

CALIFORNIA STATE UNIVERSITY, NORTHRIDGE

EARLY INFANTILE AUTISM

A Language Disorder

A thesis submitted in partial satisfaction of the
requirements for the degree of Master of Arts in

Educational Psychology

by

Lothar Von Schoenborn

June, 1973

The thesis of Lothar Von Schoenborn is approved:

California State University, Northridge

June, 1973

ACKNOWLEDGMENTS

I would like to take this opportunity to express my appreciation to the many individuals who generously gave of their time and effort to this research project.

I am particularly indebted to members of my committee for their help and interest during the development and execution of the study. A special debt of thanks is due to Dr. McCafferty, Chairman of the committee, for his guidance and support.

I am also grateful to Dr. Bishop and her staff at Camarillo State Hospital for their encouragement and advice when it was needed.

TABLE OF CONTENTS

	Page
APPROVAL PAGE	ii
ACKNOWLEDGMENTS	iii
ABSTRACT	v
INTRODUCTION	1
Statement of the Problem	3
Statement of Purpose	4
REVIEW OF THE AUTISTIC LITERATURE	6
SUMMARY OF THE DIAGNOSTIC CRITERIA	11
REVIEW OF THE LITERATURE DEALING WITH AUTISTIC SPEECH	14
AUTISM AS A LANGUAGE DISORDER	21
SUMMARY OF THE DISCUSSION	32
IMPLICATIONS FOR PRESCHOOL PROGRAMS	34
REFERENCES	38

ABSTRACT

EARLY INFANTILE AUTISM

A Language Disorder

by

Lothar Von Schoenborn

Master of Arts in Educational Psychology

June, 1973

Kanner described eleven children suffering from a syndrome which he called, "early infantile autism." These children were characterized by an inability to relate themselves to others, failure to develop speech, rote memories and ritualistic, compulsive and stereotyped behavior. Since that description three distinct positions have surfaced--autism viewed as a psychogenic, a neurological, or a behavior disorder. Due to these theoretical differences, little agreement exists as to diagnosis, etiology, and treatment.

All writers have commented on the speech disorders but see them as only one aspect of a larger and more complex syndrome. They have noted that meaningful

communicative speech is the best prognosis for subsequent recovery. It is the contention of this paper that such children suffer from a central language disorder. The communication problem does not reside only in impaired speech but also in a disturbance of language--the ability to encode-decode sense experiences and extrapolate from recurrent relevant stimulus a common pattern or rule.

Recent developments in psycholinguistics make such a hypothesis attractive in explaining and integrating the major features of autism: impairments of relationships, communication and appropriate object use. The autistic child faces the problem of language learning, that is, of mastering a symbolic code. Evidence and arguments are presented in support of the view.

EARLY INFANTILE AUTISM

A Language Disorder

Lothar Von Schoenborn

California State University, Northridge

INTRODUCTION

Three decades have passed since Kanner (1943) published his paper describing an unusual behavior disorder in children which he called, "early infantile autism." The strange pattern of behavior, the display in the same child of characteristics typical of both the gifted and the retarded, as well as the seeming absence of evidence of physical or neurological defects have led many researchers to consider the autistic syndrome to be the most bewildering of all behavior disorders.

There is no known cause and no known cure. Recovery, in the few reported cases where it has occurred, has apparently been spontaneous. Among the few who have recovered, several were afflicted so severely that they functioned at the idiot or imbecile level during early childhood (Rimland, 1964).

During the last ten years a voluminous literature has developed, not only in psychology or psychiatry as one would expect but in a number of other fields--pharmacology, genetics, neurology, linguistics--not usually associated with the helping professions. Despite this expenditure of time and energy little agreement exists among clinicians as to diagnosis, etiology and treatment. The only area of agreement is the frequency of cases. Kanner (1956) whose clinic at Johns Hopkins was a "clearing house" has seen only 100 cases in seventeen years. Wing (1966) and Rutter (1971) estimate that there are only about four cases per 10,000 population. This low ratio has led Kugelmass (1970) to question the continued expenditure of effort on a disorder that has been studied and debated far out of proportion to both its frequency and inclusiveness of cases.

Yet, autism stands as a paradigm for unsolved problems in child psychology. It raises issues of diagnosis, classification, etiology and, ultimately, treatment. Clinicians have long been fascinated with the bewildering aspects of the disorder and with the hope of unravelling its mystery. This fascination can best be seen in Itard's (1962) description of the wild boy of Aveyron.

In the following chapters evidence and arguments

are presented in the hope of solving at least a part of the mystery by conceptualizing autism in new terms, relating and integrating established theories and offering a program of treatment.

Statement of the Problem

Since Kanner all writers have commented on the speech disorder of autistic children but they have seen it as only one aspect of a larger and more complex syndrome. In addition they noted that meaningful communicative speech by age five is the best prognosticator for clinical recovery. Yet, few have focused on the communication impairment per se. Behavior psychologists, mindful of the prognosticative value of speech, focused their attention on attempts to elicit "speech" (Lovaas, 1966).

The laboratory techniques developed by behaviorists have been extended into limited environments in the hope of teaching autistic children speech. These programs have validated experimental findings that mute autistic children are capable of speech production, learning words and phrases, and repeating them on demand. However, such words and phrases were rarely used to initiate or respond to meaningful communication. Children who received instruction developed the same speech patterns as those who were

verbal without instruction. It is safe to conclude that attempts to teach words or phrases per se in the hope of developing language have failed. There is no evidence, not even from well controlled behavior experiments, to indicate that words will generate the language process.

Most writers tend to use the terms "speech" and "language" interchangeably. For the purposes of this paper, "language" will mean the system of symbols and "speech" will mean the verbal manifestation of language. Since all "cured" children have language, efforts at stimulating the language process should be the focus of attention. It is not just because of its prognosticative value, but because language permits a child to order and code his sense perceptions, to continue in the socialization process and to benefit from formal education. In this fashion he develops skills needed to become a functioning adult.

Statement of Purpose

The major contention of this paper is that children with a diagnosis of early infantile autism suffer from a complex syndrome; the paramount feature of this syndrome is a central language disorder. This disorder may reside in the encoding-decoding process or in the rule-extrapolation

process. The disorder may be the sufficient cause to characterize a child as autistic. Recent developments in psycholinguistic theory and research gives credibility to this contention. At present such a hypothesis is the best way of explaining and integrating the major features of autism: impairments of relationships, communication and appropriate object use. This is not to imply unitary etiology. Nor does it imply that a central language disorder is the only defect in such children.

The mute or marginally verbal autistic child faces the problem of language learning, that is, of mastering a symbolic code. Since speech is the product of language, the focus of any preschool intervention program must be the pre-verbal language process. The purpose of this paper was to examine certain experimental evidence and arguments which support this view.

REVIEW OF THE AUTISTIC LITERATURE

Several excellent discussions of diagnostic criteria of early infantile autism are available (Rimland, 1964; Wing, 1966; Rutter, 1971). Much of the work of clinicians is concerned with a description of the condition and differential diagnosis. For example, the diagnostic separation of children into the aphasic and the autistic sometimes seems to be more a matter of whether the parents are first referred to neurologist or a psychiatrist. Since little agreement exists, the purpose of this chapter is to summarize the diverse findings from clinical and social psychiatry.

Kanner (1943) originally described eleven children characterized by an inability to relate themselves to other people ("extreme autistic aloneness"), a delay in the acquisition of speech, together with abnormalities of language, an excellent rote memory and an apparently obsessive desire for the maintenance of sameness. Kanner emphasized that the condition was first manifest in early infancy and in this respect autism was different from childhood schizophrenia. He noted that the diagnosis for

early infantile autism should be restricted to children who show all of the symptoms. Kanner's definition specifically excludes physical and neurological damage, but symptoms of autism are accompanied by some indication of central nervous system disorders in up to one half of the cases (Rimland, 1964; Rutter, 1966).

Since that first description of the syndrome, many researchers have reported finding children suffering from this disorder. However, they differ in the criteria for diagnosis. Some writers have attempted to "objectify" the criteria. Creak (1961) developed nine points by which to differentiate autism from other childhood disorders, although she later (Creak, 1964) noted that some of the points failed to differentiate groups to any appreciable extent and others proved to be ambiguously stated. Rimland (1964) developed a questionnaire dealing with clinical observations and family history. Rutter (1966) compared the symptomatology of children diagnosed by experienced clinicians as suffering from "infantile psychosis" (autism and childhood schizophrenia) with that of children of the same age, sex, and IQ level but who suffered from other psychiatric disorders. The pattern of symptoms in the two groups was different with some overlap. No single symptom

occurred in all the psychotic children.

Grossly abnormal behavior frequently exists in the apparent absence of obvious neurophysiological defects, and because of this many investigators have taken the cause of autism to be psychogenic. Bettelheim (1967) sees the syndrome primarily as an impairment of the mother-child relationship. Kugelmass (1970) and Kolvin (1971) view autism as an inability on the part of the child to form any self-concept. For this group autism as a symptom is manifested in aloofness, distance and apparent lack of interest in other people, failure to join in group play, the avoidance of eye-to-eye contact, little variation in facial expression, infrequent exhibition of emotion or humor, and a relative lack of sympathy or empathy for other people. The ritualistic and compulsive phenomena consist of a morbid attachment to unusual objects, peculiar preoccupations, and a resistance to changes of any kind. For those who see autism in psychogenic terms, the focus of their attention and therapy has been on withdrawal behavior.

Rimland (1964), Browne (1965), Himwich (1972), and others are more inclined to concentrate on the physiological aspects of the disorder. They note unusual electroencephalogram records (EEG), accumulation of abnormal

methyated compounds with hallucinogenic properties, high concentrations of lead in the blood stream and endocrine metabolic disturbance. These may result in a delay in maturation or a disfunction of the central nervous system (CNS) and may cause complex motor and special sensory problems. In addition, the presence of these compounds may be responsible for distinct delays in physical, personality and language development. This group sees autism essentially as a chemical imbalance and uses drug and vitamin therapy to treat the disorder.

Lovaas (1971), Hewett (1965), Churchill (1972), and others focus on the behavior of autistic children. Behavioral psychologists have replicated animal experiments at the human level and have extended their findings about basic human processes to autism. The focus of their attention and treatment is with the maladaptive behavior (disorders of speech, ritualistic and stereotyped behavior and self-injury) directly, rather than with underlying events. Behavior modification techniques are used to shape desired behavior.

As has been noted, Kanner's definition specifically excludes neurophysiological damage and insists that all symptoms be present. Kolvin (1971) sees little value in an

all-inclusive classification system and notes that symptoms of autism are accompanied by some indications of central nervous system damage in up to one half of the cases. Others view autism on a continuum placing the moderately disturbed on one end and the severely disturbed on the other. The defects of this classification system are obvious. Kolvin (1971) suggests that autism be viewed in terms of "primary and secondary characteristics." That is to say, certain central symptoms must be present to warrant the label of autism. Secondary symptoms while not necessary would generally be present in various combinations. In this fashion one can account for the distinct "style" each child uses to exhibit the syndrome.

SUMMARY OF THE DIAGNOSTIC CRITERIA

For the purpose of this paper the major features of infantile autism are grouped into four categories without concern for etiology: (1) impairments of relationships, (2) communication, (3) appropriate object use, and (4) other impairments.

Impairment of Relationships

This category includes withdrawal, aloofness, distance, lack of interest in people, failure to join group play, avoidance of eye contact, little variation in facial expression, infrequent exhibition of emotions or humor, lack of sympathy or empathy for others, lack of warmth or affection, unawareness of personal identity, delays in personality development.

Impairment of Communication

This category includes mute, delayed and retarded speech development, pronominal reversal, delayed and immediate echolalia, lack of response to sound, metaphorical phrases, whole-part confusion, concrete use of speech, creates own words, use of special voices and tones,

disorganized speech.

Impairment of Appropriate Object Use

Under this category are included the following: no interest in surroundings, resistance to change or maintains sameness, ritualistic, compulsive and stereotype behavior, problems in right-left, up-down and back-front orientation.

Other Impairments

Other impairments include feeding and sleeping difficulties, anxiety and fears, lack of response to painful stimuli, short attention span, enuresis and encopresis (after age four), aggression, temper tantrums, self-stimulating, hyperactive, self-destructive, delays in physical development.

Much of the work of clinicians has been concerned with a description of the syndrome and a discussion of etiology. Three distinct positions have surfaced--autism viewed as a psychogenic, neurological, or behavioral disorder. Most writing on the subject deals with differential diagnosis, age of onset, family case histories, prevalence, prognosis and treatment. The only problem settled is that of prevalence. Age of onset has been

determined largely by definition and by differentiation from childhood schizophrenia. Major disagreements deal with three aspects of the disorder:

1. What characteristics are sufficient to warrant the label of autism?
2. What is the etiology of the disorder?
3. What treatment programs will best facilitate clinical recovery?

REVIEW OF THE LITERATURE DEALING WITH
AUTISTIC SPEECH

In reviewing the autistic literature it is best to imagine a continuum ranging from highly controlled laboratory experiments at one end, to a search for means of controlling complex human behavior in the natural environment of subjects on the other. That is to say, certain principles can be discovered in the laboratory over simple and basic processes. Gradually the analysis can be extended into more and more complex situations and interactions with "real life."

Unfortunately, no orderly work has proceeded along the continuum but has emerged unevenly at different points. This fact not only robs the autistic literature of a sense of order, but has sparked much disagreement. Laboratory researchers view the work in limited and natural environments as uncontrolled, irresponsible "fooling around" (Yates, 1970).

Pronovost (1961) conducted a study of the speech and language comprehension of twelve autistic children who were observed over a two-year period in a residential

setting. He obtained speech samples from tape recordings of patients and subjected them to analysis. There was a wide range of inter- and intra-subject variation in speech behavior, babbling, echolalia, repetition of unidentifiable sounds and a rote repetition of number sequences or scraps of songs. He first pointed out the similarities in the speech of autistic and aphasic children.

Cunningham and Dixon (1961) observed the speech behavior of autistic children and conducted qualitative and quantitative analysis of the data in accordance with the functional classification schema of Piaget. Despite some resemblance of the autistic children's speech to that of normal children, they noted a markedly lower level of development in certain quantitative respects (length of utterance, variety of words, etc.) and in many qualitative respects (monotony, frequency of incomplete sentences, rarity with which questions were asked and information given).

Wolff and Chess (1966) conducted a study of speech behavior with certain innovations. The diagnosis was based on the independent judgments of two psychiatrists. They presented criteria for the selection of subjects. Information on speech behavior was collected from two

sources: interviews with mothers and direct observation of the child's speech behavior. The children were rank ordered in severity of illness. The authors reported significant correlations between the severity of the syndrome and three verbal categories: total number of words, total number of words corrected for length, and average length of utterance.

Rutter (1968), citing his longitudinal study at Maudsley Hospital, went so far as to state that speech abnormalities are perhaps the most characteristic of all manifestations of child psychosis, and an aphasic-type disorder is probably a central element in the development of many cases of autism.

Wing (1966) noted that the autistic child is handicapped by a basic inability to integrate visual and auditory experiences into the meaningful patterns which form a basis for the normal child's developing understanding of the words. Other writers on the speech behavior of psychotic children tended to group autistic children with those suffering from childhood schizophrenia, Down's and Heller's syndromes and other childhood disorders. These early studies on speech disorders were primarily descriptive and speculative in nature.

Several investigators (Hewett, 1965; Lovaas, 1966) reported success in establishing speech in previously mute autistic children through the use of operant conditioning procedures. Lovaas (1966) reported a study involving two autistic children who were both limited to echolalic behavior prior to the project. Using a reinforcement paradigm they were able to extinguish the children's echolalia. In addition the children learned upper and lower case alphabet, they learned to read one simple book, and they could verbalize descriptions of objects and actions seen in magazines and books. The results were not only impressive in themselves but indicated that autistic children were capable of normal speech.

Finally, Hermelin and O'Connor (1970) conducted systematic experiments comparing groups of autistic children and other types of children with respect to receptive, integrative and expressive abilities. They found the pattern of their cognitive abilities deficient in verbal skills even on tests which do not require speech. Furthermore, this pattern of abilities was associated with the child's lack of language development. It appeared that the failure to speak was due to a basic impairment in language skills--not to an absence of motivation to speak. The

autistic child was not only retarded in speech but also in his "pattern" of linguistic abilities, which was significantly different from that exhibited by either normal or mentally retarded children. Finally, a series of experiments concerning coding and immediate recall showed that autistic children make little use of concepts in memorizing --the verbal recall of autistic children was found to be relatively independent of the "meaning" of what they had heard.

DeMyer (1971) noted systematic differences between performance and language subtest scores on standardized intelligence tests given autistic children with language scores being much poorer than performance scores. Churchill (1971) used an experimental nine word language utilizing operant conditioning techniques to systematically test processes which subserve the language function. He tested specific sensory modalities using programs of increasing complexity. Churchill (1971), in his review of his own findings and that of others, noted the similarities between autistic and aphasic children in test results and in error patterns. In addition, he noted that such children can be taught language "performance" (speech) but not language "competence" (language).

Hermelin (1971), Frith (1970, 1972) and Churchill (1972) have carried the issue much further. They have shown that compared with normal and subnormal children of the same mental age, autistic children are not only impaired in their ability to deal with the grammatical structures of language but they lack the ability to associate words semantically. However, this defect is not confined to auditory material. Autistic children also have difficulties in perceiving temporal patterns in visually presented stimuli which suggests a central defect in the processing of perceiving, coding, and arranging stimuli in meaningful patterns.

Summary

Only about one half of all autistic children have speech. This speech is characterized by echolalia, pronominal reversal, literalness, metaphoric usage, part-whole confusion and other features. Most of the early studies were descriptive and sought to differentiate the speech of autistic children from the speech of those who suffer from other childhood disorders. Lovaas (1966) showed that mute autistic children could be taught speech. Recent studies indicate that autistic children suffer from language deprivation. Even after "speech" production difficulties

were corrected children still did not enter into meaningful communication. Researchers have concluded that the loci of the language problem might reside in the coding-encoding process.

AUTISM AS A LANGUAGE DISORDER

The sequence of speech and language development in normal children is well documented. However, the question of how language is acquired is still a controversial one. Present language models are based on neurological, behavioral, social learning theories, or various combinations. In this chapter current language models will be analyzed with special emphasis placed on those features that relate to various aspects of the autistic syndrome.

Although Hebb (1949) does not focus on speech or language per se, his neuropsychological theory has been incorporated by a number of language theorists and other aspects of his theory have special application to autistic children. Hebb views the brain as the terminal receptor of the central nervous system. His concern is with the problem-solving capacity of the organism. Language is important as one tool in that process. Hebb sees the infantile brain developing a diffuse structure ("cell assembly") in the cortex, the diencephalon, and in the basal ganglia of the cerebrum. These cells are capable of acting briefly as a closed system or as a switching device

("firing systems") to facilitate delivery to other such systems impulses to or through the motor area. Each firing action may be aroused by a preceding assembly, by a sensory event, or by both.

These firing systems may be viewed as another way of expressing the idea that the interim regions of the cerebrum must be properly programmed by preverbal motor experiences if the human organism is to function effectively as a problem-solver. Hebb views most "primary learning" to be based upon early motor and sensory experiences. The importance of these early perceptual experiences increases as one goes up the phylogenetic scale as the portion of the brain without direct connection to sensory input or motor outlets increases relative to the portion which does have direct sensory and motor connection. These experiences are needed for the formation of deoxyribonucleic acid (DNA) and ribonucleic acid (RNA). DNA is a self-firing system responsible for the implementing of gene controlled functions. RNA can be fired only through stimulation and is believed responsible for information storage.

The application of Hebb's model brings into sharp focus the importance of active interaction with the environment. Children restrained because of behavior

abnormalities lose these critical motor and perceptual experiences, causing an insufficient development in the "firing and storage systems" that facilitate future problem solving.

Skinner's (1957) position is well known and has the advantage of being consistent and integrated with other types of behavior theories. He sees the understanding of verbal behavior tied to external stimuli and the history of reinforcement. The force of his arguments lies in the enormous wealth and range of examples for which he proposes a functional analysis. However, Skinner's theory fails to account for a number of aspects of language, such as semantics and grammar. The inability of such notions as "stimulus," "response," and "reinforcement" to explain higher mental processes within a behavior paradigm has caused some writers to open the S-R process and develop "mediating processes."

Osgood (1957, 1963) accepts Hebb's neurological theory and builds a behavior language model containing two stages--the encoding and decoding process. The encoding process deals with physical energies in the environment and the organism's ability to perceive and integrate stimuli. The decoding process deals with the response of

the organism to stimuli and hence is turned again into environmental energy. The encoding-decoding process passes through any of three levels of organization--the projection, integration, and representation levels--depending on the complexity of the stimuli. The projective level relates receptor and muscle events to the brain via a "neural mechanism" (sensory receptors). At the integration level the organism sequences and organizes incoming and outgoing stimuli through patterning, ordering, pairing, and closure. At the representation level the organism terminates the encoding operation and initiates the decoding pattern through semantic and grammatical phases. Language, as the term is used in this paper, must be present at the integration and representational levels. Speech need not be present. Using this model, speech acquisition is only one aspect of general cognitive development. Channels other than the auditory-vocal could be used for the encoding-decoding process. For example, mute and deaf children develop language as long as their cognitive functions remain intact.

Chomsky (1968) and Lenneberg (1964, 1967) accept the theory that language development has a biological understructure and focus their attention on the

representational level. In their models the assigning of meaning to a word is thought to proceed along lines analogous to a binary, hierarchical computer operation; it depends on the identification and reidentification of stimuli. The incoming stimuli is compared to the previously stored data on a match-mismatch basis. Whenever input received does not match the stored encoding pattern, a further encoding operation is required. This operation depends on two major processes: (1) perception of the varied stimuli and (2) the selection of a subset of dimensions representing the recurrent relevant common pattern in the incoming message.

Beyond the description of the language process, Chomsky (1957) sees a generative grammar which is an attempt to explain why the native speaker is able to understand and produce sentences that may never have been written nor spoken before. Chomsky's basic assumption is that language is a system of rules which can be arranged to form and understand new sentences. Knowledge of a language is based on the intuitive mastery of the rules. Transformational grammar seeks to understand the relation of language and thought. It is a combined product of linguistic structure and psychological processes within the

speaker.

For the autistic child a breakdown in the linguistic process can occur at any point. There might be an impairment in scanning the stimuli, so that with each encounter a new coding process would occur. In other words, there would be a failure of recognition. Or a deficit might arise from too much stimuli being coded as a defining set for a label. This would lead to too many objects or events being represented by a given word. Finally, there could be an inability to make correct "match-mismatch" decisions, so that an object or event would be assigned a category having an inappropriate label.

Linguists have observed that the early stage of language development (babbling) is cross-cultural in nature as to the time of onset and type. However, the next developmental stage (echolalia) is the stage of language development which is as far as the child can go without concomitant development of abstractive ability. It is this abstracting ability that is necessary for true formal language to occur. Most social learning theorists accept the biological understructure of language and speech but see it as a potential that can be actualized only by active interaction with a social environment.

Luria (1961), in reviewing the works of Vygotsky (1962) and other Soviet researchers, presents considerable support for the theory that language has a biological origin and that it unravels in developmentally determined stages. During the first stage, speech functions primarily on the motor operations (stimuli perception and impulse control) of the child. For example, if a child is asked to stack rings on a spool he will begin the operation. Once he has started the operation he cannot respond to any mid-operation correction. The command, "Take the rings off" will only accelerate the original process. At this stage speech can initiate simple motor operations but these operations cannot be sequenced and once they have started they cannot be changed.

During the second stage the child's speech begins to regulate his behavior. The child can express basic wants--"Mammy, I'm hungry!" or "Mammy, I have to go to the bathroom!" However, speech is still used, as in the previous stage, to regulate and direct basic impulses. It is only at the third stage that the regulatory functions of speech recede into the background. Now the child can use speech to sequence and connect his experiences. The child has no difficulty in responding to the command: "Put the

red ring on the bottom of the spool, the green one in the middle and the blue one on the top."

By the fourth stage the child has developed the basic forms of later language. There is a shift to higher forms of internalized speech which connects the components of thought and action. The child perceives the relevant reoccurring patterns. In other words, he is able to abstract rules from the stimuli he perceives. For example, at this stage the complex motor operation of tying a shoelace is no longer a baffling experience. Language gives the child a mental picture of the whole and its parts, integrates tactile and visual feedback and permits successful manipulation of the shoestring into the shoelace. After the fourth stage, the verbal analysis of events begins to play a dominant role in the formation of higher concepts. The child orients himself to his experiences and environment with the help of rules he has verbally formulated. For Luria the abstracting and generalizing function of speech permits the development of higher species-specific behavior.

Using these models, various aspects of the autistic child's speech, features already noted such as echolalia, part-whole confusion, extreme literalness and repetition,

can be integrated and related. Features of autistic children's speech can be viewed as manifestations of a central language disorder. At the core of this disorder is an impairment in the encoding-decoding process or rule-formation ability. An arrest in the development of these processes can explain delays in general development and the acquisition of speech. Children who are "stuck" at the echolalia level of speech development are at a marked disadvantage for both initiating and continuing meaningful early interpersonal experiences.

The complicated manner in which individuals come to know and understand others is the focus of much research. Individuals can be characterized by height, bulk, color, and movement. Recent developments in the field of person perception indicate that highly complex processes operate within the individual. Perception of body-language, the accuracy of the judgment of emotional states, the manner in which information is combined to form an impression and the way in which weight is assigned to information are critical in the unfolding of the child's personality and his extended transaction with the external social environment. A malfunction in the language process, as used in this paper, can account for the impairment of relationships.

Withdrawal, avoidance of eye contact, lack of response to human contact and other impairments of relationships may simply be the autistic child's response to complex stimuli of which he cannot make sense. Other aspects of the disorder, such as maintaining sameness and ritualistic, compulsive and stereotyped behavior can be explained by the child's inability to formulate rules governing the reoccurring events.

The major characteristic of an autistic child's language, then, is his inability to deal with symbolic forms. Fantasy play is absent or impoverished. Pictures have little meaning, the child may match one picture to another picture with ease, yet he cannot match the picture to the real object. He cannot grasp the representational nature of the object or the event. These children have many speech production difficulties but evidence seems to indicate that this is not the main cause of their inability to develop spoken language. When articulation difficulties improve there is no concomitant improvement in the use of language. The exact point in the encoding-decoding process that deals with symbolization has yet to be determined. However, the inability to deal with symbolic forms and to classify a set of symbols into the language system of his

culture is the basic part of the autistic child's central language disorder.

SUMMARY OF THE DISCUSSION

The major feature of autistic children is simply a disturbance of communication with others. This is true regardless of what other symptoms may be present. The child is out of contact. The communication problem does not reside only in impaired speech production but also in a disturbance of language--the symbolic aspects of speech, including the meaning of words, the manipulation of syntax and the grasp of abstract meaning. Within this context it is understandable why meaningful communicative speech has the greatest bearing on subsequent clinical recovery. A profound language loss may simultaneously account for a lack of substitute channels of communication that mute and deaf children seem to develop. More research is needed to determine the loci of the disorder. At present it can be explained as a malfunction of the encoding-decoding process or of the rule-extrapolation process. Furthermore, it seems reasonable to conclude that this major feature may impair appropriate object use and ultimately interpersonal relationships.

As has been noted, this is not to imply unitary etiology. Nor is it to say that a central language disorder is the only deficit in autistic children. Many writers have noted other disorders. The argument here is that a central language disorder may be the necessary and sufficient cause of that behavior which marks children as autistic.

IMPLICATIONS FOR PRESCHOOL PROGRAMS

Normal children spend many months learning about their world before they understand and initiate speech. If one accepts the previous arguments that speech is the end product of motor-perceptual-cognitive processes and that autistic children suffer from a malfunction of these processes, then the core of early childhood intervention programs must deal with pre-verbal levels of experience. Infants are born with an ability to order and integrate their sense experiences. However, the child does not understand through all sense modalities simultaneously. Savage (1971), citing the work of Piaget (1955), describes the evolution of the concept "mother." At birth "mother" is a comfort-concept experienced tactually and orally. Later, the infant draws reassurance from the sight of mother's face and still later by the sound of her voice. There is a shift from proximal receptors to distance receptors. The child assimilates the concept "mother" through the currently used modality and integrates it with the previously learned concepts to form a composite picture of "mother." Therefore, it is illogical to bombard the child

with visual-auditory stimuli if he is still tied to proximal receptors of touch, taste, and smell.

This information can be the basis for organizing stimuli for the autistic child. It is not enough to repeat lost experiences. The stimulus presented to the child must be further reduced to a level at which he can deal. Information must be organized in such a way that the child has a reasonable chance of learning to organize it. This can be done in two ways: (1) reducing the stimulus to its simplest form, and (2) selecting one sense modality. A unisensory approach has the advantage of being tied to developmental theory. It is impossible to exclude all other stimuli. Yet the teaching situation can be so structured that one modality predominates.

The selection of the first modality is of critical importance because the subsequent success of organizing stimuli is based on it. Once the first modality is selected the focus is on the stimuli. Any material must be at a conceptual level simple enough for the child to understand and it must be meaningful. Household events and objects--meals, washing, cups, plates--that relate to human functions are the most powerful tools in teaching basic concepts of color, weight, shape, volume, etc. At

every stage in the learning process it is vital to ensure that the child has generalized from the specific teaching situation to all similar situations which he could reasonably have experienced.

The same care must be taken in introducing the second modality as with the first. An additional dimension has been added in that the second modality must be integrated with the first to form a concept of the whole. For example, a child may know a slice of bread through touch, taste, and smell. His concept of bread is enlarged by experiences which lead him to see other parameters, such as visual aspects (round, oblong, brown, black, and white); measurable aspects (volume, mass, linear, and weight); and later functional and social uses. Ultimately, the learning tool and the first and subsequent modalities used in any educational program must depend upon careful assessment of the individual child.

In summary, children do not use all sense modalities simultaneously. Rather, they learn through proximal receptors first and later shift to distance receptors. Children must actively interact with their environment to learn extended concepts. The autistic child has many difficulties in childhood and special emphasis should be

placed on motor-perceptual-cognitive activity in an effort to develop language which will facilitate speech.

In our concern for treating the central language disorder, it is important to remember that the autistic child is a human being and not just a motor-perceptual-cognitive problem. The child must learn that his environment consists of people as well as objects and events.

REFERENCES

- Allan, J. D., & Holt, K. S. (Eds.) Biochemical approaches to mental handicap in childhood. Baltimore: Williams & Wilkins Co., 1965.
- Bettelheim, B. The empty fortress: Infantile autism and the birth of the self. New York: Free Press, 1967.
- Breger, L. Comments on building social behavior in autistic children by use of electric shock. Journal of Experimental Research, 1965, 1, 110-113.
- Browne, I. Problems of infantile autism. In J. D. Allen and K. S. Holt (Eds.), Biochemical approaches to mental handicap in childhood. Baltimore: Williams & Wilkins Co., 1965.
- Bruner, J. Contemporary approaches to cognition. Cambridge, Mass.: Harvard University Press, 1957.
- Chapman, A. H. Early infantile autism in identical twins: Report of a case. A.M.A. Archives of Neurology and Psychiatry, 1957, 54, 621-623.
- Chomsky, N. Syntactic structures. The Hague: Mouton & Co., 1957.
- Chomsky, N. Current issues in linguistic theory. The Hague: Mouton & Co., 1964.
- Chomsky, N. Language and mind. New York: Harcourt, Brace & World, 1968.
- Churchill, D. The relation of infantile autism and early childhood schizophrenia to developmental language disorders of childhood. Journal of Autism and Childhood Schizophrenia, 1972, 2, 182-197.

- Creak, M. Schizophrenic syndrome in childhood: Progress report of a working party. Cerebral Palsy Bulletin, 1961, 3, 501-504.
- Creak, M. Schizophrenic syndrome in childhood: Further progress report of a working party. Developmental Medicine and Child Neurology, 1964, 4, 530-535.
- Cunningham, M. A., & Dixon, C. A study of the language of an autistic child. Journal of Child Psychology and Psychiatry, 1961, 2, 193-202.
- De Cecco, J. P. (Ed.) The Psychology of language, thought and instruction. New York: Holt, Rinehart & Winston, 1967.
- DeMyer, M. K. Perceptual limitations in autistic children and their relation to social and intellectual deficits. In M. Rutter (Ed.), Infantile autism: Concepts, characteristics and treatment. London: Churchill, 1971.
- DeMyer, M., & Ferster, C. The development of performances in autistic children in an automatically controlled environment. Journal of Chronic Disorders, 1961, 13, 312-345.
- Des Lauriers, A., & Carlson, C. Your child is asleep: Early infantile autism. Homewood, Ill.: Dorsey Press, 1969.
- Donovan, W., Jr. My experiences as an autistic child. Research and education: Top priorities for mentally ill children. Rockville, Md.: National Society for Autistic Children, 1971.
- Eisenber, L. The autistic child in adolescence. American Journal of Psychiatry, 1956, 112, 607-612.
- Frith, U. Studies in pattern detection in normal and autistic children: I. Immediate recall of auditory sequences. Journal of Abnormal Psychology, 1970, 76, 413-320. (a)

- Frith, U. Studies in pattern detection in normal and autistic children: II. Reproduction and production of color sequences. Journal of Experimental Child Psychology, 1970, 10, 120-135. (b)
- Frith, U. Cognitive mechanisms in autism: Experiments with color and tone sequence production. Journal of Autism and Childhood Schizophrenia, 1972, 2, 160-173.
- Harshman, H. (Ed.) Educating the emotionally disturbed child. New York: Crowell & Co., 1969.
- Hebb, D. O. The organization of behavior. New York: Wiley, 1949.
- Hebb, D. O. A textbook of psychology. Philadelphia: Saunders Co., 1958.
- Hermelin, B. Rules and language. In M. Rutter (Ed.), Infantile autism: Concepts, characteristics and treatment. London: Churchill, 1971.
- Hermelin, B., & Frith, U. Psychological studies of childhood autism: Can autistic children make sense of what they see and hear? Journal of Special Education, 1971, 5, 107-117.
- Hermelin, B., & O'Connor, N. Psychological experiments with autistic children. New York: Pergamon Press, 1970.
- Hewett, F. Teaching speech to an autistic child through operant conditioning. American Journal of Orthopsychiatry, 1965, 35, 927-936.
- Hewett, F. The emotionally disturbed child in the classroom: A developmental strategy for educating children with maladaptive behavior. New York: Allyn & Bacon, 1968.
- Himwich, H. A biochemical study of early infantile autism. Journal of Autism and Childhood Schizophrenia, 1972, 2, 114-126.
- Hutt, S., et al. Arousal and childhood autism. Nature, 1964, 204, 908-909.

- Itard, J. The wild boy of Aveyron. New York: Appleton-Century-Croft, 1962.
- Kanner, L. Autistic disturbances of affective contact. Nervous Child, 1943, 2, 217-250.
- Kanner, L. Early infantile autism: 1943-1955. American Journal of Orthopsychiatry, 1956, 26, 556-564.
- Kanner, L. Infantile autism and schizophrenia. Behavioral Science, 1965, 10, 412-420.
- Kanner, L. Follow-up study of eleven autistic children originally reported in 1943. Journal of Autism and Childhood Schizophrenia, 1971, 1, 119-145.
- Kanner, L., & Eisenberg, L. Early infantile autism: 1943-1955. Psychiatric Research Report, 1957, 7, 55-65.
- Kolvin, I. Psychoses in childhood--a comparative study. In M. Rutter (Ed.), Infantile autism: Concepts, characteristics and treatment. London: Churchill, 1971.
- Kugelmass, I. The autistic child. Springfield, Ill.: Charles C. Thomas, 1970.
- Lenneberg, E. Biological foundations of language. New York: Wiley, 1967.
- Lenneberg, E. H. (Ed.) New direction in the study of language. Cambridge, Mass.: Massachusetts Institute of Technology Press, 1964.
- Lovaas, O. A program for the establishment of speech in psychotic children. In J. K. Wing (Ed.), Early childhood autism. London: Pergamon Press, 1966.
- Lovaas, O. I. Strengths and weaknesses of operant conditioning techniques for the treatment of autism. Research and education: Top priorities for mentally ill children. Rockville, Md.: National Society for Autistic Children, 1971.
- Lovaas, O., Berberich, J. P., Perloff, B., & Schaeffer, B. Acquisition of imitative speech by schizophrenic children. Science, 1966, 151, 705-707.

- Lovaas, O., Freitag, G., & Kinder, M. I. Establishment of social reinforcers in two schizophrenic children on the basis of food. Journal of Experimental Child Psychology, 1966, 4, 109-125.
- Luria, A. R. The role of speech in the regulation of normal and abnormal behavior. New York: Livingstone, 1961.
- Maltzman, Irving. Thinking: From a behavioristic point of view. Psychological Review, 1955, 62, 275-286.
- Martin, J. A. Sensory disorder in the autistic child and its implication for treatment. In M. Rutter (Ed.), Infantile autism. London: Churchill, 1971.
- McNeill, D. The acquisition of language: The study of developmental psycholinguistics. New York: Harper & Row, 1970.
- Miller, G. Some preliminaries to psycholinguistics. American Psychologist, 1965, 20, 15-20.
- O'Connor, N. Visual perception in autistic childhood. In M. Rutter (Ed.), Infantile autism: Concepts, characteristics and treatment. London: Churchill, 1971.
- O'Gorman, Gerald. The nature of childhood autism. New York: Appleton-Century-Crofts, 1967.
- Osgood, C. Contemporary approaches to cognition. Harvard, Mass.: Harvard University Press, 1957.
- Osgood, C. On understanding and creating sentences. American Psychologist, 1963, 18, 735-751.
- Piaget, J. The child's construction of reality. London: Routledge, 1955.
- Pribram, K. Autism: A deficiency in context--dependent processes? Research and education: Top priorities for mentally ill children. Rockville, Md.: National Society for Autistic Children, 1971.
- Pronovost, W. The speech behavior and language comprehension of autistic children. Journal of Chronic Diseases, 1961, 13, 228-233.

- Rimland, B. Infantile autism: The syndrome and its implications for a neural theory of behavior. New York: Appleton-Century-Crofts, 1964.
- Rimland, B. The differentiation of childhood psychoses: An analysis of checklists for 2,218 psychotic children. Journal of Autism and Childhood Schizophrenia, 1971, 1, 161-174. (a)
- Rimland, B. The institute for child behavior research study of high dosage vitamins as a method of treating severely mentally ill children. Research and Education: Top priorities for mentally ill children. Rockville, Md.: National Society for Autistic Children, 1971. (b)
- Rutter, M. Behavioral and cognitive characteristics. In J. Wing (Ed.), Early childhood autism. London: Pergamon Press, 1966.
- Rutter, M. Concepts of autism: A review of research. Journal of Child Psychology and Psychiatry, 1968, 9, 1-25.
- Rutter, M. (Ed.) Infantile autism: Concepts, characteristics and treatment. London: Churchill, 1971.
- Rutter, M., & Bartak, L. Causes of infantile autism: Some considerations from recent research. Journal of Autism and Childhood Schizophrenia, 1971, 1, 20-32.
- Rutter, M., et al. Autism--a central disorder of cognition and language? In M. Rutter (Ed.), Infantile Autism: Concepts, characteristics and treatment. London: Churchill, 1971.
- Savage, V. A. An approach to treatment in the young autistic child. In M. Rutter (Ed.), Infantile autism: Concepts, characteristics and treatment. London: Churchill, 1971.
- Shaberman, R. B. Autistic children: The nature and treatment of childhood autism. London: Stuart & Watkins, 1971.

- Skinner, B. F. Verbal behavior. New York: Appleton-Century-Crofts, 1957.
- Stauffer, R. G. (Ed.) Language and the high thought processes. Champaign, Ill.: National Council of Teachers of English, 1965.
- Turner, G. J. & Mohan, B. A. A linguistic description and computer program for children's speech. London: Routledge & Kegan Paul, 1970.
- Ullman, L., & Krasner, L. (Eds.) Case studies in behavior modification. New York: Holt, Rinehart & Winston, 1965.
- Vetter, H. Language behavior and psychopathology. Chicago: Rand McNally, 1969.
- Vygotsky, L. S. Thought and language. Cambridge, Mass.: Institute of Technology Press, 1962.
- Wing, J. K. Diagnosis, epidemiology, aetiology. In J. K. Wing (Ed.), Early childhood autism. New York: Pergamon Press, 1966. (a)
- Wing, J. K. (Ed.) Early Childhood Autism. London: Pergamon Press, 1966. (b)
- Wing, L. Perceptual and language development in autistic children: A comparative study. In M. Rutter (Ed.), Infantile autism: Concepts, characteristics and treatment. London: Churchill, 1971.
- Wolff, S., & Chess, S. An analysis of the language of fourteen schizophrenic children. Journal of Childhood Psychology and Psychiatry, 1965, 6, 29-41.
- Yates, A. Behavior therapy. New York: Wiley, 1970.