"A COMPARATIVE STUDY OF AUTISTIC, SCHIZOID AND 'NORMAL' CHILDREN"

ANNE D. BARLOW
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Anne D. Barlow
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ABSTRACT

A comparative study of a group of high-grade, speaking autistic children, a group of schizoid and a group of normal children has been carried out. The children were individually matched for age, sex and intelligence. Cognitive and language abilities as well as aspects of their conceptual systems were investigated.

The results indicate that the schizoid personality disorder embraces a group of children distinct from autistic on the one hand and normal on the other.

The schizoid children showed a greater spread in intellectual ability than the normal group. In all cognitive, language and memory tests they were more distractable. In language function, particularly on the representational level they showed similar disabilities to the autistic group though to a lesser extent.

The emotional uninvolved, described in schizoid and autistic children, was more marked in the schizoid than the autistic group when investigated with the Flattening of Affect Measure.

The highly selected group of autistic children still showed some of the peculiarities of cognitive, language and memory function though to a lesser extent than in other studies in which broader cross-sections of the autistic population were investigated.
INTRODUCTION

Childhood psychiatric disturbances characterized by defective social relationships have been classified according to a number of headings but the clinical boundaries between the various types have not been firmly established. This thesis is concerned with the schizoid personality disorder and childhood autism and seeks to clarify the situation with respect to these conditions by means of psychological measures.

PART I: CHILDHOOD AUTISM

A. Clinical Aspects

Any study of autistic children has to mention Kanner's early description of the syndrome stressing as cardinal symptoms "a combination of extreme aloneness from the beginning of life and an anxiously obsessive desire for the preservation of sameness". (Kanner, 1943). Since then much controversy has centred around this condition. This is even apparent in the varying designations such as Childhood Psychosis (Goldfarb, 1961), Childhood Schizophrenia (Creak et al, 1961).

The classification of psychotic disorders in early childhood has been clarified recently by Rutter (1967). Three main groups are proposed. The basis of division is mainly age of onset. The late onset group is seen as similar in form and outcome to the adult form of schizophrenia; it rarely occurs before the age of eight years. The middle group mainly consists of organic disorders of varying aetiology. Children in this group regress by the age of three to five years following a period of normal development. Only the early onset group is regarded as similar to Kanner's syndrome. Most of the children in this group show abnormalities from early infancy; roughly a fifth appear to regress in the second year of life, a few regress between two and three years and only very rarely does the condition develop in older children.

1. Description

A chief characteristic of early onset psychosis or childhood autism, a term the present writer prefers, is an autistic relationship with other
people. This is mainly shown by "marked aloofness and distance, an apparent lack of interest in people, an avoidance of eye to eye gaze and a failure to interact or form continuing relationships". (Rutter, 1967 p.135). Language impairment or complete absence of speech is another abnormality. Ritualistic, stereotyped forms of behaviour and compulsive phenomena occur in most of these children. These may take the form of abnormal attachments to curious objects like bits of string or a piece of wood, or abnormal preoccupations, which may be simple like whirling a piece of paper, or complex like a preoccupation with sizes and quantities. Insistence on sameness, one of Kanner's criteria, which often manifests itself as insistence on a fixed routine and a non-adaptability has a striking obsessive quality; a child may find alterations in the arrangement of furniture unbearable. Motor mannerisms and inappropriate responses to sensory stimuli, particularly sound, have also been noted.

These symptoms characterize the autistic child in early childhood. Some features are greatly modified or not found at all in the older child.

2. Prevalence

In several studies a similar incidence of childhood autism has been found. Lotter's (1966) epidemiological study of eight, nine and ten year old children resident in the County of Middlesex revealed a rate of 4.1 per 10,000 whereas Rutter (1967) found 4 per 9,000. Both figures included slightly atypical cases. Brask (1967) - cited in Hermelin and O'Connor (1970) - also found a prevalence of 4.3 per 10,000.

All studies show a predominance of boys over girls; 2.5 to 1 in Lotter's (1966) survey but as high as 4.3 to 1 in Rutter's (1967) study. Several investigators found a greater incidence in first-born children, e.g. Kanner (1954), Creak and Ini (1960), Rutter (1967) and Hermelin and O'Connor (1970). However, since ordinal position is related to size of family, age of parents and social class and the above studies could not thoroughly control for these factors, no definite statement can as yet be made.

3. Prognosis

Follow-up studies, reviewed by Rutter (1966 a), found that about half
the cases were in hospital in early adult life and only 5% were in employment. Normal educational and social progress was only present in about 15%. "Autism" was less marked in a few cases but no accompanying increase in measured intelligence was found. Relatively high I.Q. at five years of age was found to be a good prognostic sign. In about half the cases impairment or absence of speech continued as a severe handicap into adolescence.

B. Psychological Studies

1. Cognition

Several studies have investigated the intellectual level of autistic children in order to solve the question of the association between autism and mental deficiency. Wing (1966) states that autism can occur at any intelligence level. However, most investigations found a strong bias towards lower levels of intellectual functioning, e.g. Lotter's (1966) epidemiological study, mentioned above, showed that about 70% of his subjects had I.Q.'s below 55 (22 out of 32) as measured on the Seguin Formboard. Of the remaining ten, six were below I.Q. 80, three were within normal limits and only one was above average. Rutter (1966 b) mentions that in the Maudsley study, 40% of the autistic children were untestable or had an I.Q. below 50, 30% had an I.Q. below 50 and 69 and 30% had a score of 70 or more.

Rutter found that autistic children showed a greater variability in intellectual functioning than did control children of the same I.Q. Autistic children are often untestable on verbal tasks and those that have useful speech are nevertheless worst on tasks demanding abstract thought or symbolic and sequential logic. They are best on those problems requiring manipulative or visuo-spatial skills and also immediate rote memory. This specific patterning of intellectual functioning is often referred to as "islets of normal intelligence". It is much more pronounced in autistic children with retarded language than in those with normal language.

Another relevant finding in the field of cognition concerns the higher intellectual, educational and social level of the parents of
autistic children found in several studies (Kanner, 1943; Creak and Ini, 1960 and Rutter and Lockyer, 1967). It might be argued that the high frequency of intellectual parents in these studies was merely a referral artefact. However, the results of an epidemiological study (Lotter, 1967) would appear to refute this suggestion. He found the parents of his probands to be superior in socio-economic status (p<0.02), intelligence and education (p<0.001) to those of his control group of subnormal children with some signs of disturbance.

2. Perception

Abnormal responses to sensory stimuli are key features in the behaviour of autistic children which can take the form of under- or over-reaction to stimuli or even both in the same child. This inappropriate use of sensory stimulation can be so marked that some researchers have come to view autism as the "consequence of multiple sensory handicaps".

Wing (1969) compared the behaviour of autistic with that of normal children, receptive aphasic, executive aphasic, partially blind/partially deaf children and those with Down's syndrome. Abnormal responses to auditory as well as visual stimuli, and a preference for the use of the proximal senses was more marked in the autistic than in the normal or mongol groups. The autistic children resembled the partially deaf/partially blind group in their sensory responses as well as their abnormal motility patterns. The autistic children were found to have multiple handicaps, combining difficulties of language and comprehension with right-left, up-down and back-front disorientation as in congenital aphasic syndromes.

Other workers such as Goldfarb (1961), Rimland (1964) and Wing (1966), have also found a preference for proximal receptors such as touch, taste and smell and an avoidance of distal receptors such as vision and hearing in the autistic child.

In an important series of experimental studies designed to investigate possible defects in the perception and integration of sensory stimuli in autistic children, Hermelin and O'Connor (1970) showed that selective fixation of simultaneously presented visual displays was similar in
autistic and young normal children. Both groups looked longer at a coloured than a black, a striped than a grey and a meaningful than a random display, so that perception of differences seems relatively unimpaired in autistic children. However, the autistic children fixated all stimuli for a significantly shorter period and made fewer comparisons than the controls. In another experiment autistic children needed more trials to solve a length discrimination problem than did normals. However, when visual discrimination tasks were arranged so that distinct movement response cues were available, autistic children performed as well as normals of similar mental development. A further experiment showed that speaking autistic children needed more trials to learn shape and directional discriminations than those involving brightness or size whereas controls showed no such differences. Non-speaking autistic children, on the other hand, could solve none of these discrimination tasks.

Hermelin and O'Connor also studied the hierarchical structure of sensory dominance in autistic, subnormal and normal children. Using bi-modal simultaneous stimulation of light, sound and touch, autistic children were found to differ in their hierarchical pattern of sensory responses from the other two groups. The subnormal as well as the autistic children's responses were less determined by the mode of stimulation than by the position and the intensity of the stimuli.

In visual-motor discrimination tasks, autistic children were found to rely on distinct motor cues. When these were present the children could often solve the task but not in their absence. Hermelin and O'Connor (1970) summarize their findings as follows (p.60) "All these results lend support to a hypothesis, which links the clinically observed preference of autistic children for proximal receptors to a tendency to process and make use of information from induced and active movements. In other words the children seem to rely more on perceptual activity than on perceptual analysis." And "... efficient performance depends on the integration and intercorrelation of input and output data, and on the processing of information from various sources. It is this function which seems impaired in autistic children and leads to their apparently abnormal response behaviour to sensory stimuli".
3. Language and Recall

Clinically, the most striking and probably the most common characteristic found in autistic children is their language deficit.

In most samples, between 30 and 50% of autistic children are reported to have remained mute. For instance, in Rutter's (1966) sample of sixty-three autistic children only ten reached a normal level of speech development, whereas twenty-nine remained mute. In Lotter's (1967) Middlesex survey, nine out of thirty-two eight year olds were mute and also Mittler, Gillies and Jukes (1966) found that nine out of twenty autistic children remained without useful speech. Even in those autistic children who do learn to talk, language development is rarely completely normal.

The abnormalities of speech take various forms, of which a limited vocabulary and echolalia are the most common. Delayed echolalia is particularly typical of the autistic syndrome whereas short-term echolalia is also commonly found in sub-normal children. The often-mentioned pronomial reversal by autistic children using "you" rather than "I" when talking about themselves should also be regarded as an instance of echolalic speech, rather than as some indefinable "unawareness of their own identities".

The peculiarities of language used by autistic children have been described by Kanner (1946), by Wolff and Chess (1965), by Rutter (1966a) and more recently by Cunningham (1968).

Since the use of language involves several modalities and is not a unitary process, it is important to determine which of these different aspects of the language function is impaired in autistic speech and to what extent. The Illinois Test of Psycholinguistic Abilities (McCarthy and Kirk, 1961 and 1968) has been used for this purpose (Tubbs, 1966). This test has been developed from a psycholinguistic model by Osgood (1957a, b, as cited by Kirk, McCarthy and Kirk, 1968) which comprises three main dimensions (1) levels of organization, (2) psycholinguistic processes and (3) channels of communication. There are two levels of organization, the representational and the automatic-sequential. On the representational level the test is concerned with mediating activities, with the understanding of meaning and with linguistic symbols. On the
automatic sequential level, retention of sequences and automatic habit-chains are tested. The processes involved are decoding (the receptive process), encoding (the expressive process) and association. On the representational level tests of decoding are concerned with the understanding of words or pictures. Association processes are tested by relating one word or picture to another and encoding is defined as the expression of ideas in words or gestures. Tubbs gave this test to ten subnormals, ten normals and ten autistic children. She found the autistic children to be significantly weaker overall than both the other groups though the three groups had been matched on the Peabody Picture Vocabulary Test. The autistic children were not inferior at tests of visual decoding, i.e. deriving meaning from pictures and visual association, but they performed badly in the analogous auditory-vocal tests, i.e. they had difficulties in deriving meaning from verbally presented material as well as associating verbal material. They were particularly poor at tests which required spontaneous output and cross-modal coding.

In a set of experiments O'Connor and Hermelin (1965) attempted to determine the nature of the defects underlying the speech handicaps of autistic children by ingeniously using non-linguistic analogues of those processes thought to play a part in the underlying cognitive structure of language development. Four of these hypothetical aspects of linguistic functions were selected for study: seriation or ordering, cross-modal coding, immediate memory and cue-matching ability. These were translated into four perceptual-motor tasks and given to speaking as well as non-speaking autistic and subnormal and normal children. Speaking autistic children failed the seriation task and did less well than subnormals and normals of the same mental age on the cue-matching task. On immediate memory the speaking autistic children behaved like the subnormal and normal subjects. On the cross-modal coding task, the autistic as well as the subnormal groups had chance results, and only the normals performed somewhat better; however the non-speaking autistic children performed very poorly on all four tasks.

Since one of the outstanding characteristics in the performance of autistic children is their good rote memory, evident in their echolalia, Hermelin and O'Connor (1970) investigated this aspect of the language
function more fully. Autistic children were found to remember at least as many randomly arranged words as normals and subnormals. However, when sentences instead of random words were used, the controls improved significantly but not the autistic children. In a further experiment in which attempts were made to study the effect of recency and sequential order on recall, normal children recalled sentences better than random words regardless of their serial position. In autistic subjects, on the other hand, strong recency effects determined recall more than did the type of verbal material. Hermelin and O'Connor (1970, p. 91) remark that though auditory-verbal memory capacity is not impaired in autistic children, the recall process depends on an 'echo-box type' memory store. Coding and categorizing processes are deficient and 'sense' is little better remembered than 'nonsense'. On the strength of these results, Hermelin and O'Connor (1970) hypothesized an input processing deficit in autistic children. This has been confirmed by Frith (1970) in a series of studies on pattern detection in normal and autistic children. In one experiment she asked children of each class to build rows of colours according to predetermined binary patterns; in another they had to recall auditory binary patterns. Analysing the errors made by the subjects, she found that normal children tended to reproduce the dominant feature of the presented series whereas most errors made by autistic children were due to perseveration or alternation tendencies independent of the given patterns. They thus showed a tendency for pattern imposition coupled with a deficit in feature extraction of ordered or structured input. When asked to invent binary sequences themselves, normal children gave these sequences non-random structures; older children made more complex and younger children simpler patterns. Autistic children imposed the same rules as they imposed in situations where the task was to extract the given rule, mainly showing perseveration.

4. Arousal and Responsiveness

A number of studies have attempted to account for the abnormalities of behaviour found in autistic children in terms of faulty arousal mechanisms. Rimland (1969), for instance, speculated that disturbances of the function of the reticular formation were responsible, whereas Hutt
and his colleagues suggested an association between autism and chronically high physiological arousal (Hutt, Hutt, Lee and Ounsted, 1964). They based this hypothesis on the following findings: (1) Autistic children have resting EEG records with a predominance of low voltage, fast desynchronized waves. (2) Behavioural withdrawal and stereotyped behaviour are both associated with states of high arousal in animals. (3) An increase takes place in stereotyped behaviour with increasing environmental stimulation, whereas decrease in stereotyping and increase in synchronisation of the EEG takes place in an empty room. (4) Autistic children have high thresholds for pain and auditory stimulation attributable to a possible blocking of sensory pathways. (5) They strive to maintain "sameness".

Hermelin and O'Connor (1970), however, find such concepts too general and ambiguous to explain autistic behaviour, since states of arousal can be measured in terms of physiological indices, or in terms of behaviour. Such physiological indices include measures of cortical and autonomic activity. Behavioural indices can be measured in terms of attention and vigilance. These different measures are not always consistent with each other as there may be differing degrees of responsiveness co-existing in different systems, rather than one general arousal state.

A number of their findings are also not consistent with an "over-arousal" theory. They found that subnormal and autistic children show similar interest in relatively novel as compared to relatively familiar stimuli. However, since subnormals have, on the whole, been found to be underaroused (Berkson, 1961 as cited by Hermelin and O'Connor, 1970), one would have to account for the relative lack of interest shown in novel stimuli by both groups as a function of underarousal in the case of subnormals and overarousal in the case of autistic children. Also their EEG studies do not agree with Hutt et al's theory. Self-generated behaviour did not increase with increasing complexity of the situation. Again, this is not consistent with an over-arousal theory.

The cardinal symptom of childhood autism is commonly thought to be absence of meaningful social and emotional relationships. The underlying reasons for this withdrawal, however, have been variously interpreted.
The impairment of emotional relationships is the most important of Creak's (1961) nine diagnostic points and Rutter (1966) showed that it persisted after other symptoms had subsided. Most investigators agree that social and emotional withdrawal is more typical of younger than older children and more marked in relation to other children than to adults. Hermelin and O'Connor (1970) link this social unresponsiveness to a failure to process incoming sensory information adequately rather than that withdrawal is a consequence of disturbed mother-child relations. The abnormalities of speech in autistic children with the resultant impairment in communication can also be regarded as contributing to the impression of social unresponsiveness.

Measuring social responsiveness in simple and rather narrowly defined situations, Hermelin and O'Connor (1970) found attention to stimuli less sustained in autistic children than in subnormals and normals. However, autistic children also gave relatively more responses to a person than to other stimuli. They looked longer at a picture showing a face than at other visual displays. They also looked as much at a human face with closed as with open eyes, giving no indication of "gaze avoidance".

These researchers conclude that their results (1970, p.120) "gave no support to the view that the behaviour of autistic children towards people or images of people is specifically impaired in comparison with their behaviour towards objects".

C. Aetiology

A great number of factors have been invoked and most theories involve a combination of several of these factors which could be classified as follows:

(1) Genetic
(2) Brain Damage
(3) Psychogenic
(4) Abnormalities in reinforcement of the child's behaviour
(5) Cognitive defects and perceptual abnormalities

Rutter (1967) argued that although there is a distinct group of cases with all the characteristic features of autism, the overlap with
other conditions is considerable. Thus it is unlikely that a single etiological factor could account for all cases.

The evidence for a genetic aetiology is inconclusive. It is based on twin-studies but the results of the few fully authenticated cases in monozygotic twins do not favour this hypothesis. The low rate of psychosis in the parents and relatives of autistic children has also been taken to point against genetic factors as the main cause.

The concept of brain damage is rather too general to be of help towards pinpointing a specific aetiology. However, the following arguments favour such a view:

1. A clinical picture hardly distinguishable from infantile autism may develop after overt brain disease, e.g. encephalitis when it occurs in infancy or early childhood.

2. The development of neurological abnormalities in some autistic children in later life, especially in adolescence.

3. The frequent abnormalities of perception and integration of sensory stimuli, suggest some cerebral dysfunction.

The factors that argue against the involvement of brain damage are:

1. In at least half the cases there is no evidence of brain damage.

2. All types of brain damage seen in autistic children can also be found in children without autistic features.

3. The perceptual, cognitive and language disabilities could be due to environmental factors like lack of stimulation and extreme isolation.

Psychogenic theories suggest that the child's abnormalities are seen as stemming from deviant parental behaviour or attitudes, particularly a prior disorder of personality in the mother who is unable to develop a warm relationship during the early weeks of life causing the basic disability - autism - from which the rest of the syndrome develops. Difficulties for this type of theory lie in the facts that most mothers of autistic children have normal children as well and that there is no scientific evidence to suggest that they have "colder" personalities than average. Also no case of childhood autism has been mentioned in the large literature on maternal deprivation or the effects of institutionalisation of children.

A number of theorists postulate an interaction between pathogenic
factors in the environment and a constitutionally vulnerable child (Boatman and Szurek, 1960, Mahler, 1952).

Although a few cases of successful behaviour therapy using operant conditioning techniques have been reported, the view that abnormalities of behaviour can be explained simply in terms of the subject's history of reinforcement seems too simple to explain adequately the symptomatology of childhood autism.

A great number of the psychological studies, referred to above, substantiate the view that autism develops as a response to language and other perceptual abnormalities. Recent reports stressed particularly a basic defect in appreciating order or pattern coupled with a tendency to impose stimulus-independent, simple, rigid and repetitive patterns on random as well as structured, meaningful input. This is seen as leading to a limited ability to appreciate meaning in language and the complex social rules which in turn is thought to lead to social withdrawal on the one hand and repetitive, manneristic behaviour on the other.
PART II: SCHIZOID PERSONALITY DISORDER

A. Clinical Aspects

Such children have been variously described as borderline states (Geleerd, 1958, Frijling-Schreuder, 1969) or as children with severe disturbances of ego-development (Weil, 1953) or even as benign cases of childhood psychosis (Mahler, 1949). Since this disorder is not so well known and not so clearly classified than cases of childhood autism a more detailed description will be given.

Wolff (1964) has described this condition most recently and the following description will be taken mainly from that source.

1. Description

Individual symptoms are often identical with those presented by children with reactive disturbances but psychotherapy and interpretations are usually not followed by amelioration of the symptoms and sometimes even lead to increased disorganization.

The children are mainly referred because of marked difficulty in social adjustment, particularly at school. They find it hard to make friends and to join in group activities. According to their mothers these personality difficulties extend from pre-school years. The parents are puzzled by their children and concerned because they do not really understand them. They see them as remote, lacking in feeling and solitary. Difficulty in adapting to new circumstances, negativism and obstinacy over particular issues for reasons the child never makes clear are other complaints. If pressure is applied temper tantrums follow.

Two distinct clinical groups can be discerned. In one, the children are withdraw and uncommunicative whilst in the other they are communicative, often of superior intelligence, but say that they feel different from other people. One boy in Wolff's sample put this very clearly: "I am an odd person, different from most people; I have different tastes. I like being by myself, it's my nature. I'm more fond of things than people. I see a lot of people with each other and I can't fit in. They have interests like fishing, pop records and I'm a square. I don't mind. It's other people who object. They are
nasty to me and I have to put up with it".

The communicative children revealed symbolic material with unusual freedom. Their talk was characterized by detachment, liberalness and much use of metaphor. When asked "Do you feel you are getting somewhere?" one boy replied: "I like travelling." This group of children lacked normal ego-defences, accepting interpretations too readily at times, becoming disorganized at others.

Despite their social difficulties and anxieties both groups of children had numerous interests which they pursued with unusual intensity. The communicative children, in addition, showed areas of extraordinary competence contrasting sharply with their often poor performance at school.

Such children have been described previously by Weil (1953) under the title of "Severe Disturbances of Ego Development". This faulty ego-development leads to marked deficiencies in the development of object relationships.

Clinically, three types of problem are in the foreground - social adaptation, manageability and neurotic-like symptoms. Practically all the children showed poor social, emotional adaptation. Some were extremely withdrawn and aloof; others showed indiscriminate outgoings. Among the problems of manageability Weil described extreme antagonism, temper tantrums out of proportion to cause and overimpulsiveness. Neurotic-like symptoms arise from an overload of tension and anxiety. Some children had anxiety in relation to changes in the environment or routine and fear of new things. Also an obsessional exclusiveness and limitation to one activity, one object or one preoccupation was detected.

Geleerd (1958) also has described such children as showing lack of tolerance to frustration, emotional immaturity, unevenness of development with uncontrollable id impulses, lack of social adaptation and a variety of neurotic symptoms. Geleerd found all her cases difficult to diagnose. They were in contact with reality and not delusional but when they were alone or when they felt frustrated they easily withdrew into fantasy life or had severe outbursts of temper.

A similar symptom cluster was described by Asperger (1943) and defined as "Autistische Psychopathie". This condition was found only in boys and seen as extreme variation of the male character, comprising
exaggerated intellectualism, odd originality and deformed emotionality. The last showed as a tendency to turn inwards to the self. Social isolation was regarded by Asperger as the main symptom. In these children normal childishness and playfulness gave way to earnest thoughtfulness and extreme introversion and prematurity. Intelligence was usually normal, occasionally better but rarely below normal. These boys often had poor motor but high verbal ability. Special abilities and interests were often highly developed in contrast to their general inability to benefit from schooling. They were often original, especially in the sense of odd-bizarre. They tended to store knowledge for knowing's sake or hoard objects registering everything with a well-developed rote memory without being able to comprehend logical connections or relationships. Their play activities were stereotyped and rigid. They tended to get lost in minute problems. For instance, Asperger described a boy who got into severe conflict while eating his soup. He could not stop watching the droplets of fat moving to and fro and joining and dividing. This had overpowering significance and problems for him.

In summary, Asperger, Weil, Geleerd and Wolff, all seem to describe a similar deviation of personality in children: schizoid personality disorder characterized by abnormal social relationships, strangeness and aloofness but with usually normal intelligence and speech development which, however, often shows odd metaphorical usage.

2. *Aetiology*

All writers see it as a constitutional deviation of personality, most even as hereditary or as Weil put it: "They have a heredity strongly tainted with open psychoses and/or pre-psychotic narcissistic and bizarre personalities. Wolff in most of her cases found one of the parents or a relative affected with similar schizoid personality traits.

3. *Prognosis*

The majority of the writers saw these children developing into odd, socially withdrawn personalities with a deficient personality structure who, nevertheless, managed to live an independent life.
B. Psychological Studies

No psychological investigations into aspects of the above disorder appear to have been described hitherto.

1. Purpose of Investigation

Since some aspects of the clinical description of schizoid children resemble features in the symptomatology of autistic children it was felt necessary as a first step to study schizoid children with psychological measures to try and determine how much schizoid children resemble or differ from autistic children on the one hand and normal children on the other.

2. Areas to be studied

(a) Intelligence: Characteristic subtest patterns have been found in autistic children using the Wechsler Intelligence Scale for Children (Wechsler, 1965; Kline, 1967; Lecky and Burton, 1970).

(b) Language disabilities: Using the Illinois Test of Psycholinguistic Abilities, Tubbs (1966) found that autistic children were significantly weaker overall than severely subnormal and normal children of similar mental abilities.

(c) Auditory Recall: By giving random words or sentence material in an immediate memory test O'Connor and Karmelin (1967) found that meaning was less appreciated by autistic than normal children. Any position effect was more marked in autistic children.

(d) Tendency to impose patterns: Frith (1970) had found that autistic children had a greater tendency than normal children to impose patterns in the spontaneous production of binary sequences.

(e) Analysis of the content of conceptual systems: The Flattening of Affect Measure (Dixon, 1968 and McPherson et al., 1970 a, b) has been used to determine the spontaneous use of constructs by asking subjects to describe differences between people in photographs. The answers were analyzed in terms of twelve categories which provided a quantifiable measure as to the relative frequency of use of construct sub-systems by the testee.

3. Outline of Study

Some of the cognitive and language studies mentioned above were taken...
PRESENT STUDY

1. Purpose of Investigation

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(d) Tendency to impose patterns: Frith (1970) had found that autistic children had a greater tendency than normal children to impose patterns in the spontaneous production of binary sequencies.

(e) Analysis of the content of conceptual systems: The Flattening of Affect Measure (Dixon, 1968 and McPherson et al, 1970 a, b) has been used to determine the spontaneous use of constructs by asking subjects to describe differences between people in photographs. The answers were analysed in terms of twelve categories which provided a quantifiable measure as to the relative frequency of use of construct subsystems by the testee.

3. Outline of Study

Some of the cognitive and language studies mentioned above were taken
as "guide lines" with the further purpose in mind to repeat these studies in a group of autistic children of higher mental abilities than the cross-section previously used. These cases were chosen so as to match a group of schizoid children.

A semi-structured interview was used to help towards optimal rapport between tester and testee as well as providing more clinical data and the investigator with further clinical experience.

To provide a quantifiable measure of the emotional uninvolvment described in schizoid as well as autistic children the Flattening of Affect Measure was applied. (Dixon 1968 & McPherson et al 1970 a, b). This has been used successfully to pinpoint and quantify flattening of affect of adult schizophrenic patients: when asked to describe differences between people in photographs, schizophrenics with the clinical signs of "flattening of affect" had been shown to make much less use of "psychological" constructs than did schizophrenics without affective flattening and normals; they did not differ in their use of several other categories of construct, such as those referring to the activities or physical features of the people.

A standard task of describing a person was given to investigate the language of the children as well as the kind of concepts they used when describing a person known to them.

4. Hypotheses

Because of the clinical similarities between schizoid and autistic children it was considered that the former might react to psychological tests in a similar manner though to a different degree than autistic children. Differences in test results would draw attention to any potentially important differences between the two groups.

It was thought that the present high grade, speaking autistic children would show the specific patterns of intellectual functions and language disabilities found by previous workers, though to a lesser extent. It was also thought that they would show greater awareness of sentence structure in auditory recall and consequently the effect of recency on recall would be less marked than in previous investigations.

Both groups were expected to use "psychological" constructs less often than "physical" ones.

18
A. Subjects

Seventeen schizoid and thirteen autistic children who could speak and who had an I.Q. of at least 70 had been diagnosed by Dr. Sulia Wolff. None of these children had any history of brain damage, though the possibility of minor degrees of brain damage can not be excluded. Individuals of each clinical class were matched for age, sex and intelligence to yield two groups of six boys and two girls.

A matching control group of normal children was then selected from the population of one primary and one secondary school of Edinburgh Corporation. The headmaster of each school was told the age, sex and level of intelligence required for each child, and that these children should not have attended any psychiatric clinic or have emotional problems as far as he was aware. Four of the children originally selected by the headmasters were found to have I.Q.'s in excess of that required and had to be replaced.

The three groups thus collected consisted of six boys and two girls each with a mean age of eleven years (range from five years ten months to sixteen years nought month) and a mean I.Q. of 89 (range 60 - 107). See Tables 1 and 2.

Table 1

<table>
<thead>
<tr>
<th>Activity</th>
<th>Schizoid</th>
<th>Autistic</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>89.5</td>
<td>86.3</td>
<td>91.4</td>
</tr>
<tr>
<td>Range</td>
<td>70 - 105</td>
<td>60 - 105</td>
<td>73 - 107</td>
</tr>
</tbody>
</table>
### Table 1

**Age of subjects in years and months**

<table>
<thead>
<tr>
<th></th>
<th>Autistic</th>
<th>Schizoid</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 - 7</td>
<td>6 - 3</td>
<td>6 - 3</td>
<td></td>
</tr>
<tr>
<td>11 - 5</td>
<td>11 - 2</td>
<td>11 - 4</td>
<td></td>
</tr>
<tr>
<td>11 - 11</td>
<td>12 - 7</td>
<td>12 - 5</td>
<td></td>
</tr>
<tr>
<td>12 - 4</td>
<td>12 - 8</td>
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<td></td>
</tr>
<tr>
<td>14 - 2</td>
<td>15 - 3</td>
<td>14 - 8</td>
<td></td>
</tr>
<tr>
<td>15 - 10</td>
<td>16 - 0</td>
<td>15 - 8</td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 - 10</td>
<td>6 - 4</td>
<td>5 - 9</td>
<td></td>
</tr>
<tr>
<td>9 - 10</td>
<td>8 - 2</td>
<td>9 - 5</td>
<td></td>
</tr>
<tr>
<td>Mean Age</td>
<td>11 -</td>
<td>11 -</td>
<td>11 -</td>
</tr>
<tr>
<td>Age Range</td>
<td>5 - 10 to</td>
<td>6 - 3 to 16</td>
<td>5 - 9 to 15 - 8</td>
</tr>
</tbody>
</table>

### Table 2

**Full WISC I.Q. for subjects**

<table>
<thead>
<tr>
<th></th>
<th>Autistic</th>
<th>Schizoid</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>74</td>
<td>73</td>
<td></td>
</tr>
<tr>
<td>76</td>
<td>72</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>88</td>
<td>101</td>
<td>106</td>
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</tr>
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<td>90</td>
<td>60</td>
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</tr>
<tr>
<td>91</td>
<td>90</td>
<td>98</td>
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<td></td>
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<td>107</td>
<td></td>
</tr>
<tr>
<td>105</td>
<td>105</td>
<td>91</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>89.5</td>
<td>86.3</td>
<td>91.4</td>
</tr>
<tr>
<td>Range</td>
<td>70 - 105</td>
<td>60 - 105</td>
<td>73 - 107</td>
</tr>
</tbody>
</table>

### Table 2 (a)

(See over)

20.
Table 2 (a)

<table>
<thead>
<tr>
<th>Verbal Scale I.Q.</th>
<th>Performance Scale I.Q.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Autistic</td>
</tr>
<tr>
<td>86</td>
<td>97</td>
</tr>
<tr>
<td>93</td>
<td>90</td>
</tr>
<tr>
<td>71</td>
<td>77</td>
</tr>
<tr>
<td>122</td>
<td>100</td>
</tr>
<tr>
<td>62</td>
<td>72</td>
</tr>
<tr>
<td>100</td>
<td>59</td>
</tr>
<tr>
<td>87</td>
<td>107</td>
</tr>
<tr>
<td>94</td>
<td>90</td>
</tr>
<tr>
<td>Mean 89.4</td>
<td>86.5</td>
</tr>
</tbody>
</table>

All t-tests between the three groups on the Full WISC I.Q. verbal and performance I.Q.'s were not significant. T tests within the three groups for differences between performance and verbal I.Q. were also not significant.

B. Procedure

Apart from four cases where letters were sent, the investigator was personally introduced to all autistic and schizoid children by their psychiatrist, Dr. Wolff. A brief explanation that I was interested to find out more about children with their kind of problem was given to the children and their parents. Each child was asked if it would like to participate in the investigation and none of the children or parents refused.

The control group and their parents were told about the study and asked for their co-operation as control subjects. None of the children or their parents refused. The investigator was introduced to each control child by its headmaster who made it clear to the child that the tasks and tests they were asked to do had nothing to do with their schoolwork and that he would not be told any of the results.

All subjects were tested individually on two occasions within an interval ranging from one to four weeks. Most interviews took place in
the Department of Psychological Medicine, but one autistic boy was tested at his residential school and one schizoid boy at home; two children from each of the schizoid and control groups were tested at their own school.

C. Tests and Tasks

They were administered in the following order:

1. Row of coloured chips
   (i) Material and administration
   As a "warm-up" task the subjects were asked to "Make a pretty row" from a mixed heap of coloured chips from the Merrill-Palmer Scale. The chips were of four colours - red, green, blue and yellow and supplied in sets of six of each colour. If a child asked if it could take any of the colours and as many chips as he liked this was confirmed. No other instructions were given.
   As soon as the child indicated that he had finished, the chips were mixed up and the task repeated twice more.
   (ii) Scoring procedure
   - Length of row: The number of coloured chips used for each row was counted and the mean for the three rows determined.
   - Perseverance with a colour:
     (a) A score was given where three or more chips of the same colour appeared in a row. Any further sequences were neglected in order to compensate for differing lengths of row, thus the score for each subject over three trials ranged from 0 - 3.
     (b) Any instance where all six chips of any colour were placed all together in a row was noted. The score ranged from 0 - 3.
   - Pattern: The appearance of a definite pattern throughout a row was noted. Only one break of pattern was allowed. The score for each subject again ranged from 0 - 3.

2. Wechsler Intelligence Scale for Children (WISC)
   (i) Material and administration
   The WISC was administered in the prescribed way according to the test manual (WISC Manual, 1949 and Manual for Scottish Standardisation, 1965). In two cases, one autistic and one schizoid boy, where it had
been given before within the previous year, it was not repeated.

(ii) Scoring
The scoring was also performed in the prescribed manner.

3. Taped Interview
It attempted to cover the same ground and in roughly the same sequence with all children regarding questions as to family, school life, friends, hobbies and interests. The interview questions cited in the Appendix were asked but these were regarded rather as starting points for the children to talk than as fixed structure. The interview was influenced very much by the child's circumstances and his ability and willingness to talk.

Since the material gathered varied considerably in amount and type, no analysis was undertaken for the present work. However, it may have influenced the subsequent relationship of the subjects with the interviewer and it was therefore thought necessary to discuss it briefly.

4. Description of Mother

(i) Material and administration
The children were asked to describe their mother with the following suggestion: "Now, I would like you to describe a person to me, a person you know well. How about describing your mother to me so that I would know her". The subject's answers were recorded on tape. When a subject stopped talking or indicated that he had finished, he would be urged one more time with the following words: "Could you tell me some more about your mother so that I would know her?"

All children described their mother except one boy from the control group who said that he did not have a mother and who volunteered to describe his father. His description was evaluated in the same way as those of the other subjects.

(ii) Scoring
The recordings were transcribed and scored by an independent judge according to the same principles as the following Flattening of Affect Measure (See Tests and Tasks Section 5)
5. Flattening of Affect Measure (Dixon, 1968, McPherson et al 1970 a, b)

(i) Material and administration

The test material consists of five pairs of photographs depicting people as the main feature. The pictures were chosen to give clear contrasts and differences within each pair.

The material was introduced with the following words: "I am going to show you some photographs of people. I shall give them to you in pairs and each time I want you to tell me all the differences you can see between the people in the two pictures". The children were not asked to concentrate on each pair for the full three minute period prescribed by Dixon (1968) as a pilot investigation with other children had shown that this was unbearably long. Instead, each child was urged once more on each pair of photographs when he stopped or said he had finished in the following way: "Could you see some more differences between the people in the two pictures?"

Each new pair of photographs was introduced in the prescribed manner: "Now, tell me all the differences you can see between the people in these two pictures".

The child's answers were recorded on tape and then transcribed.

(ii) Scoring

The transcriptions were analysed by an independent rater according to the following twelve categories.

Categories

A. Activity

Reference to what a person in the picture is doing, or has done, or is about to do.

Examples of responses scoring in this category:--

- carrying
- trying to think
- going to play
- has been baking
- looking at
- working

B. Background

Reference to anything in the picture other than the people or the clothes they are wearing.

Examples of responses scoring in this category:--
miner's lamp  background
brick wall  "towel" or "dress" hanging out of window (picture 1)
indoors  hat (in picture 4)
bread

c. Clothes
Reference to anything being worn by anyone in the pictures.
Examples of responses scoring in this category:-
jacket  their dress is different
watch  can't say one is dressed better than the other
finger stall

D. Denial
Indication that no (further) differences can be seen.
E.g. that's about all  that's the only difference
can't think of anything  no difference
else  that sums it up
not really much there

E. Emotion
References to the feelings, emotions or personality of the people in the pictures.
Examples of responses scoring in this category:-
happy picture  surly
stern  nervous
friendly game  aggression

G. Age
Direct reference to the age of people in the pictures.
Examples of responses scoring in this category:-
younger  not old
older woman  about 14 or 15
more of a grown-up
N. Nationality
Reference to the country of origin or race of people in the pictures.
Examples of responses scoring in this category:-
black man different country
commmonwealth person different colour
darkie same nationality

O. Occupation
Reference to the social, religious, occupational, intellectual
or economic status of the people in the photographs.
Examples of responses scoring in this category:-
preacher prosperous
comes from a poor home labouring type
middle class intellectual
intelligent can't see what their religion is

P. Physique
Reference to the physical characteristics of the people in the
pictures.
Examples of responses scoring in this category:-
finger broken grey hair
undernourished face like a man
stout robust

R. Irrelevance
Intrusion of irrelevant material of a delusional or personal nature.
Examples of responses scoring in this category:-
I'm not married
Do you go to church?
If Hitler thinks he can ....
I was supposed to have got out of here years ago
I'd stake my life it's my twin brother
They've run out of monkey-glands in Runwell ....
S. Stance

Reference to bodily pose:

- e.g. standing
- sitting
- leaning on
- lying down
- fist clenched
- arms clasped

X. Photography

Reference to the photography and materials used rather than the subject matter of the pictures.

Examples of responses scoring in this category:

- better pictures
- government photographs
- old-fashioned
- cellophane on this one
- facing the camera
- picture is posed

Only the first occurrence of each category was scored. Although the subjects were asked to give "differences" this did not matter for the rating. "Similarities" mentioned were equally eligible for analysis. No word or utterance could be assigned to any more than one category since the categories were designed to be mutually exclusive.

For each pair of photographs, each category was given a score of 1 if it was used and 0 if not. Thus each subject had a score for each category ranging from 0 - 5, and for all twelve categories together of 0 - 60. Each of the twelve single category scores was expressed as a percentage of the total score to indicate the relative use made of each category by the subject.

The above tests were administered during the first interview and the following measures during the second session.

6. Auditory Recall

(i) Material and administration

This task used material similar to that of O'Connor and Hermelin (1967) and followed their method. A word message was presented. Its length was twice each subject's individual memory span as determined by the WISC. Since the Digit Span over all the subjects ranged from 4 to 7, the word messages were between 8 and 14 words long. All the words used
were selected from Mein and O'Connor's (1960) vocabulary list, which gives frequency of occurrence of words in the language of severely subnormal subjects. All messages were matched for a mean word frequency of 60 - 65%.

Each child was presented with four examples for each of the four conditions set out in Table 3, i.e. sixteen messages.

### Table 3
**Examples of fourteen word messages**

<table>
<thead>
<tr>
<th>Random - random</th>
<th>Random - sentence</th>
<th>Sentence - random</th>
</tr>
</thead>
<tbody>
<tr>
<td>six wash spoon doll field last she way read they after</td>
<td>tomato church piano lot cowboy too paper - it is time for dinner now again</td>
<td>can you dig my long garden up - Teddybear show other bread hall field not</td>
</tr>
<tr>
<td>bird floor day</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Order of presentation was randomised and balanced between subjects. Presentation rate was at the speed of two words per second. The child was told: "I am going to say some words. Listen carefully and when I have finished repeat them right after me".

(ii) Each correct word recalled in the correct order gained a point. Scores were allotted to their appropriate halves of each arrangement, i.e. first or second half. The longest word messages (seven in each half) were scored directly. Scores from shorter word arrangements were converted to be equivalent with the longer series by multiplying each score by a factor of seven and dividing by the value of each subject's digit span, i.e. half the length of each subject's sequences.

**Material and administration**

The ITPA was administered in the prescribed way according to the test manual (Revised Edition 1968)

(i) The scoring was also performed in the prescribed manner.

Although the autistic children tended to arrange longer rows, this tendency is not significantly different from the other two groups, since t-tests proved not significant.

(Table 2)

(See over)
RESULTS

1. Row of coloured chips

Table 4

<table>
<thead>
<tr>
<th></th>
<th>Autistic</th>
<th>Schizoid</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.0</td>
<td>3.3</td>
<td>23.6</td>
<td></td>
</tr>
<tr>
<td>24.0</td>
<td>10.0</td>
<td>8.3</td>
<td></td>
</tr>
<tr>
<td>6.0</td>
<td>12.0</td>
<td>11.6</td>
<td></td>
</tr>
<tr>
<td>13.3</td>
<td>7.6</td>
<td>18.6</td>
<td></td>
</tr>
<tr>
<td>13.0</td>
<td>12.0</td>
<td>11.6</td>
<td></td>
</tr>
<tr>
<td>24.0</td>
<td>24.0</td>
<td>9.0</td>
<td></td>
</tr>
<tr>
<td>11.0</td>
<td>23.3</td>
<td>13.0</td>
<td></td>
</tr>
<tr>
<td>22.0</td>
<td>13.0</td>
<td>9.6</td>
<td></td>
</tr>
</tbody>
</table>

Mean 17.04 13.15 13.16

Although the autistic children tended to arrange longer rows, this tendency is not significantly different from the other two groups, since t-tests proved not significant.
Table 5

Perseverance with a colour
Use of a colour three or more times successively in a row

<table>
<thead>
<tr>
<th></th>
<th>Autistic</th>
<th>Schizoid</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
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<td>2</td>
</tr>
<tr>
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</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Mean 1.75 0.38 0.38

The autistic children showed a greater tendency to persevere with one colour than the other two groups (\( t = 2.75, df = 15, p < 0.02 \)). This is even more apparent from Table 6 which summarizes the instances where all six chips of any colour were placed together at once in a row.

Table 6

All counters of same colour used at once

<table>
<thead>
<tr>
<th></th>
<th>Autistic</th>
<th>Schizoid</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
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</tr>
<tr>
<td>3</td>
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<td>0</td>
<td>0</td>
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<tr>
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</tr>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

(See over)
Table 7
Occurrence of Pattern

<table>
<thead>
<tr>
<th></th>
<th>Autistic</th>
<th>Schizoid</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
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</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Mean 1.5 1.37 0.5

Significance level of t-tests:
- autistic vs control: p < 0.2
- schizoid vs control: p < 0.2

Both autistic and schizoid children show a greater tendency to develop definite patterns in their sequences than the control group. However, this trend is not statistically significant.

2. Wechsler Intelligence Scale for Children

Comparison between higher Wechsler Verbal Scale or Higher Performance Scale scores showed only a slight trend when differences of over ten points were taken into account. Higher Verbal than Performance scale scores occurred in both the control and in the autistic groups twice but not at all in the schizoid group. On the other hand, higher Performance than Verbal scale scores occurred in the autistic groups four times, i.e. in half the subjects, in the schizoid group three times and in the control group once.

The tendency of the autistic children to show greater variability, "scatter" in performance on the different subjects is more obvious when subtest means are considered.
### Table 8
WISC subtest means ranked in order of magnitude

<table>
<thead>
<tr>
<th></th>
<th>Autistic</th>
<th>Schizoid</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Verbal Subtests</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comprehension</td>
<td>5.75</td>
<td>6.13</td>
<td>8.13</td>
</tr>
<tr>
<td>Arithmetic</td>
<td>7.88</td>
<td>6.38</td>
<td>8.25</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>8.25</td>
<td>6.75</td>
<td>Information 8.63</td>
</tr>
<tr>
<td>Information</td>
<td>8.75</td>
<td>7.0</td>
<td>Comprehension 9.13</td>
</tr>
<tr>
<td>Digit Span</td>
<td>9.38</td>
<td>8.5</td>
<td>Vocabulary 9.63</td>
</tr>
<tr>
<td>Similarities</td>
<td>9.5</td>
<td>9.5</td>
<td>Digit Span 10.13</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>3.75</td>
<td>3.37</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Performance Subtests</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coding</td>
<td>7.13</td>
<td>Picture arrangements</td>
<td>6.75 Coding 8.38</td>
</tr>
<tr>
<td>Picture arrangements</td>
<td>7.75</td>
<td>Block Design 8.25</td>
<td>Picture Completion 8.5</td>
</tr>
<tr>
<td>Object Assembly</td>
<td>9.0</td>
<td>Coding 8.5</td>
<td>Block Design 8.63</td>
</tr>
<tr>
<td>Picture Completion</td>
<td>10.0</td>
<td>Picture Completion 8.75</td>
<td>Picture arrangements 8.75</td>
</tr>
<tr>
<td>Block Design</td>
<td>10.63</td>
<td>Object Assembly 9.25</td>
<td>Object Assembly 9.0</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>3.5</td>
<td>2.50</td>
<td>0.62</td>
</tr>
</tbody>
</table>

Both the autistic and the schizoid group show a much larger spread of abilities in both verbal and performance tests. In the rank order of the verbal subtests the schizoid children resemble the control group — apart from Digit Span.

### Table 9
(See over)
Table 9
Analysis of Variance on Wechsler Subtests

<table>
<thead>
<tr>
<th>Source</th>
<th>D.F.</th>
<th>S.S.</th>
<th>M.S.</th>
<th>F*</th>
<th>P*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal subtests</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between groups</td>
<td>2</td>
<td>61.93</td>
<td>30.97</td>
<td>0.90</td>
<td>n.s.</td>
</tr>
<tr>
<td>Between subtests</td>
<td>5</td>
<td>48.87</td>
<td>9.77</td>
<td>1.36</td>
<td>n.s.</td>
</tr>
<tr>
<td>Groups x subtests</td>
<td>(1) 10</td>
<td>122.99</td>
<td>12.30</td>
<td>1.71</td>
<td>n.s.</td>
</tr>
<tr>
<td>Between subjects</td>
<td>21</td>
<td>725.40</td>
<td>34.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>within groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residual</td>
<td>(11)105</td>
<td>755.98</td>
<td>7.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>143</td>
<td>1715.16</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Performance Subtests</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>2</td>
<td>7.27</td>
<td>3.63</td>
<td>0.15</td>
<td>n.s.</td>
</tr>
<tr>
<td>Between subtests</td>
<td>4</td>
<td>44.87</td>
<td>11.22</td>
<td>1.64</td>
<td>n.s.</td>
</tr>
<tr>
<td>Groups x subtests</td>
<td>(1) 8</td>
<td>54.73</td>
<td>6.84</td>
<td>1.00</td>
<td>n.s.</td>
</tr>
<tr>
<td>Between subjects</td>
<td>21</td>
<td>506.3</td>
<td>24.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>within groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residual</td>
<td>(9) 84</td>
<td>573.2</td>
<td>6.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>119</td>
<td>1186.37</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The above analyses of variance show that differences between subjects within groups were larger than any difference between groups or subtests or any interaction between these variables.

3. Description of Mother

Table 10
(See over)
<table>
<thead>
<tr>
<th>Categories</th>
<th>Groups</th>
<th>Significance level of t-tests</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Autistic</td>
<td>Schizoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>45.57</td>
<td>14.88</td>
</tr>
<tr>
<td>Clothes</td>
<td>8.71</td>
<td>23.0</td>
</tr>
<tr>
<td>Emotion</td>
<td>7.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Age</td>
<td>0.85</td>
<td>0</td>
</tr>
<tr>
<td>Occupation</td>
<td>6.14</td>
<td>7.13</td>
</tr>
<tr>
<td>Physique</td>
<td>8.43</td>
<td>36.0</td>
</tr>
<tr>
<td>Irrelevance</td>
<td>9.29</td>
<td>15.13</td>
</tr>
<tr>
<td>Repetition</td>
<td>14.0</td>
<td>3.0</td>
</tr>
</tbody>
</table>

It can be seen from Table 10 that the autistic children predominantly described maternal activity, the schizoid and control children the physical appearance. The schizoid children were much more concerned about the way their mother dressed than were the other two groups. Emotion, however, was not a feature of the response of any group.
4. Flattening of Affect Measure

Table 11
Mean Percentage Scores

<table>
<thead>
<tr>
<th>Categories</th>
<th>Groups</th>
<th>Significance level of t-tests</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Autistic</td>
<td>Schizoid</td>
</tr>
<tr>
<td>Activity</td>
<td>9.5</td>
<td>8.7</td>
</tr>
<tr>
<td>Clothes</td>
<td>10.5</td>
<td>16.13</td>
</tr>
<tr>
<td>Emotion</td>
<td>6.63</td>
<td>2.5</td>
</tr>
<tr>
<td>Age</td>
<td>3.88</td>
<td>7.63</td>
</tr>
<tr>
<td>Nationality</td>
<td>6.88</td>
<td>8.63</td>
</tr>
<tr>
<td>Occupation</td>
<td>1.13</td>
<td>0.88</td>
</tr>
<tr>
<td>Physique</td>
<td>11.0</td>
<td>14.13</td>
</tr>
<tr>
<td>Stance</td>
<td>7.5</td>
<td>6.63</td>
</tr>
<tr>
<td>Background</td>
<td>13.75</td>
<td>18.13</td>
</tr>
<tr>
<td>(Denial)</td>
<td>18.5</td>
<td>15.5</td>
</tr>
<tr>
<td>Irrelevance</td>
<td>9.38</td>
<td>0.63</td>
</tr>
<tr>
<td>Photography</td>
<td>2.38</td>
<td>0.75</td>
</tr>
</tbody>
</table>

\(^{1}\) c.f. 10 lower limit for "normal" adult value

\(^{1}\) Not appropriate in this study since Dixon and McPherson et al.

used the prescribed three minute period for each pair of pictures whereas in this study the presentation was ended when the child had indicated twice that it had finished.

The concern of the schizoid children with clothing was again apparent. The scores for "Emotion" in all groups were low compared with normal adults. This is particularly evident in both the schizoid and autistic groups but the latter, however, did not differ significantly from the controls.
5. Auditory Recall

The raw scores of the three groups of subjects on the verbal material was subjected to analysis of variances for positions in the arrangements, i.e. first of second half of message, and conditions, i.e. random or sentence material. A three-factor mixed design was used (Bruning and Kintz 1968).

<table>
<thead>
<tr>
<th>Source</th>
<th>D.F.</th>
<th>S.S.</th>
<th>M.S.</th>
<th>F.</th>
<th>P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>95</td>
<td>1585.22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between subjects</td>
<td>23</td>
<td>44.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between groups</td>
<td>2</td>
<td>8.55</td>
<td>4.28</td>
<td>2.52</td>
<td>0.1</td>
</tr>
<tr>
<td>Error b</td>
<td>21</td>
<td>35.64</td>
<td>1.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within subjects</td>
<td>72</td>
<td>1541.03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between conditions</td>
<td>1</td>
<td>118.90</td>
<td>118.90</td>
<td>91.27</td>
<td>0.001</td>
</tr>
<tr>
<td>Between positions</td>
<td>1</td>
<td>10.51</td>
<td>10.51</td>
<td>2.99</td>
<td>0.1</td>
</tr>
<tr>
<td>Group x condition</td>
<td>2</td>
<td>6.73</td>
<td>3.37</td>
<td>2.58</td>
<td>0.1</td>
</tr>
<tr>
<td>Group x position</td>
<td>2</td>
<td>2.92</td>
<td>1.46</td>
<td>0.42</td>
<td>n.s.</td>
</tr>
<tr>
<td>Conditions x position</td>
<td>1</td>
<td>4.13</td>
<td>4.13</td>
<td>&lt;  0</td>
<td></td>
</tr>
<tr>
<td>Group x position x condition</td>
<td>2</td>
<td>3.06</td>
<td>1.53</td>
<td>&lt;  0</td>
<td></td>
</tr>
<tr>
<td>Error 1</td>
<td>21</td>
<td>73.64</td>
<td>3.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error 2</td>
<td>21</td>
<td>27.36</td>
<td>1.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error 3</td>
<td>21</td>
<td>1293.76</td>
<td>61.61</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The main group term was not significant, only indicating a trend. The condition term is highly significant whereas the position term only showed a trend. Interaction of group by condition is indicated by a trend whereas no noteworthy interaction term either of group by position or condition by position was found. The group mean scores are presented in Figure 1.
All the groups show the effect of practice on memory as recall. This is most marked in the autistic children. Sequence or sentence scores are always lower than random scores. Using the t-test the difference is statistically significant in all groups ($p < 0.05$). However, this is less so in the autistic and schizoid groups than the control group. The random scores of all groups are similar but while the sentence scores for both autistic and schizoid groups are

**FIG. 1.**

*Auditory Recall: Random Words and Sentences.*
All the groups show the effect of position or recency on recall. This is most marked in the autistic children. Sequence or sentence scores are always better than random scores. Using the t-tests the difference is statistically significant in all groups ($p < 0.01$). However, this is less marked in the schizoid and autistic groups than the control group. The random scores of all groups are similar but while the sentence scores for both autistic and schizoid groups are practically the same, they both differ from the control group at the 0.02 level.

6. Illinois Test of Psycholinguist Abilities (ITPA)

Since the ITPA Standard Score Tables end at the ten years three months level and the children in the present investigation ranged up to sixteen years of age, raw scores were converted into standard scores according to the procedure used by Tubbs (1966).

Figure 2 shows the mean standard scores of each group on the different subtests.
FIG. 2.
Illinois Test of Psycholinguistic Abilities.

Test:
1. Auditory reception.
2. Visual reception.
3. Auditory association.
5. Verbal expression.
7. Grammatic closure.
8. Auditory memory.
11. Auditory closure.
12. Sound blending.

Group means:
- Autistic.
- Control.
- Schizoid.

A general inspection suggests that on post tests the control group received positive scores as did the autistic and the schizoid groups mainly because of regression effects. A 'mixed' design was used in this study.
A general inspection indicates that on most tests the control group received positive scores whereas the autistic and the schizoid groups mainly received negative scores.

A "mixed" design analysis of variance was carried out on the standard scores, with the results as shown in Table 13.

<table>
<thead>
<tr>
<th>Source</th>
<th>D.F.</th>
<th>S.S.</th>
<th>M.S.</th>
<th>F*</th>
<th>P*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td>2</td>
<td>1.4345</td>
<td>0.7173</td>
<td>1.75</td>
<td>n.s.</td>
</tr>
<tr>
<td>Tests</td>
<td>11</td>
<td>0.4146</td>
<td>0.0377</td>
<td>0.84</td>
<td>n.s.</td>
</tr>
<tr>
<td>Group x Tests</td>
<td>22</td>
<td>1.4205</td>
<td>0.0646</td>
<td>1.442</td>
<td>&lt; 0.1</td>
</tr>
<tr>
<td>BPWG</td>
<td>21</td>
<td>8.6062</td>
<td>0.4098</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residual</td>
<td>231</td>
<td>10.3441</td>
<td>0.4478</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>287</td>
<td>22.2200</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The main effects were not significant. There was indication of interaction of groups by tests. In order to discover what caused this interaction t-tests were carried out on each subtest. The only significant differences occurred on the following tests:

**Test 2: Visual Reception**

The autistic group performed significantly poorer than the control group (p < 0.05). A similar trend could be observed for the schizoid group.

**Test 4: Visual Association**

Both the autistic and schizoid groups received significantly poorer scores. (p < 0.05, p < 0.01 respectively).

**Test 10: Visual Closure**

The autistic children were significantly inferior to control children (p < 0.01).
DISCUSSION

For the comparative purposes of this study the requirement to match autistic children individually with schizoid children in respect of factors such as sex, age and intelligence imposed very severe selection pressures on the available material.

Schizoid children are usually of normal or better than normal intelligence (Asperger, 1943) whereas only about 30% of autistic children have an I.Q. of 70 or above (Rutter, 1966). A more recent study found that early onset of psychosis, in the first three years of life, was associated with a larger intellectual deficit than was later onset (Kolvin et al, 1971).

Furthermore, schizoid children are referred to a child guidance or psychiatric clinic mainly because of social difficulties at school (Wolff, 1964). Autistic children are presented because of lack of responsiveness or difficulty in learning to speak; they thus tend to be much younger than schizoid children when first diagnosed.

As a result the number of subjects in each group is small and the age range large. The latter must also have had a confounding effect on many between group differences since cognitive processes and strategies differ widely according to age as has been shown not only for normal children (Piaget, 1952, 1954) but also for autistic children (Frith, 1970; Hermelin and O'Connor, 1970).

Another weakness is that all the diagnoses were made by a single psychiatrist. Not all psychiatrists might agree with the diagnosis in individual cases or with the distinction between schizoid and autistic children since there are differences of opinion regarding the classification of mental disorders in childhood (Rutter, 1967; Rutter et al, 1969).

Despite these shortcomings there are indications of differential performance between schizoid, autistic and normal children with respect to the specific tasks employed.

Frith's (1970) method for the spontaneous arrangement of rows of coloured chips was used as a starting point for the investigation. Some of her results on the production and reproduction of colour sequences were confirmed. Both autistic and schizoid children made patterns of
colour according to rules of lawful sequence significantly more often than did normal children. Frith found that 75% of her autistic and subnormal children produced strictly regular patterns whilst 85% of normal children produced irregular patterns. She also found that both regular and irregular patterns could be described in terms of either alternation or perseveration. Comparing the frequency of each type of response she also found a significant difference with age; perseveration tendencies characterised younger children whilst alternation tendencies characterised the older ones. In the present work, despite the fact that the children were older, very few instances of alternation were found and no relationship to age was evident in any of the groups. This may be partly explained by the fact that Frith used only two colours which would lend themselves to alternation patterns whereas chips of four colours were used here. Thus the perseverence tendency of autistic children is even more forcefully demonstrated by these results.

In both the reproduction of colour sequences and recall of auditory patterns, Frith found that autistic children coupled a disability of feature extraction with tendencies to impose simple structures. She regarded this tendency to pattern imposition as an expression of strong internal factors with a characteristic stereotypy of rule application and speculated that this might explain some of the clinical findings in autistic children, namely the highly structured, rigid, repetitive, stereotyped spontaneous activity. The present finding that schizoid children tended to impose pattern or structure correlates with their tendencies towards repetitive and manneristic behaviour.

The application of the Wechsler Intelligence Scale for Children (WISC) repeated Lockyer and Rutter's (1970) work on the present autistic group but additionally provided information on the level and patterning of cognitive abilities in schizoid children.

The replication of previous findings was not totally successful, probably because of the small size and selectivity of the autistic sample but similar trends could be observed. More autistic children had a higher performance scale score than verbal scale score as was found by Lockyer and Rutter. The schizoid children showed the same tendency to
some extent. However, Lockyer and Rutter's parallel finding that the control children had higher verbal than performance scale scores was not corroborated.

The difference between the two experimental groups and the controls in their pattern of scores within the verbal and performance scales of the WISC is interesting although not as significant statistically as Lockyer and Rutter's. The small size of the sample and the fact that three groups rather than two were tested for significances are possible factors which would account for this. Both autistic and schizoid groups show a greater variability within subtest scores.

On the verbal subtests the high-grade autistic children tended to score relatively high on Digit Span and especially low on Comprehension, as had been found by several investigators (Lockyer and Rutter, 1970; Wile, 1967; Wassing, 1965). Surprisingly, they also scored high on Similarities. However, most of the children only passed on the first four items which is an opposite analogy test not requiring that amount of abstraction ability necessary for the later items where a superordinate class for two different items has to be found.

In the rank order of subtests the schizoid children resemble more the normal group—apart from Digit Span. This has a relatively high rank in the autistic and normal groups but has a lower rank in the Schizoid Group. According to Cohen's (1959) factor analytic study of the Wechsler scales, Digit Span is a pure measure of factor C, i.e. freedom from distractibility. Thus the schizoid group is more distractable than either the normal or autistic group, a finding which was corroborated by the results on the ITPA and auditory recall task.

On the performance subtests, the high-grade autistic group showed a pattern similar to that found by previous studies (op.cit) for less selected samples of autistic children; high scores on Object Assembly and Block Design combined with low scores on Coding and Picture Arrangement. However, the present autistic group also scored high on Picture Completion. Object Assembly and Block Design have high loadings on space performance ability and perceptual organization and least loading on the verbal factor. Both Block Design and Object Assembly require little in the way of compre-
hension of verbal instructions or the use of abstract concepts, sequential logic or symbolization. Picture Completion, on the other hand, requires some knowledge and appreciation of the more obvious aspects of familiar objects and situations of which the high-grade autistic children seem to possess more than the autistic children tested in previous studies.

These results may be linked to those of Hermelin and O'Connor (1970) who found great differences in the ability of speaking and non-speaking autistic children to solve tasks involving visual discrimination.

The schizoid children scored particularly badly on the Picture Arrangement subtest, a task which involves both an appreciation of a logical temporal sequence of events and an appraisal of social situations and interpersonal relationships. This is consistent with the clinical description of these children's difficulties in social relationships.

The Auditory Recall task was an attempt to repeat some of Hermelin and O'Connor's work (1967, 1970). They found that autistic children remembered at least as many randomly arranged words as did normals. Normal children always recalled sentences better than non-sentences regardless of the serial position of word groups but this was not the case for autistic children. In the latter, recency affected recall more significantly than the qualitative character of the verbal material.

The speaking autistic children of the present study showed an effect of recency on recall but to a lesser extent than those of Hermelin and O'Connor's children. They also had a correspondingly greater awareness of meaningful sequences but this was greatly inferior to that of normal children in whom recall is assisted by an awareness of the redundancies in language. The schizoid group resembled the autistic group in showing relatively little appreciation of order and meaningful structure. On the other hand, they showed no effect of recency on recall. Their relatively poor recall may be explained by their high distractability as demonstrated on the Digit Span subtest on the WISC.

The Illinois Test of Psycholinguistic Abilities (ITPA) produced far less significant results than obtained by Tubbs (1966) on three groups of children of much lower mental age using the experimental edition of the ITPA (1963). The revised edition was used in the present study and

45.
incorporates, among others, the following major changes:

1. The addition of three entirely new tests: Visual Closure, Auditory Closure and Sound Blending.

2. Two radically revised tests - : Grammatic Closure which is based on the Auditory-Vocal Automatic subtest and Visual Sequential Memory for which even the chips were redesigned to minimise possibilities of vocalisation.

3. The introduction of sampling procedures on the two sequential memory tests. These permit the appropriate level for each child to be ascertained rapidly, thus reducing the duration of the test.

4. The Visual Association Test is extended to include a section of visual analogies comparable to the auditory analogies in the Auditory Association Test.

5. There are fewer objects to manipulate.

In the present study no significant group and group by test interaction effects were found on analysis of variance but when the standard score means on the different subtests were compared, differential abilities between autistic, schizoid and normal groups became apparent. Generally the autistic and to a lesser extent also the schizoid groups are inferior in psycholinguistic abilities to the normal group. They are inferior on auditory as well as visual reception and association processes at the representational level. In the present high-grade autistic group the degree of disability in the auditory and visual modalities was similar whereas Tubb's group was particularly handicapped with verbal material. Surprisingly, the autistic group was best in verbal expression, a test in which the child handles an everyday object and describes it in as many ways as possible. However, this test does not penalise repetitiveness and irrationality which was evident from some of the autistic children's answers.

As in Tubb's work the autistic group had poor manual expressive ability. This test requires cross-modal coding since the stimulus is visual and the required response is a motor function or gesture. O'Connor and Hermelin (1965) have shown that cross-modal coding presents special difficulties for autistic children. Cross-modal coding ability is also
required in the verbal expression test and it is therefore surprising that the autistic group performed so well on this test.

In normal children it is thought that visually presented material tends to be stored in verbal form so that cross-modal coding is required between presentation and storage. Thus Tubbs has suggested that defects in cross-modal coding will also affect the visual memory test.

The same defect could also be taken to account for the significantly poorer performance of the present autistic than the other two groups in the additional Visual Closure test. In this test the children rapidly point out common objects in an incomplete visual presentation in pictures to which they are exposed for a limited period of time.

In the Grammatical Closure test the autistic and normal children were equally able to continue sentences with due regard to grammar, but the schizoid children performed poorly. This result accords with their relatively inferior performance in the Sound Blending, Auditory Closure and Visual Memory tests, all of which reflects a high level of distractability by which schizoid children may be characterized. The relatively good performance of autistic children, on the other hand, may simply be a reflection of the well-developed rote memory which characterizes the syndrome as well as their freedom from distractability.

The Flattening of Affect Measure, in which children described pairs of photographs of people has provided results of considerable potential importance. It was found that the remoteness and lack of feeling clinically evident in schizoid children and the tendency of autistic children to deal with people as though they were objects could be both identified and to some extent quantified.

In all three groups relatively little reference was made to the feelings, personality and emotions expressed by the people in the photographs compared to adults. In a series of studies using the repertory grid technique Little (1968) found that children nine to eleven years of age used physical constructs more frequently than psychological or those referring to the roles of people. The use of psychological and role constructs increased between ten and eighteen years but only exceeded the use of physical constructs in late adolescence. Brierley (1967) also
found personality and behaviour constructs to increase with age. She elicited constructs from ninety boys and girls at ages seven, ten and thirteen. Overall, at seven years children were using kinship and social role constructs, at ten years appearance and behaviour constructs and at thirteen years, personality constructs. A breakdown into sex groups showed that girls used notably more personality constructs than boys. The present finding that children referred mainly to the physical attributes of their mother or the people in the photographs is thus consistent with Little's and Brierley's results.

The observations that schizoid children used the emotion category significantly less than normal children whilst the autistic group showed only a trend in that direction should be considered in the context of the findings and theories of Hermelin and O'Connor (1970), i.e. the lack of adequate social and interpersonal behaviour in autistic children is seen as a secondary symptom arising from a basic cognitive defect. This defect comprises a lack of feature extraction coupled with a tendency to impose simple repetitive patterns.

Such detailed investigation of schizoid children has not yet been reported but these preliminary observations have failed to reveal any gross cognitive or perceptual defects. Thus lack of emotional involvement must still be regarded as the main symptom of the schizoid personality.

The schizoid child's concern with clothes rather than people's personality and with the background of the pictures as revealed by the Flattening of Affect Measure accords with the findings of McPherson et al (1971) using the Bannister-Fransella test. The more severely thought disordered patients in the study were also more concerned with clothing and background objects than with the people in the pictures; they showed more inconsistency and loosening of their construct systems.

In both the autistic and schizoid groups certain aspects of the clinical description can be correlated with the Flattening of Affect Measure and Description of Mother. These tasks can be used to some extent to investigate the conceptual systems of the children by permitting examination of the differential use of construct systems. Autistic children tended to make more irrelevant statements and remarks on
photography in the Flattening of Affect Measure. In the Description of Mother they also used a great deal of repetition — a feature not brought out by the former test in which only the first occurrence of any category was scored. However, the schizoid group also made some irrelevant remarks while describing their mother.

Conclusions and suggestions for further work

This study of cognitive and language abilities and the conceptual systems in groups of schizoid, high-grade, speaking autistic and normal children has shown that the schizoid personality disorder comprises a group of children distinct from autistic on the one hand and normal on the other.

In addition it was found that this selected autistic group still showed some of the peculiarities of cognitive, language and memory function which have been described in autistic children by previous investigators. However, the specific pattern of abilities and language deficits as well as the especial deficit in feature recognition with its related tendency to impose endogenous patterns was less marked than in other studies where broader cross-sections of the autistic population have been investigated.

Despite being matched with respect to I.Q. the schizoid children showed a greater spread in intellectual ability than the normal group. In all the cognitive, language and memory tests they were less co-operative, and less motivated towards achievement. In other words they were more distractable. In language function especially at the representational level and in the process of reception and association they showed similar disabilities to the autistic group though to a lesser extent.

It would be valuable to investigate these aspects of the schizoid personality disorder more fully using larger groups of children and applying vigilance tests, and tests of endurance and persistence in intellectual tasks such as, e.g. the Nufferno Speed and Level Tests. In addition it would be useful to measure the speed and degree of reactive inhibition accumulating on simple motor tasks such as tracking a revolving disc.

The emotional uninvolvment of schizoid children revealed by the
Flattening of Affect Measure was more marked than that of the autistic group. It would be of particular interest to study this aspect more fully in a larger group of schizoid children. Furthermore, it is important to determine whether the combination of the Flattening of Affect Measure and Bannister-Fransella tests would reveal correlating looseness and inconsistency in the use of psychological constructs similar to those found in adult schizophrenics (McPherson and Buckley 1970; McPherson et al 1971).


REFERENCES


51.


Mahler, M.S. (1949) "Clinical Studies in Benign and Malignant Cases of Childhood Psychoses". Am. J. Orthopsychiat. XIX.

Mahler, M.S. (1952) "On child psychosis and schizophrenia: autistic and symbiotic infantile psychoses". Psychoanal. Study Child, 7, 286 - 305.


Rimland, B. (1964) Infantile Autism, Appleton-Century-Crofts, N.Y.


APPENDIX

Interview Questions

How old are you?
Do you have any brothers or sisters?
What is his/her name?
How old is he/she?
What does he/she do?
Who else lives in the house with you?
How do you get on with them?
What school do you go to?
Do you like it?
Tell me all about it.
What are your favourite subjects?
What are the subjects you do not like?
What do you do in your spare time (when you come home from school)?
Do you have a hobby?
Do you like reading?
What sort of books do you read?
Do you play an instrument?
Do you practise any sport?
Are you a member of a club?
What do you want to do when you leave school?