead the person off on a completely alien side-track.

"..... thought directed by alliterations, analogies, clang associations ....." - loosening of constructs allows for the loosening of meaning too, so talk is guided by other less meaningful cues.

"Clinging to unimportant detail" - once the hierarchical arrangement of the construct system is loosened, superordinate and subordinate relationships between constructs also change, causing some subordinate construct to appear far more important to the schizophrenic, who is clinging to it, and makes it into a superordinate construct.

"..... vagueness and poverty of ideas....." - these may again be related to the loss of meaning of constructs, and - reducing the symptom to word salads - may even result in words being used merely as sounds without meaning being conveyed at all.

"..... thought blocking and pressure of thoughts" - these are almost entirely dependent upon the speed of availability of constructs, and other related construct constellations. Once the links between these become loosened and indeterminate, the number of items in the network which may be called upon is reduced and thought blocking occurs as it becomes more and more difficult to track down an appropriate construct. Weakening of constructual links may also lead to a large number of equally related constructs all being available at once, resulting in rapid and inconsequential talk.

Bannister puts forward his operational definition of schizophrenic thought disorder as a "condition in which subjects on any sorting task produce weak sorting relationships. These sorting relationships show little stability when the subject moves from one group of elements (stimuli) to another and the pattern of sorting relationships is private and idiosyncratic, with the subject

manifesting little conscious awareness of the nature of such patterning as does remain."

Bannister and Fransella have devised a "more adequately standardised and economically based test for detecting thought disorder", (Bannister & Fransella, 1966). Performance on this, they claim, is not affected by extraneous variables of intelligence and sex. Age affects performance only in an organic brain damaged population, and for the purpose of this thesis will also be considered not to affect test performance results.

The task involved is primarily one of sorting eight photographs (elements) in terms of specific constructs of which one polar description is given, namely:

kind, selfish, stupid, sincere, mean and honest

In the construct system of the normal subject these constructs have been demonstrated to be related in definite ways, so that correlations of the rankings of pairs of constructs tend to be high positive or high negative. Thought process disordered schizophrenics have an abnormally loose arrangement of constructs, and their correlations tend towards zero. This gives rise to the intensity of relationships score.

The subject repeats the six rankings immediately after the first trial - this provides a measure of the consistency with which the constructs have been used. In subjects not showing thought process disorder this correlation is high; in thought process disordered schizophrenics it is low.

For the purpose of the test these scores are used in conjunction with each other, and, as measures of thought disorder, are found to differentiate significantly between groups of schizophrenics clinically diagnosed as thought process disordered, and other groups, clinically judged not to be thought process disordered.

A criticism of the validation studies of the grid test is made by Foulds et al. (1967). They point out that thought process disorder is better considered as a continuum, not as <sup>a</sup> present/absent

dichotomy, the method used in the validation studies.

They suggest a use of the continuum in their own validation study (Foulds et al., 1967), where each patient in their schizophrenic sample was assessed for thought disorder by his psychiatrist. The extent of the patient's disorder was indicated by a mark on a horizontal line, labelled at one end "No thought process disorder", and at the other "Very considerable thought process disorder". Each patient was then allotted a score indicating the amount of thought/disorder present in terms of the distance away (measured in millimetres) from the "No thought process disorder" mark. They found the Bannister/Fransella grid test valid in so far as consistency measures were concerned; intensity validity coefficients were in the same direction, but not significant.

Besides devising the grid test to assess thought disorder, Bannister has conducted experiments which attempt to investigate more closely the processes involved in thought disorder.

The serial invalidation hypothesis has been tested out on normals to see whether it is possible to produce a similar picture to that seen in the schizophrenic with thought process disorder. Several experiments (1963, 1965) have been carried out with the method, in general, being one in which normal subjects are asked to rank photographs in terms of certain constructs. Subjects are then given either validating or invalidating experiences in varying forms. In this way it has been shown that serial validation leads to a significant rise in the level of inter-correlation between constructs.

Serial invalidational results proved more difficult to explain, in that the inter-correlations fluctuated considerably during the experiment. However, there was a significant change in the pattern of construct relationships (i.e. reversals of relationships). It was also found that if constellations of the constructs being on the one hand validated and on the other invalidated, were related, interference tended to occur as far as the serial invalidation hypothesis was concerned.

Finally Bannister points out that this is only an experimental paradigm with thought disorder signs tending to appear in normals but not being nearly so severe as those seen in the schizophrenic illness.

Bannister & Salmon (1966) then went on to try to determine whether schizophrenic thought disorder is specific to certain areas of thought content or whether it will manifest itself in all diffuse thought. For example, will the schizophrenic be more confused when thinking about people than when he considers objects? It might be expected from the serial invalidation hypothesis that the area of maximum invalidation would be that of "thinking about people". This could well be true of both normals and schizophrenics.

However, in the case of schizophrenics various writers, e.g. Lidz, Bateson, Lyman Wynne, have postulated abnormal family relationships together with severe predictive invalidating experiences. They, too, from their more sociological viewpoint, have shown in a very similar fashion to that of Bannister, how thought disorder could be first induced and then perpetuated in a child being raised in one such family.

To investigate this hypothesis, that thought disordered schizophrenics would not differ significantly from normals in their degree of stability in construing photographs of people, Bannister & Salmon administered a "people" grid and an "object" grid to groups of 11 thought disordered schizophrenics and 12 normals. They found that their prediction was not borne out completely, in that the schizophrenic group showed thought disorder in both "object" and

"people" grids. However, the degree of thought confusion was not so great when dealing with objects as with people.

Bannister & Salmon conclude that content (i.e. the elements used in the sorting task) does play a very important part in the degree to which a schizophrenic demonstrates thought disorder.

One drawback to this conclusion is that, although the content of the test has been considered carefully as a variable, the constructs used in describing the elements have not been investigated. These, on their own, could equally well be responsible for producing thought process disorder signs in the schizophrenic.

### C. Vocabulary Level

Although Bannister & Fransella (1966) claim that intelligence is not a significant factor in the adequate completion of their test, Dixon (1968) suggests that a vocabulary test should be used in conjunction with the 'flattening of affect test'. She selected an arbitrary cut-off point of 15 on the synonym selection half of the Junior form of the Mill Hill Vocabulary Scale. Subjects scoring below this level were screened out during the selection procedure, as being unable to participate in the experiment.

In addition to this, Dixon correlated verbal ability as measured by the vocabulary test with the emotional content ratio, and she found that, for the schizophrenic group, the higher the score on the vocabulary test, the larger the proportion of emotional content. For the normal group this correlation was in the opposite direction, although it did not achieve an acceptable level of significance.

It should be noted that Harris & Metcalfe (1956) found no difference between their three groups of schizophrenics - 'grossly flat/moderately flat/no flatness' - on the Wechsler Vocabulary test. On the Mill Hill Vocabulary Scale Foulds & Dixon (1962) found that a small difference existed between schizophrenic and neurotic scores, but this was significant only for female schizophrenics.

### D. Motor Retardation

Babcock (1930) suggested that the schizophrenic illness and the deficits brought about by it could be explained in terms of slowness of response. Together with Levy (1940) she devised three tests to show this retardation.

Payne et al. (1960-67) investigated further the relation of retardation to other forms of thought disorder, using the three Babcock tests and the Wechsler Digit Symbol test as their measuring

instruments. Results have been inconclusive; e.g. Payne & Hewlett (1960) found that the tests of retardation failed to discriminate between the schizophrenic and depressive groups.

Harris & Metcalfe (1956,) in their study of the specific clinical sign of affective flattening, found a definite positive relationship between severity of affective flattening (rated clinically) and poor results on a series of psychological tests. From a close scrutiny of detailed test results they concluded that "patients with flat affect show a deterioration in mental speed", but they acknowledged that lack of speed alone may not be the responsible factor, but that the deterioration may arise from some more basic cause.

Foulds, Hope, McPherson & Mayo (1969) have more recently investigated:

- (i) the relationship of the Babcock tests to each other, and to a measure of mental speed (Digit Symbol test)
- (ii) relationship between measures of retardation and psychiatrists' rating of thought disorder
- (iii) the relationship between retardation and measures of over-inclusion and thought process disorder
- (iv) the relationship between retardation and acute versus chronic and paranoid versus non-paranoid sub-categories of schizophrenia.

From these investigations they concluded that 'speed tests' measure two different aspects of speed, the Babcock Levy battery tapping motor speed alone, whilst Digit Symbol taps psychomotor speed. They also advise that the use of time taken to write the patient's name should be excluded from the battery as it correlates poorly with the other two measures and clearly depends on the length of name as an extra variable. None of the other relationships investigated correlated together, indicating that speed scores do not play a particularly relevant role in the common clinical signs of schizophrenia.

### E. Sub-categories of schizophrenia

In the experimental study of the schizophrenic illness writers have found it useful to divide the group into sub-categories.

#### (i) Paranoid versus non-paranoid

This is perhaps the most common division, where the presence or absence of paranoid symptoms, i.e. delusions and hallucinations, determines the clinical picture, (Fish, 1962). Paranoid schizophrenia usually begins over the age of 25 years when the personality is well established. Gross deterioration of the personality is not common. The non-paranoid category contains the other three common groups, namely: hebephrenics, catatonics and simple schizophrenics, where clinical signs of thought process disorder, emotional flattening, incongruity of affect, etc. are more prevalent than delusions.

#### (ii) Integrated versus non-integrated

Foulds (1965) has put forward a suggested continuum of "increasing failure to maintain mutual personal relationships". This continuum ranges from normality through personality disorder, personal illness and integrated psychosis to non-integrated psychosis. Associated with this continuum are symptoms and signs which affect a person's position on this continuum.

Foulds claims that it is necessary for integrated psychotics to demonstrate clinical signs of perceptual disorder (e.g. hallucinations) and/or thought content disorder (e.g. delusions of grandiosity, persecution or guilt) and affective disorder (disproportionateness) and egocentricity. Non-integrated psychotics are also considered to possess these symptoms, but in addition show: loss of awareness of self as agent (passivity delusions), thought process disorder and affective disorder (incongruity and flattening).



(iii) Acute versus chronic

This classification has been found useful in considering schizophrenics in the light of various studies, e.g. Brown(1960). He found that the probability of discharge decreases sharply after 2 years from first admission to hospital. After this time it may be presumed that hospitalisation has had its own effect on the patient, additional to that of his illness.

A further category to be considered under this sub-heading is that of 'burnt-out' schizophrenia. Here there are no active signs of the illness, e.g. thought disorder or delusions, and the patient cannot be considered chronic.

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AIMS OF EXPERIMENT1. Flattening of Affect & Thought Disorder

In her thesis, Dixon (1968) discusses her results which show that schizophrenics, clinically rated as emotionally flattened, describe people seen in photographs using very few descriptions of personality or emotion. The general conclusion to be drawn from this is that flattened schizophrenics tend to conceptualise human stimuli in non-affective terms, whilst non-flattened schizophrenics and normals regularly use predominantly affective constructs in their description of people. In terms of Kelly's construct theory this would indicate that flattened schizophrenics more commonly select non-affective constructs from the system at their disposal, when describing events to do with people.

Reference is made too to Bannister & Salmon's (1966) experiment, in which they demonstrated that schizophrenics are more inconsistent in their use of constructs about people than in their use of constructs about objects. It is claimed that this inconsistency is a function of the nature of the elements (photographs of people or objects) used in the experiment. Dixon, on the other hand, puts forward the hypothesis that it is a function of the constructs supplied, with which to describe the elements, which causes the inconsistency. Since these constructs mainly involve assessment of personality, it could be argued that flattened schizophrenics, to whom they are not so readily available, are not able to conceptualise people in terms of kindness or honesty, etc. Had the schizophrenics been provided with purely physical constructs with which to describe people (fat/thin, tall/short, etc.) they might not have shown such a discrepancy in their consistency of judgement.

To generalise further, it could be hypothesised that emotionally flattened schizophrenics, when tested on the Bannister/Fransella Grid test for thought disorder, will, for the same reason, emerge as thought disordered in terms of the intensity of relationship and consistency scores.

The main aim of this experiment is to investigate more closely the relationship between the clinical signs of affective flattening and thought disorder, as measured by psychological tests.

## 2. Flattening of Affect and Vocabulary

Bannister (1966) has claimed that there is no relation between intellectual ability and performance on the grid test for thought disorder.

Dixon (1968) is more concerned with the effect of intellectual levels on her test, suggesting that the emotional category may require a higher level of verbal response than other categories. Her results could then be explicable in terms of flattened schizophrenics having lower verbal ability and therefore making comparatively few affective responses.

This explanation gains support from the results of Foulds & Dixon (1962). They found that hebephrenics achieved lower results on the Mill Hill Vocabulary and Raven's Progressive Matrices than did paranoids or catatonics. Longitudinal study revealed that, although remitted hebephrenics improved on their Progressive Matrices scores, their Vocabulary level did not rise to that of paranoid and catatonic subjects. This led to the conclusion that hebephrenics are initially duller, specifically in verbal ability.

Since a common clinical sign, usually present in the diagnosis of hebephrenia, is that of emotional blunting, the relation between emotional category scores and vocabulary scores will be checked.

## 3. Flattening of Affect and Motor Retardation

Harris & Metcalfe (1956) claimed that they found a relation between emotional flattening (rated clinically) and mental speed (as measured by psychological tests).

This conclusion is explored further in this thesis by considering three tests of speed and their relation to the emotional category scores obtained from Dixon's test.

## 4. Flattening of Affect and the Sub-categories of Schizophrenia

### (i) Paranoid versus non-paranoid

Many clinical writers, e.g. Fish (1962) have associated separate clinical signs with particular groupings within the schizophrenic illness. Thus Fish claims that affective

flattening is a feature of the non-paranoid group.

For this reason the relationship between the clinical grouping, i.e. paranoid or non-paranoid, and the degree of emotional flattening as measured by Dixon's test, will be investigated.

(ii) Integrated versus non-integrated

Foulds has claimed that affective flattening is a feature of non-integrated but not of integrated psychosis. It is one of the clinical signs which differentiates between the two groupings on the continuum. Emotional category scores on the Dixon test should also therefore distinguish between the groupings and correlate with scores obtained from the Symptom Sign Inventory.

The non-integrated ~~delusion~~ scale of the Symptom Sign Inventory will be investigated in terms of its relation with emotional category scores on Dixon's test.

(iii) Acute versus chronic

Researchers, e.g. Salzinger & Portnoy (1964) have regarded flattening of affect as a clinical feature occurring only in the chronic phase of the schizophrenic illness, and have therefore used only chronics in their investigations of emotional blunting. This assumption is regarded by many other clinicians as being rash, in that emotional blunting is frequently an important sign used in the diagnosis of an acute phase of schizophrenia.

The relation between the acute/chronic dichotomy (judged clinically) and emotional category scores will therefore be investigated.

Summary

The aims of the experiment are to investigate the clinical sign of flattening of affect and its correlation with measures of thought disorder, verbal ability, speed and sub-category divisions of schizophrenia.

METHODSubjects

These consisted of 20 patients, six female and 14 male, drawn from the admission wards of a mental hospital. In addition to a clinical diagnosis of schizophrenia (by the consultant in charge of the ward) the experimental subjects had to satisfy the following criteria: That they should:

1. be under 60 years of age
2. have no known brain damage
3. be not receiving E.C.T.
4. have a score of at least 6 correct items achieved on the synonym selection part of the Mill Hill Vocabulary (Junior Scale)
5. In addition, patients who subsequently obtained a score of less than 15 categories on the Dixon flattening of affect test were omitted from the analysis, in order to exclude those who were un-co-operative or who, for some other reason, were unable to complete the task.

Following the application of these criteria five experimental subjects were excluded from the total number of schizophrenics tested. Three patients (male) proved untestable, in that they walked out of the testing room after being presented with the first test. One patient (female) failed to complete all the tests in the battery, and another (male) was excluded because he did not achieve the required category score on the Dixon test.

Sub-diagnosis

Of the 20 subjects remaining 9 were diagnosed as paranoid and the remaining 11 as non-paranoid or unspecified.

Chronicity

This was measured from the time of first admission to a mental hospital or the first diagnosis of schizophrenia, whichever was the earlier. The term 'chronic' was applied to those schizophrenics who had been first admitted at least 2 years previous to the date of testing. In terms of this criterion, the group was composed of 8 acute and 12 chronic cases.

Mean Age

The mean age of the experimental group was 29.1 years (S.D. = 12.2). Included in the group was a boy of 14 yrs. who by the above criterion of chronicity was already judged to be a chronic schizophrenic. The age range was therefore 14 yrs. to 56 yrs.

Mill Hill Vocabulary

The mean score for this test was 26.9 (S.D. = 6.43).

Measuring Instruments1. Flattening of Affect test (Dixon, 1968)(i) Material and administration

The test material consists of five pairs of photographs depicting people as the main feature. The pairs were chosen so that there are clear contrasts or differences discernible between the people, e.g. in terms of their stance, physique, expressions of emotion.

The photographs are presented in pairs, the subject being asked to give all the differences he can see between the people on them. 3 minutes are allowed for each pair; the subject's responses are tape-recorded.

The responses thus elicited may then be analysed into the categories previously listed in the Introduction (p. 11) and examples of verbatim responses together with their categories may be seen below.

Activity (A)

"it's like cricket they're playing"

"looking down to another boy"

"giving the young baby a pick-a-back"

Clothes (C)

"it's a short-sleeved shirt"

"wearing a headscarf"

"one's got a watch"

Emotion (E)

"probably a sadist by nature"  
 "she is much happier"  
 "traces of worry on her forehead"  
 "does a lot of worrying"  
 "rather fearsome-looking"

Age (G)

"he's just over seventy"  
 "roughly the same age"  
 "they're slightly older"

Nationality (N)

"white coloured father and son"  
 "rather like a negro"  
 "the people have white skins"

Occupation (O)

"peasant lady"  
 "could be a pioneer somewhere"  
 "a smoker"  
 "one's poor-looking"

Physique (P)

"he hasn't got any teeth"  
 "the boy looks completely tired out"  
 "bush eyebrows and closely cropped hair"  
 "his ears protrude more"

Stance (S)

"sitting down"  
 "she's folding her arms"  
 "he has his left hand up to the wood"

Background (B)

"background is rather derelict"  
 "outside a shop"  
 "snow on the ground"  
 "loaf of bread"

Denial (D)

"that's about all I can see really."

"there's not much difference."

Irrelevance (I)

"I'm very conscious of the noise."

"How did you know I was in this morning?"

"I have to put my knitting down sometimes."

"We haven't got our worries to seek."

Photography (X)

"the photograph has been taken of him"

"photograph is not quite so clear"

"these two have been snapped"

"one's taken outside"

"one's very glazed; the other isn't"

(ii) Scoring Procedure

It was noted whether or not each category (previously listed on p.11) was used for each pair of photographs. Only first category responses were used and these were totalled to give the 'raw category score'. This score has a range of 0 - 5.

This score could also be converted to a percentage - 'percentage category score'. This gave an indication of the relative use of each category. This is important because the total output of responses from each subject might differ.

Further aspects of the scoring procedure are considered in the Appendix.

(iii) Cut-off points

For the purpose of future identification and analysis of results it should be noted that a cut-off point of 3 emotional responses is observed in the raw category scoring procedure. Dixon (1968) found that, whereas all normals and non-flattened schizophrenics used 4 or 5 emotional responses, flattened schizophrenics used 3 and under. Thus when the group is referred to as flattened schizophrenics they may be assumed to have scored up to 3



emotional responses on the Dixon test, whilst the non-flattened group have scores of 4 or 5.

Similarly, when considering percentage category scores a cut-off point of 10% is observed. These schizophrenics scoring 10% and under are termed 'flattened'; those scoring above 10%, 'non-flattened'.

## 2. Bannister-Fransella Grid Test of Schizophrenic Thought Disorder

### (i) Personality construct version

The test materials used were the standard eight photographs of people, four men and four women.

The method of administration was exactly the same as that advised by the Manual, with the subject rank ordering the photographs in terms of the constructs kind, stupid, selfish, sincere, mean and honest.

The intensity of relationship between the constructs, together with the consistency between the two grids, was calculated for each subject. The intensity of relationship score is calculated from the squared differences between the rank orders as applied to each construct. This gives a total of 16 comparisons. Relationship scores are then allotted, a high negative or positive score indicating that thought disorder is relatively less likely to be present. The total intensity of relationship scores is the sum intensity of relationship scores of both grids. The consistency score involves calculating the degree of agreement between the grids. The Spearman rho coefficient thus obtained indicates the extent of thought disorder - a high score indicating the relative absence of thought disorder.

### (ii) Physical construct version

For this test, which uses the same eight photographs as in the standard form of the grid test, a new set of constructs was devised. These were all descriptions of physical characteristics. Six constructs were selected which had an overall mean intensity and consistency score and variances similar in a normal population to those of the Bannister/Fransella personality version.

The six constructs finally employed were: healthy, physically weak, slow-moving, well-built, elderly and energetic. Of these three may be considered as generally favourable and three as unfavourable.

Exactly the same procedure was employed, with the subject being asked to rank order the eight photographs in terms of the six physical constructs.

### 3. Retardation measures

These consisted of:

#### (i) The Babcock Levy battery

It was decided, in accordance with Foulds' advice (1969) to omit the patient's name from the battery, as uncontrolled variables are the length of the name, together with the person's characteristic writing style. Furthermore, this measure of speed does not correlate significantly with the other two measures, namely:-

'I hope to leave very soon'

'United States of America'

These were presented printed on a card and also verbally, and the sum of the time taken to write them was noted.

#### (ii) General Aptitude Test Battery (G.A.T.B.) Motor Speed test

The score given was the number of cells filled in 60 seconds, after two practice runs.

#### (iii) Wechsler Digit Symbol test

Instructions were the same as those used in the Wechsler Adult Intelligence Scale and the subject was given 90 seconds before being told to stop. The score noted was the number of digits correctly coded in that time.

#### (iv) Mill Hill Vocabulary

The junior section of the synonym selection was administered. The task involves recognition alone and is not timed.

#### (v) Symptom Sign Inventory (Foulds, 1965).

This inventory, comprising 80 items, is administered by the clinician in the form of an interview. Some of the questions

involved have been proved to be specific to definite psychiatric syndromes, and as such, the inventory may be used as a diagnostic aid.

The whole inventory was administered to each subject, although only items relevant to the paranoid/non-paranoid, and the integrated/non-integrated scales, were used in the analysis.

### Procedure

The battery of tests was divided into two sessions, each one taking on average 1 hour. These sessions were held within the space of 4 days at the outside, the customary time elapsing being only 24 hours.

### Session I

The subject was seated at a table, and every effort was made to ensure his co-operation.

(i) Mill Hill Vocabulary Synonym selection (Junior scale)

(ii) Flattening of Affect test

The subject was asked whether he objected to having his voice tape-recorded. Two (both paranoid) did. One insisted that he required individual attention, and that this could only be achieved through my writing his replies down. The other claimed that the microphone made her nervous, so she was eventually persuaded to proceed, provided all recording apparatus was hidden under the table.

The following instructions were given:

"I am going to show you some pairs of photographs, and I want you to tell me all the differences you can see between the people in the two pictures. I will show you each pair for about three minutes, which should give you plenty of time to describe all the differences you can see."

The two stimulus cards were then placed face-up in front of the subject and the instruction given - "Here is the first pair of pictures; tell me all the differences you can see between the people in the pictures." The last part of this instruction was repeated with the presentation of each new pair of stimulus cards. The subject's responses to the five pairs of photographs were tape-recorded.

(iii) Bannister/Fransella grid test

The 8 photographs were laid out in random order in front of the subject. It was found necessary to assure the schizophrenics that none of the people shown in the photographs were known either by the experimenter or by the subject himself. They were also told that the test was entirely one of personal judgment and that there were no right or wrong answers.

The test was then started by asking the subject which of the people in the photographs was most likely to be kind. The photograph selected was turned over, its number noted by the experimenter, and the procedure repeated until all eight cards had been turned over. Five other rankings were made in terms of the constructs: stupid, selfish, sincere, mean and honest.

Difficulty was encountered, particularly with the female schizophrenics, in that they refused to use stupid, selfish and mean in their description of other people. If this proved insurmountable they were encouraged to give the opposite polar meaning of the construct and to rank the cards in terms of this pole. This was noted carefully with respect to the analysis of scores. In repeating the rankings, to obtain the consistency measurement, it was stressed that the experimenter was <sup>not</sup> wishing to test the subject's memory by asking him to do this.

(iv) Retardation measures

The three tests involved have already been described.

Four subjects failed to complete this section because of their poor eyesight which interfered to too great an extent to allow of adequate performance.

Session II(i) Physical construct version of thought disorder grid

The instructions were the same as those in the standard manual for the Bannister/Fransella grid test. This time it was stressed that all the judgments were to be of physical features only.

It should again be emphasised that the two versions of the grid test were randomly interchanged between sessions to ensure that there was no practice effect affecting the performance.

(ii) Symptom Sign Inventory

This was administered in its entire form as set down by Foulds (1965).

Statistical Analysis of Results

The following statistics were then applied to the results.

For Hypothesis 1

(a) Intensity and (b) Consistency scores of the flattened and non-flattened groups of schizophrenics on the personality construct version of the Bannister/Fransella test were compared, using the Mann-Whitney U test (Siegel, 1956).

For Hypothesis 2

(a) Intensity and (b) Consistency scores of the two groups of schizophrenics on the physical construct version of the Bannister/Fransella test were compared using the Mann-Whitney U test.

For Hypothesis 3

Mill Hill vocabulary scores were correlated with emotion category percentage scores using the Spearman rank correlation (Siegel, 1956)

For Hypothesis 4

Emotion category percentage scores and

- (a) Babcock speed scores
- (b) Wechsler digit symbol scores
- (c) G.A.T.B. motor dexterity scores

were correlated using the Spearman rank correlation.

For Hypothesis 5

Part A (i): Emotion category raw scores of the two groups of schizophrenics, clinically assessed as paranoid or non-paranoid, were compared using the Mann-Whitney U test.

Part A (ii): Emotion category raw scores of the two groups, assessed by the S.S.I to be paranoid or non-paranoid, were compared using the Mann-Whitney U test.

Part B Emotion category raw scores of the acute and chronic groups of schizophrenics were compared, using the Mann-Whitney U test.

For Hypothesis 6

Emotion category raw scores of the two groups of schizophrenics, assessed as integrated or non-integrated by the S.S.I., were compared, using the Mann-Whitney U test.

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HYPOTHESES

On the basis of the above discussion the following hypotheses were formulated:

1. That those schizophrenics who score 3 or less on the Dixon test (i.e. who use an 'emotion and personality' category of construct when describing 3 or fewer of the five pairs of photographs) will have significantly lower intensity of relationship and consistency scores on the personality version of the Bannister/Fransella grid test for thought disorder than will those schizophrenics who score 4 or 5 on the Dixon test.
2. That there will not be a significant difference between the two schizophrenic groups scoring 3 and under, or 4 and 5 on the modified version of the Bannister/Fransella grid test involving physical constructs.
3. That there will not be a significant correlation between Mill Hill Vocabulary scores and the use of emotion and personality constructs on the Dixon test (hereafter called E scores).
4. That there will not be a significant correlation between:
  - (a) E scores and the time in seconds taken to complete the Babcock tests
  - (b) E scores and the number of digits correctly completed in 90 secs. on the Wechsler digit symbol test
  - (c) E scores and the number of cells filled in 60 secs. on the G.A.T.B. motor dexterity test.
5. A. That paranoid schizophrenics (as assessed
  - i. clinically
  - ii. by the S.S.I.)
 will have significantly higher E scores than non-paranoids (similarly assessed).
  - B. That acute schizophrenics will have significantly higher E scores than chronic schizophrenics.
6. That those schizophrenics assessed as 'non-integrated' by the S.S.I. will have significantly lower E scores than will those assessed as 'integrated'.

RESULTSHypothesis 1

The results supported this hypothesis. Table 1 shows the mean intensity and consistency scores of the two groups, i.e. those using 'emotion and personality' constructs to 3 or fewer of the pairs of photographs (i.e. E scores of 0 - 3) and those using the constructs to 4 or all 5 of the pairs (i.e. E scores of 4-5).

Table 1 Mean Bannister/Fransella intensity and consistency scores of schizophrenic patients with Dixon test E scores of 3 and under; and 4 and over

	<u>E score</u>		<u>U*</u>	<u>p**</u>
	<u>0 - 3</u>	<u>4 - 5</u>		
N	12	8		
Bannister/Fransella Intensity (mean)	637	1274	13	<.01
Bannister/Fransella Consistency (mean)	0.24	0.72	11	<.01

\* Mann-Whitney test

\*\* two-tailed values of p shown

The Mann-Whitney test showed that, with both measures, the two groups differed significantly. In each case those patients using 3 or fewer emotional constructs had the lower, i.e. more thought-disordered, scores on the Bannister/Fransella test.

A similar result was obtained when a different cut-off point was used. This was based not on the number of times 'emotion and personality' constructs were used, but on the relative use (i.e. percentage use) made of these constructs as opposed to the other categories of construct. With 10 patients 'emotion and personality' constructs comprised 10% or less of all constructs used. The mean intensity and consistency scores of this group, and of the other 10 patients, are shown in Table 2.



Table 2 Mean Bannister/Fransella intensity and consistency scores of schizophrenic patients with Dixon test E% scores of 10% and under; and over 10%

	N	<u>E% scores</u>		<u>U</u>	<u>p</u>
		<u>10% and under</u>	<u>Over 10%</u>		
Bannister/Fransella intensity (mean)		10	10	30	N.S.
" " consistency (mean)		.27	.59	23.5	<.05

Again, those patients who made less use of emotion and personality constructs had the lower, i.e. more thought-disordered, scores - although the difference is significant only with consistency.

### Hypothesis 2

The results supported this hypothesis. Table 3 shows the mean intensity and consistency scores on the modified, physical construct, version of the Bannister/Fransella test, of the two groups, i.e. 12 patients with E scores of 0 - 3 and 8 patients with E scores of 4 - 5.

Table 3 Mean Bannister/Fransella (modified - physical construct - version) intensity and consistency scores of schizophrenic patients with Dixon test E scores of 3 and under; and 4 and over

	N	<u>E score</u>		<u>U</u>	<u>p</u>
		<u>0 - 3</u>	<u>4 - 5</u>		
Intensity (mean)		12	8	31	N.S.
Consistency (mean)		.49	.47	49	N.S.

The Mann-Whitney test showed that neither of the measures differentiated significantly between the two groups. Thus on a modified version of the Bannister/Fransella involving physical constructs, both groups achieved similar intensity and consistency scores.

Similar results were obtained, as may be seen from Table 4, when the groups were divided on the basis of the E% cut-off point of 10%.

Table 4 Mean Bannister/Fransella (modified-physical construct-version) intensity and consistency scores of schizophrenic patients with Dixon test E% scores of 10% and under; and over 10%

N	<u>E score</u>		<u>U</u>	<u>p</u>
	<u>10% &amp; under</u>	<u>Over 10%</u>		
Intensity (mean)	733	890	36	N.S.
Consistency (mean)	.47	.53	45	N.S.

### Hypothesis 3

The results supported this hypothesis. There was no significant correlation between the percentage of emotional and personality constructs (i.e. E% scores) given to the Dixon test and scores on the Mill Hill Vocabulary scale.

(Spearman rho = +0.12, N.S.)

The patients' use of emotional and personality constructs is thus not significantly related to vocabulary level.

### Hypothesis 4

As may be seen from Table 5 this hypothesis was not supported by the results.

Table 5 Correlations (Spearman rho coefficient) between E% scores on Dixon test and motor retardation measures

	<u>rho</u>	<u>p</u>
(a) Babcock tests	+ .49 *	<.05 (i-tailed test)
(b) W.A.I.S. digit symbol test	+ .29	N.S.
(c) G.A.T.B. motor dexterity test	+ .33	N.S.

\* The sign of this correlation has been changed, so that in all three cases positive correlations indicate that the slower schizo/phrenics have lower E scores.

The significant correlation between the Babcock tests and E% scores on the Dixon test indicates that flattening of affect is associated with motor retardation. Those schizophrenic patients who achieved low E% scores on the Dixon test took significantly longer to write the two Babcock sentences. The other two measures of motor retardation did not correlate significantly with E% scores, but trends were in the same direction.

The results therefore do not support Hypothesis 4, but instead suggest that affective flattening, as measured by Dixon's test, is associated with motor, and perhaps also psycho-motor, slowness.

### Hypothesis 5

#### Part A (i)

The results supported this part of the hypothesis. Table 6 shows the mean E scores (i.e. use of emotional and personality constructs) on the Dixon test for the two groups of schizophrenic patients assessed clinically as paranoid or non-paranoid.

Table 6      Mean Dixon test E scores of 2 groups of schizophrenic patients, clinically assessed paranoid or non-paranoid

	<u>Paranoid</u>	<u>Non-paranoid</u>	<u>U</u>	<u>p</u>
N	9	11		
Mean E scores	4.22	2.36	13	<.02

The Mann-Whitney test showed that the two groups differed significantly. Schizophrenic patients clinically assessed as paranoid use emotional and personality constructs significantly more often than do those clinically assessed as non-paranoid.

#### Part A (ii)

The results did not support this part of the hypothesis. Table 7 shows the mean E scores on the Dixon test of the two groups of schizophrenic patients assessed by the S.S.I. to be either paranoid or non-paranoid. For men, scores of - 1 and below were considered paranoid; 0 and above, non-paranoid. For women, scores of - 2 and below were considered paranoid; - 1 and above, non-paranoid. For further details of scoring, see the S.S.I. Manual (1968).

Table 7 Mean Dixon test E scores of 2 groups of schizophrenic patients, assessed paranoid or non-paranoid by the S.S.I.

	<u>Paranoid</u>	<u>Non-paranoid</u>	<u>U</u>	<u>p</u>
N	7	13		
Mean E scores	3.71	2.92	33	N.S.

The Mann-Whitney test failed to differentiate significantly between the two groups assessed as paranoid or non-paranoid on the S.S.I.

#### Part B

This hypothesis was not supported by the results. Table 8 shows the mean E scores of the 8 'acutes', i.e. those whose first admission to hospital or first diagnosis of schizophrenia had occurred 2 years or less previously, and of the 12 'chronics'.

Table 8 Mean Dixon test E scores of 2 groups of schizophrenic patients, 'acute' or 'chronic'

	<u>Acute</u>	<u>Chronic</u>	<u>U</u>	<u>p</u>
N	8	12		
Mean E scores	3.13	3.25	46	N.S.

There was no significant difference between the groups. The production of emotional and personality constructs is therefore not associated with the acute versus chronic dichotomy in schizophrenia.

#### Hypothesis 6

This hypothesis was not supported by the results. Table 9 shows the mean E scores of the 'integrated' and 'non-integrated' schizophrenics. Scores of 1 and below were considered 'integrated'; scores of 2 and above, 'non-integrated'. For further scoring details see Foulds 1965.

Table 9 Mean Dixon test E scores of non-integrated and integrated schizophrenics, as assessed on the S.S.I.

	<u>Integrated</u>	<u>Non-integrated</u>	<u>U</u>	<u>p</u>
N	6	14		
Mean E scores	2.83	3.36	31½	N.S.

The Mann-Whitney test failed to distinguish between the groups. Those schizophrenics assessed as 'non-integrated' by the S.S.I. did not have significantly lower E scores on the Dixon test.

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DISCUSSION1. Flattening of Affect and Thought Disorder

The results show that there is a statistically significant relationship between the two disorders measured by the Bannister/Fransella grid test of thought disorder and the test devised by Dixon to measure flattening of affect.

These disorders seem to be associated with the faulty personal construct system of the schizophrenic. A low score on the Dixon test indicates a failure to use emotion and personality constructs when describing people. McPherson et al. (1969) have shown that this failure is associated with clinically observed behaviour called by the clinicians 'flattening of affect'. The observation of this clinical sign is a function of the schizophrenic's behaviour during a clinical interview, where it is noted that he produces emotion constructs spontaneously, but without the accompanying facial expression of emotion. When he is required to use emotional and personality constructs, such as 'kind', 'mean', etc. in the Bannister/Fransella test, the result is thought disorder. Schizophrenics who do not produce emotion and personality constructs spontaneously in an interview situation or in responding to the photographs of the Dixon test are unable to use these constructs when they are required to. Their personal construct systems which involve the evaluation of emotion and personality cues break down, resulting in a loosening up of links between related construct systems and inconsistency of thought processes.

The results also indicate that there is no significant relationship between the disorder measured by the Dixon test and that measured by a modified version of the Bannister/Fransella test involving physical constructs. Thus, those schizophrenics who obtain low scores on the Dixon test, together with 'thought process disordered' scores on the emotion and personality version of the Bannister/Fransella test, do not show the same degree of thought disorder on the physical construct version of the Bannister/Fransella test.

It would therefore seem that underlying the clinical signs of flattening of affect and thought disorder there is a more basic disorder involving the lack of a functional construct system to deal with situations involving evaluation of emotion and personality cues. This basic disorder affects the schizophrenics' performance on the Dixon test and they appear 'flattened' in that they do not use emotion and personality constructs spontaneously. The disorder also affects their performance on the Bannister/~~Fransella~~ test, because the constructs they are forced to use are therefore meaningless to them and they can use them only loosely and inconsistently.

On the other hand, this basic disorder in their personal construct system in no way affects the evaluation of physical cues and these constructs can therefore be used normally.

A more direct test of this hypothesis is made in Part II, and further implications of the results will be discussed.

## 2. Flattening of Affect and Vocabulary

The results indicate that there is no significant relationship between the disorder measured by the Dixon test and the verbal ability measured by the synonym section of the Mill Hill Vocabulary scale. It therefore seems clear that the 'flattening of affect' assessed by the test is not a function of the verbal ability of the schizophrenic to produce affective responses.

Emotional flattening is a clinical sign often associated with the diagnosis of hebephrenia. Foulds and Dixon (1962) found that hebephrenics achieved lower results on the Mill Hill Vocabulary test than did paranoids or catatonics. From the results given in this thesis it would seem that verbal ability and flattening of affect should be **considered as separate entities in diagnosis.**

However, the task involved in the Mill/<sup>Hill</sup>Vocabulary synonym selection is one of recognition alone, and before concluding finally that verbal ability has no effect on the number of emotion category descriptions given to the Dixon photographs, it would be necessary to administer the definition part of the Mill Hill Vocabulary as well. The abilities

involved in this part would seem to bear more relation to those involved in the production of spontaneous verbal responses to the Dixon test.

### 3. Flattening of Affect and Motor Retardation

The results indicated that there was a significant correlation between flattening of affect as measured by the Dixon test and motor slowness as measured by Babcock's tests. With another test of motor speed the correlation was not significant, but was in the same direction. A test of psychomotor speed also showed this trend, but to a lesser degree.

It would therefore seem that motor retardation is a factor to be considered together with flattening of affect. In view of other results indicating that flattening of affect is also associated with thought disorder it would seem more plausible to suggest that the three disorders are related, but not causally. Thus Babcock's hypothesis that slowness of response was the underlying factor of the schizophrenic illness and the deficits brought about by it might seem a little over-simplified in the light of later research concerning personal construct systems and thought disorder (i.e. the work of Bannister et al.). It might be suggested, however, that those schizophrenics who are disordered in their personal construct systems involving emotion and personality categories and have difficulty in producing them spontaneously, will tend accordingly to be confused and rather less efficient in other tasks that they have to perform. There was no evidence that the 'flattened' schizophrenics were on more drugs than those who were not flattened. In addition, it is difficult to see how medication is connected with the production of emotional constructs, although it may make the schizophrenic patient slower in mental and motor tasks.



#### 4. Flattening of Affect and Sub-Categories of Schizophrenia

##### Paranoid v. non-paranoid (assessed clinically)

The results indicate that there is a significant relationship between flattening of affect, assessed by the Dixon test, and the non-paranoid category of schizophrenia, as assessed by clinical interview.

Previous results obtained by McPherson et al. have indicated that Dixon test scores correlate significantly better with (clinical) rating of flattening of affect than do clinical ratings correlated together, (i.e. inter-rater reliability). From these two results it may be concluded that flattening of affect, measured either subjectively in clinical interview or more objectively by the Dixon test, is a common clinical sign which is significantly associated with non-paranoid schizophrenia. It further seems clear that the Dixon test measures or uncovers the basic disorder concerned with the clinical sign of flattening of affect whilst the clinician's interview taps only the surface result of this basic disorder. In the interview the clinician leads the subject into the situation where he has to discuss emotional topics. In this situation the schizophrenic demonstrating the clinical sign of flattening of affect may produce constructs involving emotion or personality, without registering any other of the concomitants of emotion. On the other hand the paranoid schizophrenic will retain his construct systems involving emotion and will use them correctly and consistently to elaborate on his symptoms. The Dixon test distinguishes between the two groups because again the paranoid schizophrenic is able to employ emotion and personality constructs. The non-paranoid schizophrenic uses fewer or none of these constructs because they are meaningless to him, and, unlike in the clinical situation, he is allowed to ignore them.

##### Paranoid v. non-paranoid (assessed by S.S.I.)

Statistics comparing Dixon test scores with the Paranoid/non-paranoid sub-classifications in the S.S.I. failed to distinguish between the groups. This would seem to contra-indicate the previous finding that a schizophrenic with a low score on the Dixon test has a significantly

greater possibility of being sub-classified as non-paranoid.

Of the twenty schizophrenics to whom the S.S.I. was administered two did not acknowledge any of the items as having any relevance to their illness. A further three did not acknowledge any of the relevant items on the paranoid/non-paranoid scale. It was felt that these five patients should be included in the statistics and they were placed in the group with all the schizophrenics who did not obtain a score allocating them to the paranoid group. However, this is clearly an unsatisfactory arrangement and goes a long way towards explaining the seemingly anomalous result.

It is difficult to postulate how this situation could be avoided in further assessment. The S.S.I. is administered not as a check list but as an inventory, the items of which are discussed with the patient to clarify that he understands and is answering correctly the specific subject involved. He is encouraged to talk spontaneously around the item and help is given if he has difficulty in understanding the meaning of the item. This often involves paraphrasing the question, an action of rather dubious reliability. If a patient has erected such defences that he denies all or most of the items it would seem that the S.S.I. is of little relevance, either for research or diagnostic purposes.

#### Integrated v. non-Integrated

Results failed to show any statistical relationship between flattening of affect, as measured by the Dixon test and the non-integrated group of schizophrenics, assessed by the S.S.I.

The same discussion applies to this section as to the previous section on using the inventory to distinguish between paranoid and non-paranoid groups.

#### Acute v. chronic

Results showed that flattening of affect, as measured by the Dixon test, was not significantly associated with either the acute or chronic phase of the schizophrenic illness. From this it may be



inferred that there were several schizophrenics having low scores on the Dixon test in both acute and chronic sub-categories. It is therefore clear that researchers, e.g. Salzinger and Portnoy (1964), by taking only chronic schizophrenics as their subjects in their research into flattening of affect are losing considerable material by ignoring the acute group of schizophrenics. Neither is the assumption that all chronics are emotionally flattened tenable. There is also the possibility mentioned previously, that in a group of chronic schizophrenics there may be several 'burnt out' cases where there is no active clinical sign of emotional flattening, but the schizophrenic in appearing passive and apathetic may be erroneously judged flattened.

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PART II

PART IIINTRODUCTION

As was discussed in the main Introduction, Bannister has investigated schizophrenic thought disorder in terms of Kelly's Personal Construct theory. He has postulated that thought disorder is directly related to the schizophrenic's construct system which causes constructs to be used loosely and inconsistently. Bannister and Salmon (1966) have further demonstrated that thought disorder does not affect all construct systems equally, in that a group of schizophrenics showed more evidence of thought disorder in dealing with people than in dealing with objects.

It is postulated that construct systems are built up by validating experiences. The thought disordered schizophrenic is more sensitive to, or receives a relatively larger number of, conflicting validation experiences, which causes him to form loosely related construct systems.

It could be suggested then, that those construct systems involving concepts of emotion or personality traits may be more difficult to validate than those involving purely physical objects. The judging of the latter is a far more objective performance, less prone to invalidation, whilst emotion construct systems depend more on the interpretation of subjective cues of a more inter-personal nature.

Foulds has suggested that mental illness involves withdrawal from inter-personal relationships to varying extents, and it would seem that a factor of the schizophrenic illness could be that thought disorder occurs earlier and therefore to a greater extent in the area of emotional construct systems. Thus a schizophrenic who finds difficulty in dealing with emotional constructs may well appear more thought disordered on the Bannister/Fransella grid test involving emotional and personality constructs than he will on a similar test involving physical constructs.

This section will investigate this hypothesis more closely; i.e. do schizophrenic patients who are assessed as thought disordered on the Bannister/Fransella test using emotional and personality constructs, improve their intensity and consistency scores on a similar test involving physical constructs?

METHODSubjects

These consisted of the same twenty patients used in the previous study. A group of twelve normal adults were tested in addition.

The sample was split into three groups for the purpose of the experiment:

- (i) 'thought disordered' schizophrenics; (those subjects who scored below the cut-off points on the Bannister test, i.e. 1.000 on intensity and .49 on consistency measures). This gave a group of 8 subjects.
- (ii) 'non-thought disordered' schizophrenics; (those subjects who, having been clinically assessed as schizophrenic, did not score below the cut-off points on the Bannister test). There were therefore 12 subjects in this group.
- (iii) 12 normals - 12 adults, having no psychiatric illness.

Measuring InstrumentsBannister/Fransella grid test for thought disorder(i) personality construct version

This test was administered, in accordance with instructions given in the Manual, to all 32 subjects in the sample. Intensity and consistency scores were calculated for each subject.

(ii) physical construct version

The administration and materials were the same as those used in the personality construct version. This time it was stressed that the judgements were of physical characteristics alone. Again the intensity and consistency scores were calculated for each subject in the sample. With half of the subjects the physical version was given first, but there was found to be no effect of order.

Statistical analysis of results

The "percentage change" in the raw scores on the physical construct version as compared with the personality construct version was calculated for each group for (i) intensity and (ii) consistency measures.

The percentage change in (i) intensity and (ii) consistency measures between

(a) thought disordered and non-thought disordered schizophrenics;

(b) non-thought disordered schizophrenics and normals;

(c) thought disordered schizophrenics and normals;

were compared, using the Mann-Whitney U test. A total of 6 comparisons was therefore made.

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#### HYPOTHESIS

That the percentage change in (i) intensity and (ii) consistency measures for

(a) the thought disordered schizophrenics will be significantly greater than that for the non-thought disordered schizophrenics;

(b) the non-thought disordered schizophrenics and normal group will not differ significantly;

(c) the thought disordered schizophrenics will be significantly greater than that for the normal group.

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RESULTS

Table 1 shows the means and variances of intensity and consistency scores for both versions of the Bannister test for the three groups.

Table 1Means and variances of the 3 groups

	<u>Test</u>	<u>Intensity</u>	<u>Consistency</u>
<u>Thought disordered group</u>	(i) Personality construct version	m 498.1 v 7160	m .03 v .07
	(ii) Physical construct version	m 624.1 v 31481	m .38 v .06
<u>Non-thought disordered group</u>	(i) Personality construct version	m 1154.3 v 325169	m .70 v .03
	(ii) Physical construct version	m 936.2 v 115651	m .52 v .16
<u>Normal Group</u>	(i) Personality construct version	m 1052.5 v 47462	m .67 v .03
	(ii) Physical construct version	m 977.3 v 66045	m .76 v .02

( where m = mean )

( v = variance )

In general the results support the hypothesis.

The results are set out in the form of three tables (2, 3 and 4) which compare intensity and consistency percentage change scores between the three groups.



Table 2

Mean intensity and consistency percentage change scores  
for thought disordered and non-thought disordered groups

	<u>Mean</u>	<u>U</u>	<u>p.</u>
Thought disordered Ss (Intensity)	26.6	29	N.S.
Non-thought disordered Ss ( " )	- 3.1		
Thought disordered Ss (Consistency)	39.7	16	<.01 (1-tailed test)
Non-thought disordered Ss ( " )	- 9.1		

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This table indicates that there is a statistically significant difference between the thought disordered and non-thought disordered groups on consistency percentage change scores. Although the difference in the intensity percentage change scores is not significant there is a trend in the right direction to support the hypothesis.

Table 3

Mean intensity and consistency percentage change scores  
for non-thought disordered and normal groups

	<u>Mean</u>	<u>U</u>	<u>p.</u>
Non-thought disordered Ss. (Intensity)	- 3.1	68	N.S.
Normal Ss. ( " )	- 3.6		
Non-thought disordered Ss. (Consistency)	- 9.1	45.5	N.S.
Normal Ss. ( " )	6.0		

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This table indicates that there is not a significant difference between non-thought disordered and normal groups on either intensity or consistency percentage change scores.

Table 4

Mean intensity and consistency percentage change scores  
for thought disordered and normal groups

		<u>Mean</u>	<u>U</u>	<u>p.</u>
Thought disordered Ss (Intensity)		26.6	26	.05 (1-tailed test)
Normal Ss ( " " )		- 3.6		
Thought disordered Ss (Consistency)		39.7	21	.025(1-tailed test)
Normal Ss ( " " )		6.0		

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This table indicates that there is a significant difference between the thought disordered and normal groups on both intensity and consistency percentage change scores.

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### DISCUSSION

The results indicate that those schizophrenics who are thought disordered on the Bannister/Fransella grid test differ significantly from non-thought disordered schizophrenics and normal subjects; they show greater percentage improvement in their intensity and consistency scores when construing people according to physical characteristics than when construing them in terms of personality characteristics.

The thought disordered group improved significantly more than the other two groups. But did they have significantly higher scores on the physical construct version than on the psychological construct version? Did the non-thought disordered subjects score significantly differently in the two versions? To discover this, each of the three groups was analysed separately. The scores of each group on the physical construct and psychological construct versions were compared, using the Wilcoxon matched-pairs signed-ranks test (Siegel, 1956). Neither the normals nor the non-thought disordered schizophrenics differed significantly between the two versions. However, the consistency scores of the thought disordered group were significantly higher on the physical construct version. Their intensity scores were also higher, (i.e. more normal) on the physical construct version, but the difference was slightly less than significant

(Intensity:  $T = 6$ , N.S.; consistency:  $T = 1$ ;  $p < .01$ , 1-tailed test)

Does this improvement in scores on the physical construct version bring the thought disordered group's scores to the level of those scores achieved by the normal group, i.e. are the thought disordered schizophrenics 'normal' in their intensity and consistency

scores on the physical construct version? This possibility was investigated by comparing (i) intensity and (ii) consistency scores on the physical construct version between the three groups by the Mann-Whitney U-test. The normal group was found to achieve higher intensity and consistency scores on the physical construct version than the thought disordered schizophrenics.  
 (Intensity:  $U = 11\frac{1}{2}$ ; consistency:  $U = 11$ ;  $p < .01$ , 2-tailed test)

However, there was no significant difference between the thought disordered and non-thought disordered groups on either intensity or consistency

(Intensity:  $U = 28$ ; consistency:  $U = 36$ ).

The non-thought disordered schizophrenics and the normal group did not differ significantly either

(Intensity:  $U = 70$ ; consistency:  $U = 50\frac{1}{2}$ )

That the thought disordered subjects remained more disordered than the normals on the physical construct version may be attributed to two factors. The test situation could affect the schizophrenic patient more than the normal subject, causing differences in concentration, motivation and co-operation.

The other factor concerns the general construct system of the thought disordered schizophrenic. Essential to Kelly's theory is the fact that all sub-systems, e.g. physical and psychological, are eventually connected together. If the thought disordered schizophrenic's psychological construct sub-systems are abnormal this will have bad repercussions on his concepts of self integration which in turn affects physical constructs. McPherson (1969) found that while non-thought disordered schizophrenics tend to have persecutory

delusions, thought disordered schizophrenics are characterised by a preponderance of delusions of 'non-integration'.

It could be postulated that only the thought disordered group showed improvement because the non-thought disordered and normal groups had achieved scores at the ceiling or maximum on both intensity and consistency measures on the emotion and personality construct version. However, the mean intensity and consistency scores on both versions were well below the theoretically-possible maximum consistency score on both versions. For consistency scores this does indicate that there is room for improvement; for intensity it is not possible to estimate the optimum score as maximum intensity of relationship between the constructs because this in itself would indicate an abnormality in the construct system, i.e. the relationship score between two constructs being so high as to indicate they are the same construct.

Finally, it could be possible that the physical construct version is either so easy or so difficult that it is not a suitable discriminating measure. However, as may be seen from Table 1 (p. 57) means and variances on both versions are similar for the normal group, and non-thought disordered group.

In conclusion, the schizophrenic patients who show evidence of a severe disorder when using psychological constructs seem to be capable of using physical constructs more or less normally.

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GENERAL CONCLUSIONS1. The Personal Construct System of the Schizophrenic

The primary consideration of this thesis has been with disorders of thinking and expression of affect in schizophrenia. Kelly's Personal Construct theory has been employed to provide the basis of the hypothesis that those schizophrenics who do not use emotional constructs spontaneously are unable to use them logically when forced to. It is further suggested that the personal construct system which involves psychological concepts of emotion and personality is in some way deficient when compared with the system which involves physical evaluation.

It seems that the schizophrenics who avoid using emotional and personality constructs do so because they are only able to use them in a meaningless way. This incapacity to use meaningful concepts could perhaps be traced back to the schizophrenic's construct system 'model'. Although a construct system is a personal and idiosyncratic instrument, the cues and experiences used to validate it arise mainly from the schizophrenic's family.

This theory, then, is compatible with the theories of Lidz and others who implicate the family of the schizophrenic in the development of his psychopathology, and in particular in the development of his disorder of thinking. It is possible to postulate that inconsistencies in messages within the family of the schizophrenic give rise to ambiguities, and finally to 'thought disorder' in his use of emotional and personality constructs. As stated previously, physical constructs are more easily evaluated and do not involve subjective inter-personal situations. These systems are therefore not affected.

It is still necessary to attempt an explanation of why a child who has been brought up in this way actually "breaks down" to the extent of being classified as mentally ill and necessitating admission to mental hospital. It might be postulated that the child is encapsulated by his abnormally functioning family until the stages

of adolescence or post-adolescence when the problems involved in the processes of identity and independence arise. The anxieties aroused by these problems flare up when he finds he is unable to cope with outside pressures and relationships in the same manner as he has coped with family ones. This upsurge of anxiety may manifest itself as a schizophrenic breakdown with the signs of social withdrawal and deteriorating job performance often being present.

On admission he frequently complains of being unable to understand other people, of there being a barrier between him and them, or of not being on the same 'wavelength'. This would seem compatible with the theory of a deficient construct system which fails to allow him to communicate his feelings of, e.g. dependency, or to understand other peoples' expression of emotional feelings.

Theories explaining thought disorder will clearly have to consider the effects of the content of thought. They should not assume that thought disorder is an all-encompassing label to be attached to all abnormal thought processes.

## 2. Flattening of affect

The disorders of affect and thought processes which have been measured by psychological methods show a significant relationship with each other. Again the sign of flattening of affect may be seen in terms of construct theory. A schizophrenic who emerges as 'flattened' on the Dixon test is one who fails to use psychological constructs. This failure may be traced back to the experiences of the subject in the family situation where expressions of emotion were not encouraged and psychological constructs were continually invalidated by abnormal family interactions.

## 3. Sub-categories of schizophrenia

For psychiatric diagnostic purposes paranoid/non-paranoid and acute/chronic sub-categories of schizophrenia are commonly used. From the results obtained it seems that flattening of affect is a useful clinical sign in differentiating between paranoid and

non-paranoid categories, in that non-paranoid schizophrenics tend to show emotional blunting. Flattening of affect is not relevant to the acute/chronic dichotomy however.

#### Implications for further research

Great emphasis has been laid on the part played by constructs in the results obtained from this thesis. Clearly, more has to be learnt of the schizophrenic construct system - to discover by idiographic methods whether the abnormality postulated as existing in the psychological construct sub-systems plays such an important role in the illness of schizophrenia.

Individual repertory grids would help to determine relationship between sub-systems especially in the early stages of a schizophrenic breakdown where thought disorder is probably only present in areas concerning personal relationships and emotions. As the illness progresses the thought disorder may spread to other sub-systems as the construct system becomes weakened.

Study could also be made of the clinical interviews at these stages, where in the early part of the illness it might be hypothesised that the psychiatrist bases a large part of his diagnostic interview on determining the patient's relations with other people and his emotions concerning them.

Clearly further study of the schizophrenogenic family is also required. Idiographic techniques using, e.g. grid tests, could be employed to investigate the construct systems commonly used by the parents; here it might be expected that few emotional constructs would be used, and if they are present, they may bear little relation to other psychological sub-systems. They may also show, with time, considerable inconsistencies.

Finally, if the problem can be treated as one of 'modelling' on a poor prototype, the possibility of re-training could be investigated. This would involve helping the patient to build up new psychological construct sub-systems by providing situations with



maximum validation possibilities and minimal conflicting experiences. This would clearly involve a lengthy programme which would be severely interrupted by the schizophrenic's returning to his family.

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APPENDICES

APPENDIX IThree protocols of the flattening of affect test

The following three protocols are examples of subjects having:

- (i) K.F. - a low emotion category score (i.e. 'flattened')
- (ii) W.K. - a less flattened score
- (iii) N.M. - a normal non-flattened score

The relevant phrases are underlined and the category allotted is shown in the margin.

Following each protocol is a sample scoring sheet showing how the E% score is calculated.

Subject K.F.Set 1

Well, both photographs appear to be women. On the left hand  
 C picture the woman is wearing a headscarf but on the right hand  
 picture her head's just bare. No covering on her head. Both  
 B pictures seem to be out in the open. The right hand picture  
 seems to be just outside of a building and the left hand picture  
 outside, might be shrubbery or vegetation. On the left hand  
 S picture the woman may be holding something whereas the right  
 picture her arms are crossed and holding ..... and the left  
 E hand picture the woman is smiling and on the right hand picture  
 the woman looks rather pondering about something. On the left  
 hand picture the woman looks as if she was wearing a raincoat,  
 and right hand picture she just got, the woman has got a sort of  
 jersey blouse on. Both pictures seem to be in daylight. In the  
 G left hand picture the woman seems to be aged about fifty or  
 something like that, around about 50, and the right hand picture  
 D the woman would be about forty - fifty age. That seems to be all.

Set 2

Well, the left hand picture are two boys, right hand picture,  
 B two boys. Left hand picture the boys seem to be outside a shop,  
 A pavement outside a shop. Right hand picture the both boys are  
 S looking at each other, could be standing on soil or grass outside

of a building. On left hand picture they could have been, could be, rather average as far as ..... concerned, whereas possibly cloudy, whereas the right hand picture the sun is shining obviously taken in sunlight, the left hand boys' shadow on the ground. The left hand picture the boy is wearing a jerkin, both boys in fact, wearing jerkins. The right hand picture, the left hand boy has got his jersey on and braces holding up his trousers and the right hand picture the boy has got a jumper on buttoned down the front, cardigan buttoned down the front, and he's got long trousers, whereas the boy on the left hand picture has got shorts, the boy on the right hand picture has got longs on trousers ..... trousers. In the left hand picture the boys could be aged round about nine or ten, the right hand picture could be about four. The left hand picture there looks as if there may be snow on the ground, some snow on the ground; on the right hand picture the sun is shining. That seems to be all.

### Set 3

Both pictures are of boys. On the left hand picture, both pictures looks as if they could be in darkness, but the right hand picture, the left-hand picture looks as though he could be underground, and the right hand picture the boy seems to be in darkness somewhere, could be underground ..... In the left hand picture the boy is holding up something, I can't exactly see what it is and the right hand picture the boy, in the right hand picture the boy is a wooden, looks as though he's got the wooden, it's a piece of wood, and holding, and lying on a piece of wood or pieces of wood shaped together. On the left hand picture the boy has got his right hand up to his left shoulder and his other hand is carrying something. The boy on the right hand picture has his left hand up to the wood and his right hand down to his belt. On the left hand picture the boy is looking just away from the camera and on the right hand picture the boy is looking at the camera. Both boys seem to have caps on. The boy in the left hand photograph has got a dark cap on. The boy in the right hand photograph has got a light cap on. The boy on the left hand photograph seems to be looking at something. The boy in the right hand photograph is, he's looking at the camera. That seems to be all.

Set 4

Well, two persons in each photograph. Left hand photograph and right hand photograph. On the left hand photograph there's

N S a boy, looks as though he is a negro and looking down to another boy, looks as though it's a boy, a baby and the right hand photograph the shows a woman holding up a baby, the baby looking on top of the woman's head. In the left hand photograph the ..... seems to be boy. The left hand photograph seems to be a negro. The baby might be a negro as well, although I just couldn't say. In the

X left hand photograph - both photographs could be taken in daylight.

B In the left hand photograph there's a, looks like a sun hat on a table near the window. On the right hand sand there is a ..... picture of the woman and the child, can't see anything else. Both photographs in daylight probably and the in the left hand photograph

C there seems to be, could be of clothes, clothing or something underneath it, whereas in the left hand photograph there's nothing like that at all. In the left hand photograph, the negro, boy on the left hand side photograph could be about, be about ten or

G eleven years of age. Can't say, very difficult to say what the other person is, the other child, what age the other child is. On the right hand side the woman could be round about thirty, thirty to forty, and the boy, the little child she is holding up in her arms could be about months or so old, be about a year or two old. Both pictures taken in daylight.

Set 5

Well, in the left hand photograph, right hand photograph, the

N left hand photograph the man is surely a European and in the right hand photograph negro. In the left hand photograph the man is

A B turning over pages in a book, on the right hand photograph the negro is looking out at, looking, just past the camera into the distance. The right hand, the man on the left hand photograph is turning over pages in a book, the man on the right hand photograph is only, he's only ..... beside him. In the left hand picture there's more darkness than the right hand picture. The man on the

G left hand photograph is about seventy, just over seventy years  
of age; the man in the right hand photograph, the negro, would  
be in his thirties or so. In the left hand photograph the  
C man's wearing a watch; in the right hand photograph the man  
D doesn't seem to have a watch at all. That seems to be about it.

Flatness of Affect Test

Name K.F.

Date 24.7.68

Age 23 years

	Sets				
	1	2	3	4	5
A Activity		x	x		x
B Background	x	x	x	x	x
C Clothes	x	x	x	x	x
D Denial	x	x	x		x
E Emotion	x				
G Age	x	x		x	x
N Nationality				x	x
O Occupation					
P Physique					
R Irrelevant					
S Stance	x	x	x	x	
X Photo				x	
E	1	0	0	0	0
Category	6	6	5	6	6

Total E = 1 .% = 3.5%

Total Category = 29

Subject W.K.Set 1

One picture on the left is a picture of a lady, obviously  
 E O in anguish. The picture on the right looks like a peasant lady,  
 who is, who appears to be, quite happy. I don't know what she  
 A has holding in her hand, but she looks like a peasant lady and  
 N ( lady on the left looks like an ordinary British housewife, who is,  
 G I would say, aged about in her forties, her late forties. The  
 other one is a peasant lady roughly aged about, probably the same  
 age, but with different backgrounds, completely different back-  
 grounds entirely and different countries, so I believe. This  
 lady on the right, presumably a peasant lady, appears to be quite  
 happy in the type of work she is doing. The lady on the left  
 is worrying about something, pensive, worrying about something.  
 P You can see traces of worry on her forehead and in her eyes and  
 in her lips. Complete contrast from the photograph on the  
 D right. Other than that there's not much more I can add. The  
 lady on the right, I would say she doesn't appear to be British;  
 I would say, if anything, she looks like Hungarian. She looks  
 like as if she is a Hungarian peasant lady but I don't know  
 B the articles that she is holding in her hand which might describe  
 her profession or whatever she is doing or her job. The lady  
 on the left looks like a typical British housewife who is  
 besieged with problems which seem to be unsurmountable or something  
 like that. Pensive. Other than that there's not much more  
 I can add to either of these photographs.

Set 2

These are - the photograph on the right looks like as if  
 N G they are British youngsters about 6 or 7 years of age. The  
 X photograph's not quite so clear but they look to me as if they  
 A are playing a game or - the boy on the left is challenging  
 E someone, probably the boy on the left looks more ferocious; not  
 ferocious - you can't say that of a young boy - but aggressive;



he looks as if, he has an aggressive face, probably this may be in fun with the boy on the right; this may be a game they are playing; they look either Americans - they are either American or British boys about seven years or eight years of age, six, seven years of age. The boys on the left, I would say, are younger and they are obviously just playing a game on the sands. They look, by their colouring, they look, they could be either American or British. By that I would say if they are English they belong far south in Cornwall, Devon. If they're American - they like American style clothing and they're obviously having a good time at some childish, some childish game they are playing. On the other hand, the other two boys are playing a game, they're slightly older, if it's a game they're playing; one has his hands clenched I noticed, as if he is going to strike the other boy, and he has that aggressive look on his face. The other boy looks as if he has been taken unawares; this may be the outcome of aggressiveness in later years in that particular boy. Other than that, the photograph on the left showing the two young boys I would say they're obviously just having a game. There's not much more I can add to that one. I am struck more with this photograph on the right which shows the aggressiveness of a young boy, to have such an aggressive face and to have such a clenched fist. He only looks about seven or eight according to that photograph. He looks very young anyway. There's nothing more I can add to that.

### Set 3

Both are young boys and they look to me as if they have been taken during Victorian times according to the, to the, to the dress they are wearing. They're either in Victorian times or either that or the other one is foreign, but I think, I would say, that they are rather young to be working, they are not very old, they are about fifteen and they are working, they appear to be working. I don't know what the boy is holding on his shoulders - appears to be concrete slabs or something like that - bricks. There's not much I can say really about the one on the left; he looks to

me as if he is working underground, probably in Victorian times again. It's difficult to assimilate these pictures because they only appear to be ordinary working boys I would say in the Victorian era. One is working outdoors and I would say the other one was working underground. The photograph was presumably possible, which was not possible by about, there was, meant to give that effect, not possible to photograph in Victorian days underground, but it was meant to give that effect, that photograph. The one on the right looks like a modern-day building, builder's labourer, but only placed in Victorian settings. Other than that there's not much more I can add to that.

#### Set 4

N The one, the photograph on the right looks like a Nigerian  
 O doctor examining a Nigerian; it could be an Nigerian doctor  
 A examining a young baby or it could be a father looking at his son,  
 but there's something about the way he is looking at the young  
 P baby's been ill or something like that and he's looking for some-  
 thing hidden in the baby. The other one is the extreme opposite,  
 the, it could be, the father and very young baby, obviously having  
 B a good time, probably at the beach, they could be at the beach and  
 the father's giving the young baby a pick-a-back, but the other  
 one on the right is more concerned about, this father and son,  
 E Nigerian I would say is worried about the baby and it could on the other  
 hand be a doctor examining the baby, but there's definitely a  
 distinct difference between the two photographs; I would say this  
 one may be father and son probably and this other one could be  
 father and son, but, Nigerian I would say, but there is more anxiety  
 in this photograph somehow or other than in the photograph on the  
 left. The photograph on the left shows happiness to a great  
 degree. The other one on the right shows thoughtfulness and  
 concentration in respect of either the father or it could be a  
 doctor - I can't make up my mind what he is and he's looking at  
 this young baby who possibly could be ill. Other than that  
 D there's not much more I could add.

Set 5

I would say the photograph on the right is obviously an African chap; I would say, would place him in his thirties, an African chap placed in his thirties. He looks very outdoor, very active, very lively, the picture suggests liveliness about him. Although his eyes are fore-shadowed it still gives the face, somehow or other gives the impression of outdoor activity and so on. The picture on the left on the other hand is a man in his sixties. He's obviously, he looks as if he could have been a lawyer, or somewhere in the professional line because he's a book in front of him and I see the worry lines on his forehead and on his face. He's obviously been professional, he could even be in the ministerial side, either in religion or politics or law; I don't know what profession he would be in but he's obviously been a professional gentleman spent years indoors as against the picture on the right where this apparently younger chap from Africa is more athletic and could possibly be, have spent most of his time outdoors and practising athletics in contrast to the photograph on the left, where the gentleman's obviously pondering and thinking over a book, you know. There is a complete contrast; one is African and I would say that this looks like a British or American as I say either lawyer or professional businessman who is I would say if he's not of retirement age, he's just past retirement age I would say so. On the other hand the photograph on the right looks full of athletic, full of vitality - outdoors.

Flatness of Affect Test

Name W.K. Date 31.7.68  
Age 28 yrs.

	1	2 Sets	3	4	5
A Activity	x	x	x	x	x
B Background	x	x	x	x	x
C Clothes		x	x		
D Denial	x	x	x	x	
E Emotion	<del>x</del>	<del>x</del>		<del>x</del>	
G Age	x	x	x		x
N Nationality	x	x	x	x	x
O Occupation	x			x	x
P Physique	x	x		x	x
R Irrelevant					
S Stance		x			
X Photo		x	x		
E	1	1	0	1	0
Category	8	10	7	7	6

Total E = 3 .% = 7.9%

Total Category = 38

Subject N.M.Set 1

P C One is very emaciated and hardly any clothes on. She  
 O looks as if she is in a sort of concentration camp state of  
 N health. The other one looks very healthy indeed, country peasant  
 E obviously, probably Russian. She seems to be that kind of  
 slavonic type person. She's well fed, of course, unlike the  
 other one who's almost despairing, looks of despair and complete  
 misbelief in her eyes, and the jolly one, fatter one, plump one  
 anyway, is much happier, showing her teeth in a smile. I  
 wouldn't know the difference whether this, the one that to me  
 seems to be so thin, that if I didn't know by looking at her  
 clothes that she was a woman, I would have thought she was a man,  
 just by looking at her face, because it's so wrinkled and beaten  
 with weather and lack of food, etc. that she could almost be man.  
 She, this one, this same one's very cold because she's clinging  
 S to her arms. She's folding her arms up to keep herself warm.  
 The jolly one, she has got a hook nose; the thin one's got a  
 straight pointed ordinary pointed nose, that's a facial  
 D distinction. That's about all I can see really.

Set 2

B A Well, the two boys in the hot climate are playing with each  
 E other happily; they're both smiling, because although I can't see  
 one of the boy's faces in that photograph, his muscles at the  
 P side of his face are in a smile as ..... otherwise and they're  
 C probably urchins by the look of their clothes and they have bare  
 feet of course, whereas the other two, one of them is about to  
 hit the other boy in the same photograph, and he's probably a  
 sadist by nature since he's wearing leather, leather jerkin.  
 The boy he's going to hit, he's too ignorant to, in as much as he  
 doesn't know what to do, how to get out of this situation.  
 S Oh, he is clutching the other hand with the boy's hand with his  
 own hand, but it doesn't really mean anything. They're probably

O just as poor as the other two in the other photograph, although  
 they're city boys, or I suppose they are both city boys.  
 The two city boys, the two boys that are fighting, are much  
 G thinner in the face than the other two, a bit older, I think.

### Set 3

O E The one who's doing the bricklayer's job, he's got a sullen  
 X look in his face as if he's annoyed that the photograph has been  
 P taken of him. He looks healthy enough, he's got a fat enough  
 A face, seems to be very strong in as much that he's carrying a hefty  
 B load of bricks on his back, on his shoulders. The other boy  
 who's working at some fil~~l~~thy job, I don't know what it is exactly,  
 it could be down a mine or in an engineer department. He's got  
 a cut thumb, he's got a look of bewilderment on his face as if he  
 doesn't know what he's doing in the place, like this. He's very  
 dirty, the dirt is almost ingrained into him, whereas the brick-  
 C layer is much cleaner looking. The bricklayer's muffled up to  
 the chin, which could mean that he's, he fears the cold, or it  
 is cold where he is in his job, which is natural because it will  
 probably be outside and the other one probably works inside because  
 he's got his arms, the arms of his overall or whatever it is, up  
 to his elbows. The bricklayer could look as if he is in the  
 job and is ready to go on and on and on, whereas the other boy  
 looks completely tired out. I don't think there's much else I could  
 D say, really.

### Set 4

N Well, there's a father and son white-coloured and there is a  
 E father and son negro. The negro man is worried about his son,  
 P A obviously, because he seems to be ill. The white man is frolicking  
 and laughing with his son, they both seem well fed. So do the  
 negroes, but the father negro has a strong looking arm, forearm,  
 which suggests that he probably has a hard job to do. He is  
 O probably not very well off, probably still in his native environ-  
 C ment actually, because it seems to be a kind of native costume he's

got on. Then maybe that could be a leg showing, or a trouser leg, I'm not sure which. He is worried about his son, whereas the white man isn't other than happy, I suppose. There's a great likeness in the facial appearance of the two men, really.

D Their noses are similar. That's all I can see.

Set 5

N Here we have again a negroid and a white-coloured man. The  
 E negro one seems to have a look of despondency or despair on his  
 face, sadness or depression, seems to be wondering what's hit him,  
 sort of, and he seems to be wondering if he should protest almost.  
 C He's again in a hot climate, he's got a tee shirt on. The other  
 O man, who could be a minister, everything seems to be dressed in  
 A B black and besides he is reading a big tome which could probably  
 be the Bible. Again the white-coloured gentleman is a very glum,  
 P all very serious, dead pan, bush eyebrows, still got a good set  
 of hair for his age. The negro has got close cropped hair and  
 looks as if he's got a weather-beaten face. His brows are  
 G wrinkled, yet he is probably much younger than the minister, if  
 we can call him that, who is also very wrinkled at the brows, and  
 indeed all his face is sallow and hanging with skin, gnarled  
 hands. The negroid, the despairing looks in his eyes, but the  
 minister he's got a pair of cold hard eyes and his mouth is  
 scowling and all the other lines in his face, lower half of his  
 face are falling lines of his lips, shows that he probably has a  
 permanent scowl, whereas the negro just has an ordinary look on  
 his face, so far as I can see anyway. I think there again that's  
 D about all I can see.

Flatness of Affect Test

Name N.M.

Date 10.12.68

Age 19 years

	Sets				
	1	2	3	4	5
A Activity		x	x	x	x
B Background		x	x		x
C Clothes	x	x	x	x	x
D Denial	x		x	x	x
E Emotion	x	x	x	x	x
G Age		x		x	x
N Nationality	x			x	x
O Occupation	x	x	x	x	x
P Physique	x	x	x	x	x
R Irrelevant					
S Stance	x	x			
X Photo			x		
E	1	1	1	1	1
Category	7	8	8	7	9

Total E = 5 .% = 12.8%

Total Category = 39



APPENDIX IIInter-scorer reliability

The Dixon test requires that the responses given to the photographs are analysed into the categories previously listed (p. 11) For the purpose of this thesis it was necessary that there was high inter-scorer reliability.

Method

Sixteen of the protocols obtained from the schizophrenics were analysed independently by two raters. A Kendall rank correlation (Siegel, 1956) was carried out between the two experimenters' analyses of the sixteen protocols. Only the first occurrence of each category to each pair of photographs was noted.

Results

The correlation obtained was statistically significant ( $\tau = 0.82$ ;  $z = 4.43$ ;  $p < .00003$ , 1-tailed test).

Conclusion

This result indicated that there is statistically a very high degree of agreement between the two raters, and that the method of analysis employed in analysing the Dixon test is therefore reliable.

APPENDIX IIIFurther notes on the scoring methods employed in the Dixon test

The details of the scoring procedure for the Dixon test will be investigated further in this appendix.

(i) Relationship between scoring methods involving (a) first occurring responses (b) all responses.

As previously mentioned only the first use of each response category, e.g. activity, to each pair of photographs, is noted for the purpose of calculating the percentage emotion score for each protocol. This method is quicker and possibly more reliable. However, it is necessary to ensure that by adopting it no great alteration is made in the final percentage emotion score.

Method

Sixteen of the protocols obtained were fully analysed, with each and every category of response given to the five stimulus pairs of photographs noted. A category response was said to end when another category was introduced, e.g.

X ".... The photograph's not quite so clear but / they look to me as if  
A they are playing a game or/- the boy on the left is challenging  
E someone, probably the boy on the left looks more ferocious ...."

The percentage emotion score was calculated for each protocol using (i) first occurring responses (ii) all responses. A Spearman rank correlation was then applied to these scores.

Results

Mean E% (by usual method)	=	13.7%
(by new method)	=	14.7%

The correlation between the scoring methods was statistically significant.

( $r = 0.76$ ;  $z = 4.11$ ;  $p \ll .00003$ , 1-tailed test)

Conclusion

This result indicates that there is a statistically significant relationship between the two methods of scoring. It is therefore sufficient to use the more convenient scoring method of noting the first occurrence of each category to the stimulus pairs of photographs in calculating the percentage emotion score.

(ii) Relationship between raw emotion scores and percentage emotion scores

Dixon (1968) suggests that two methods of obtaining emotional category scores may be used. One involves raw scores alone where the range is from 0 - 5; the other involves comparing emotion category scores with total category scores and turning this ratio into a percentage emotion score. This latter method corrects for the factor of differing total output from each subject. Both methods have been employed in this thesis and it was considered necessary to assess the degree of correlation between them.

Method

Twenty protocols were allotted two scores - an emotion category raw score and an emotion category percentage score, by the methods previously described. These scores were then correlated using the Spearman rank correlation.

Results

The correlation obtained, when ties had been taken into account, (Siegel, 1956) was statistically significant ( $\rho = .87$ ;  $p < .0005$ , 1-tailed test).

Conclusion

This result indicates that there is a statistically significant relationship between emotion category raw scores and emotion category percentage scores.

For the purpose of clinical assessment and research involving the allocation of schizophrenics to 'flattened' or 'non-flattened' groups Dixon has suggested that an emotion category raw score cut-off point of 3 and under is used as an indication of an abnormal score. All normals and non-flattened schizophrenics score at least 4 or 5. The emotion category percentage score cut-off point is not so clearly defined and an arbitrary one of 10 and under was employed in this thesis to indicate an abnormal score. However, the correlation obtained indicates that these scores are reliably interchangeable and it is suggested that the score is used which is most convenient to the statistical treatment involved.

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