9-1983

An Eclectic Approach to the Identification and Treatment of the Cluster of Disorders Known as Infantile Autism

Margaret Considine

Follow this and additional works at: http://digitalcommons.wku.edu/theses

Part of the Child Psychology Commons

Recommended Citation
http://digitalcommons.wku.edu/theses/1904

This Thesis is brought to you for free and open access by TopSCHOLAR®. It has been accepted for inclusion in Masters Theses & Specialist Projects by an authorized administrator of TopSCHOLAR®. For more information, please contact topscholar@wku.edu.
AN ECLECTIC APPROACH TO THE
IDENTIFICATION AND TREATMENT OF
THE CLUSTER OF DISORDERS KNOWN
AS INFANTILE AUTISM

A Thesis
Presented to
the Faculty of the Department of Psychology
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

by
Margaret J. Considine
September 1983
AUTHORIZATION FOR USE OF THESIS

Permission is hereby

☑ granted to the Western Kentucky University Library to
make, or allow to be made photocopies, microfilm or other
copies of this thesis for appropriate research or scholarly
purposes.

☐ reserved to the author for the making of any copies of this
thesis except for brief sections for research or scholarly
purposes.

Signed  [Signature]

Date  Oct 19, 1983

Please place an "X" in the appropriate box.

This form will be filed with the original of the thesis and will control
future use of the thesis.
AN ECLECTIC APPROACH TO THE
IDENTIFICATION AND TREATMENT OF
THE CLUSTER OF DISORDERS KNOWN
AS INFANTILE AUTISM

Recommended October 18, 1987
(Date)

Harry R. Rubin
Director of Thesis

Betty Houston

C. Clinton Layne

Approved December 19, 1983
(Date)

James Gray
Dean of Graduate College
Acknowledgements

To my parents whose love and support enabled me to continue even when I felt that I would never see the end. I appreciate all the love and dedication they have given me throughout my life. My thanks to Harry Robe for allowing me to do this type of paper and my committee for agreeing to it. I appreciate all the help and information I received from the different institutions that I visited. A special thanks to Dr. Metze, Gary and Debby for their help with the word processing and typing of this paper.
# Table of Contents

<table>
<thead>
<tr>
<th>Acknowledgements</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of Tables</td>
<td>vi</td>
</tr>
<tr>
<td>Abstract</td>
<td>vii</td>
</tr>
<tr>
<td><strong>Chapter</strong></td>
<td></td>
</tr>
<tr>
<td><strong>I. Introduction</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>II. Etiology.</strong></td>
<td>11</td>
</tr>
<tr>
<td>Psychogenic Basis</td>
<td>11</td>
</tr>
<tr>
<td>Biochemical Studies</td>
<td>14</td>
</tr>
<tr>
<td>Neurobiological Studies</td>
<td>18</td>
</tr>
<tr>
<td><strong>III. Differential Diagnosis.</strong></td>
<td>24</td>
</tr>
<tr>
<td>Autism and Mental Retardation</td>
<td>24</td>
</tr>
<tr>
<td>Autism and Schizophrenia.</td>
<td>25</td>
</tr>
<tr>
<td>Autism and Hearing Impairment</td>
<td>26</td>
</tr>
<tr>
<td>Autism and Developmental Language Dis-</td>
<td></td>
</tr>
<tr>
<td>orders</td>
<td>27</td>
</tr>
<tr>
<td><strong>IV. Specific Treatment Centers.</strong></td>
<td>29</td>
</tr>
<tr>
<td>Indiana University DTC Autistic Program</td>
<td>29</td>
</tr>
<tr>
<td>TEACCH Program North Carolina</td>
<td>31</td>
</tr>
<tr>
<td>Judevine Center Program</td>
<td>33</td>
</tr>
<tr>
<td>Louisville Pre-School Program</td>
<td>34</td>
</tr>
<tr>
<td>Summary</td>
<td>36</td>
</tr>
<tr>
<td><strong>V. Treatment Approaches.</strong></td>
<td>37</td>
</tr>
<tr>
<td>Psychopharmacological Approaches</td>
<td>38</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>Page</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Behavior Modification Programs</td>
<td>40</td>
</tr>
<tr>
<td>Educational and Developmental Approaches</td>
<td>43</td>
</tr>
<tr>
<td>Study of Treatment Approaches</td>
<td>49</td>
</tr>
<tr>
<td>Treatment Based on Symptoms (Behavioral)</td>
<td>52</td>
</tr>
<tr>
<td>Self-Stimulation</td>
<td>52</td>
</tr>
<tr>
<td>Self-Injurious Behavior</td>
<td>58</td>
</tr>
<tr>
<td>Language Disorders</td>
<td>64</td>
</tr>
<tr>
<td>Reference Notes</td>
<td>73</td>
</tr>
<tr>
<td>References</td>
<td>74</td>
</tr>
<tr>
<td>Tables</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>------</td>
</tr>
<tr>
<td>1</td>
<td>DSM - III Classification</td>
</tr>
<tr>
<td>2</td>
<td>DSM - III Differential Diagnosis</td>
</tr>
<tr>
<td>3</td>
<td>Autistic-like Behaviors and Treatment Procedures</td>
</tr>
</tbody>
</table>
An Eclectic Approach To The Identification and Treatment Of The Cluster of Disorders Known As Infantile Autism

Margaret J. Considine

September 1983

Directed by: Harry Robe, Betsy Howton, and Clint Layne

Department of Psychology
Western Kentucky University

The present research is a comprehensive look at the causes and treatment of autism. To date the research has not found the etiology of autism, even though many areas have been examined. The areas looked at are psychogenic, biochemical, and neurobiological. Some of these areas seem promising and may in the future shed more light on why these persons present this particular cluster of problem behaviors.

Approaches to the treatment of autism have not yielded an all encompassing cure for autism. Therefore, the symptoms of autism were presented along with the current treatments that are most successful in dealing with these symptoms. Facilities that work with these people were visited and the approaches they use were presented.
Chapter I

Introduction

Autism for too long has been thought of as a single entity or a disease with its particular set of symptoms, etiology, treatment and prognosis. It will be the purpose of this paper to follow the lead of the DSM III and look at it from the perspective of a developmental disorder with a collection of symptoms. The term "autism" seems to represent a complicated structure of many variables, and each affected child may present a different aggregation of these symptoms.

The difficulty that has been encountered when trying to define autism and the bearing this difficulty has had on treatment approaches used with these children, will be discussed. Included in the paper are sections on the definition, causes, and treatment approaches of autism.

Most researchers have struggled to find a single cure for autism, from their particular theoretical perspective. This author feels that the cluster of symptoms that are attributed to autism should be studied individually to discover areas in which the child is developmentally delayed, and treatment should progress from that point. Within this framework, the treatments that are currently being used and those that have been shown to be most effective when dealing
with specific problems will be presented. This information will help those dealing with these children to find a solution to problems that are identified.

Kanner (1943) first proposed the diagnosis of autism over 25 years ago. The term "autism" in itself implies the preoccupation with one's thoughts and daydreams. Kanner carefully observed 11 children with a previously unrecognizable syndrome. He noted a variety of behavioral features that seemed to be characteristic of all 11 children and separated them from children with other disorders. Kanner's initial description of 11 autistic children presented a comprehensive picture of the syndrome. In fact, the set of critical symptoms he described has not changed significantly since that time. The following were Kanner's major points:

(1) The child showed an extreme autistic aloneness and an inability to relate to people.

(2) The child failed to assume an anticipatory posture in preparation to being picked up.

(3) There were speech problems; some children were mute; others showed delayed echolalia; personal pronouns were repeated just as heard, there was literalness in comprehension of speech.

(4) The child had an anxious obsessive desire for the maintenance of sameness.

(5) There was limitation in the variety of spontaneous activity.

(6) The child reacted to external intrusions such as
food, loud noises, and moving objects.

(7) The child was interested in objects and reacted to people as objects. When pricked, the child showed fear of the pain but not of the person who pricked him.

(8) The child had excellent rote memory.

(9) The child was physically normal, showing good cognitive potential and serious-mindedness.

(10) All autistic children came from highly intelligent families.

Finally, these characteristics were present in infancy, which made the disorder different from all previously described varieties of schizophrenia or child psychosis.

Over the years the behavioral symptoms of autism seem to separate into five subclusters. These include disturbances of perception, developmental rate, relating, speech and language, and motility.

Some studies indicate that there is a malfunction in a neuropathophysiological process that is common to all autistics and causes their perceptual problems. The extreme difficulty that most autistic children have with even the most basic intellectual and language developmental tasks has often been attributed to perceptual disturbances.

One of the areas of perceptual research that has been delved into extensively has been the concept of stimulus overselectivity. This concept refers to the fact that autistic children tend to respond to only a few cues when a larger range of cues is available in a learning task.
(Loveas, 1971).

It has been observed that autistic persons tend to have proximal receptors (touch, smell, and taste) rather than distal receptors (hearing and seeing) (Schopler, 1965). Autistic patients seem to have fewer eye movements and to spend less time regarding visual display than do nonautistic individuals. (Hermelin & O'Connor, 1970).

Perceptual disturbances cause the child to come up with unusual responses as a result of unusual interpretations of sensory stimuli. The disturbance may cause hypo- or hyper-responsiveness. In hyporeactivity there may be no startle response to very loud sudden noise, and there may be delayed attention to those and other sounds (Condon, 1975).

Opposite to such hyporeactivity are very exaggerated reactions to the same stimuli. In this state, patients show heightened awareness and sensitivity to stimuli (Goldfarb, 1963). They may also seek out stimulation. Behaviors such as making sound by scratching surfaces while putting the ears close to listen, being distracted by background stimuli of marginal intensity, rubbing, banging, or flicking at the ears, and teeth-grinding are all activities that induce auditory input.

The gross motor development of many individual autistic infants and children has been described as within normal limits. However, when groups of autistic children were compared with normal children, the autistic children showed significantly lower levels of motor skills (DeMyer, Barton,

Variability can also affect developmental milestones. Delays and deviations in the rate of development may occur; developmental spurts may alternate with arrests. For example, autistic children may precociously sit without support but be delayed in pulling themselves up to a standing position. Variability among areas of development may also be found; for example, motor coordination is usually good but motor development may remain uneven. Autistic children may run with stiff arms or climb stairs awkwardly. Motor dyspraxia appears in varying degrees (Fish, 1960; Ornitz and Ritvo, 1976).

The characteristic of autistics that depresses parents and puzzles therapists the most is the unresponsiveness to the social environment. They do not play with toys or interact with other children. They do not seem to know or care who their parents are.

Several studies (Wing, 1969, Churchill and Bayson, 1972, Bartak, Rutter, and Cox, 1975) have shown that autistic children's social development has a number of rather distinctive features. First, there is a lack of attachment behavior and a relative failure of bonding that is most marked in the first 5 years. Unlike normal toddlers, autistic children tend not to follow their parents about the house and they do not run to greet them when the parents return after having been out. This behavior pattern, however, does not usually manifest itself by physical
withdrawal from people (Rutter, 1966), but is exhibited in failure to initiate contact, in "looking through" people, in appearing distant, aloof or in a shell, in extreme aloneness and in strong attachments to inanimate objects.

At approximately age 5, many of the social impairments may no longer be evident, but serious social difficulties continue as evidenced by lack of cooperative group play with other children and failure to make personal friendships. There also is a lack of empathy and a failure to perceive other people's feelings and responses. This abnormality often results in the child's saying or doing socially inappropriate things (Rutter, 1978).

About 50 percent of autistic children, particularly those who are mentally retarded, never gain useful speech. Acquisition of speech is characterized by deviations not found in other disorders such as retardation (Rutter & Lockyer, 1967).

Speech and language development may be delayed (muteness), or fixations may occur along the normal course of development (Shapiro & Lucy, 1978). With those who do learn to speak, echolalia is a common feature and is usually accompanied by the misuse or reversal of pronouns (Wing, 1966; Rutter, 1968).

Speech tends not to be used in the usual way for social communication. Thus the autistic child tends to talk much less than the normal child of a comparable level of language development. Although the normal toddler may be silent in
the presence of a stranger, he is likely to talk nonstop as he follows his mother about the house. Autistic children rarely do this. They seem to lack the ability to carry on the normal to-and-fro chatter of an everyday conversation (Rutter, 1965).

The extreme deficiencies in abilities for concept formation (Noach, 1974), and the overwhelming dependence on the use of imagination as a major strategy in linguistic coding (Shapiro and Kapit, 1978) in those autistic children who do possess some language skills, present a rather pessimistic outlook for the eventual development of true spontaneous speech in the majority of autistic children, even with intensive behavioral procedures (Lovaas, 1977; Carr, 1979; Prior, 1979).

The motility disturbance that is displayed by the majority of autistics involves the hand and arms (Sorosky, 1968). Abnormal hand gestures, including fixed posturing and movement gestures such as flapping, clapping, rubbing, and pinching, were displayed by 16 of 18 autistic children during uncontrolled environmental conditions (Masagatani, 1973). These disturbances are often the characteristics most noted because they make the autistic stand out in a crowd (Sorosky, 1968).

In 1943, Kanner said that autism was not related to any known neurological condition and implied that autistic children had basically normal intelligence. For years afterwards diagnosticians generally believed that the presence of
mental retardation or neurological signs ruled out the
diagnosis of infantile autism, even if the child met all
behavioral criteria (Eisenberg, 1966). Thus diagnosis was
frequently one dimensional; a child was labeled as having
either infantile autism or mental retardation, not both.
However, later studies showed that the I.Q. in autistic
children functions in much the same way as in any other
group of individuals (Lockyer & Rutter, 1969; DeMyer,
Barton, Alper, Kimberlin, Allen, Yang & Steel, 1974).
Autistic children with low I.Q.s are just as retarded as
anyone else with a low I.Q., and the score means much the
same thing. In other words, autism and mental retardation
often exist together.

Since the time of Kanner, a large amount of literature
on the subject of autism has appeared. However, this liter-
ature has been plagued by many problems. Perhaps the most
important of these is that clinicians and scientists have
not as yet reached a consensus regarding specific evaluation
procedures necessary to identify the syndrome. Neither have
they decided which symptoms must be present.

Perhaps, the most important development of the 1970’s
for the future of classification and diagnosis is the new
DSM - III. (See Table 1).
Table 1. DSM - III classification:

<table>
<thead>
<tr>
<th>Generic term</th>
<th>Subclass term</th>
<th>Diagnostic criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pervasive developmental disorders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Infantile autism</td>
<td>Full syndrome</td>
<td>All of the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a. Onset before age 30 months.</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>b. Serious lack of social response.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c. Language deficit-gross</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d. Speech peculiar, if present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e. No delusion/hallucinations</td>
</tr>
<tr>
<td>2. Childhood onset pervasive</td>
<td>Full syndrome</td>
<td>a. Severe disturbance of emotional relations</td>
</tr>
<tr>
<td>developmental disorder</td>
<td></td>
<td>b. Three or more of: excess anxiety; affect disturbance; resist change; peculiar</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>motility; dysprody; abnormal sensation; self-mutilation; onset between ages 2 1/2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and 12 years; and no delusions/hallucinations.</td>
</tr>
<tr>
<td>3. Atypical pervasive developmental disorder</td>
<td></td>
<td>Distortion of social and cannot be classified as</td>
</tr>
</tbody>
</table>
Generic term: Schizophrenic disorders

Subclass term

Schizophrenic disorder in childhood (5 subtypes as for adults)

Full syndrome

Residual

Diagnostic criteria

As for adult schizophrenia, a. At least 1 or 10 delusional, hallucinatory,
associational, or affectional symptoms
b. Impairment in two or more routine functions.
c. Continuous illness for at least 6 months.

There seems to be no universally accepted definition of the disorder known as infantile autism. Therefore, it would appear logical that the individual symptoms of this disorder be viewed as areas in which the child is developmentally delayed. For instance, if the child is mute, the acquisition of language becomes the treatment goal rather than a global treatment for the whole disorder. The clinician should concentrate on finding methods that have been proven useful no matter what the theoretical orientation. Later in this paper some of the different treatment approaches will be presented.
Chapter II
Etiology

No one knows what causes autism. It strikes an average of four of every ten thousand children, occurring two to four times more frequently in boys. In some cases infants display symptoms from birth; in others, they may develop normally up to age two-and-a-half, and then suddenly retreat into the isolation of autism. Until recently, many experts believed that this withdrawal into the self was a form of psychosis or a defensive reaction against cold, unfeeling parents. Today most authorities agree that autism is a hereditary defect that results either from a disturbance in the body's central nervous system or from some sort of chemical imbalance.

Psychogenic Basis

Kanner was the first to describe the mothers of autistic children as "refrigerators." He claimed there was a consistent pattern in their personalities and in their attitudes toward their children. Rank (1949) described these mothers as immature and narcissistic. He felt that they were incapable of forming mature emotional relationships. Bettelheim (1967) in his book The Empty Fortress sees autism as arising out of the infant's early life experiences and
implicates stress in early mother-child relations. He feels that somehow the mother has failed to meet the needs of the child and the child is frustrated and feels there is nothing he can do about an unpredictable and unresponsive world, so he becomes autistic.

Trustin (1973) in her book *Autism and Childhood* 

*Psychosis* feels that autism is caused by a gross lack or partial lack of nurturing. She feels autism is an extension of the time when the child feels part of the mother and does not experience himself as a separate entity. The normal progression for a child to make is a gradual awareness of self through maternal support. At this stage the baby begins to differentiate his own body parts, sees himself as separate from mother, and differentiates people and things. The autistic child because of rejection by the mother resulting in excessive frustration never progresses into this stage.

Another theory put forth by Ward (1976) indicates that mothers-to-be of autistic youngsters may possibly be prone to certain types of emotional problems during pregnancy. This hypothesis proposes that the mother's anxiety during pregnancy produces a child who is slower in his sensory development. As the child develops the mother is unable to meet the special needs of her child, and autism results. As of yet, however, it has not been proven that anxiety in the mother produces abnormalities in the fetus. This theory has some interesting possibilities and should be investigated further.
The above theories have been criticized by Rimland (1964) and Wing (1966). Their argument rests on three points. Few orphanage children develop autism. Secondly, no adequate demonstration of coldness or rejection in mothers of autistic children has been made available in the literature. Thirdly, the mothers of autistic children often have other normal children.

Those theories that favor the idea that autism is caused by an emotional malfunction between parent and child have tended to die out because of lack of experimental support. A study done by Pitfield and Oppenheim (1964) did not confirm the view that the parents of autistic children are cold and rejecting. The clinicians administered questionnaires designed to measure attitudes toward child-rearing. The attitudes measured were overprotectiveness, rejection, objectivity, and strictness. There was little difference between mothers of normal, mongol, and autistic children in these child-rearing traits.

Another study that failed to support the view that parental personalities are the main cause of childhood psychosis was conducted by Stroh (1962). In this study it was concluded that mothers of emotionally disturbed children did not differ from other mothers in coldness. This conclusion was based on overt behaviors demonstrated by the mothers and recorded by the workers in the experiment. The workers also found that the mothers' ability to cope was related to marital stability and the fathers' adjustment and
support. Finally, Rutter (1974) feels that there is so much evidence against the view that autism is a primarily psychogenic disorder that it would not seem worthwhile to investigate further.

Biochemical Studies

A more current theory, also unproven, describes autism as an organic disorder, caused by some biochemical problem in the brain. Most of the biochemical investigations in autism have been concerned with neurotransmitters, though a few other biochemical processes have also been studied. Although various approaches have been used, no specific biochemical markers have been found.

Though several neurotransmitters have been studied, serotonin has been the focus of most neurotransmitter research in autistic children. Serotonin (5HT, 51-hydroxytryptamine) is an indolamine that has been indentified as a neurotransmitter within the central nervous system. Serotonin is thought to be important in emotional, perceptual and cognitive functions. It has been suggested that psychiatric disorders may be caused by abnormalities in the serotonin metabolism. Serotonin is also transported by platelet cells in whole blood. Since the biochemical systems within platelets responsible for uptake, binding and efflux of serotonin are similar to those within central nervous system neurons, it is thought that they can serve as a model for studying said neurons.

Schain and Freedman (1961) reported elevated blood
serotonin concentrations in 6 of 23 autistic children. Furthermore, they observed that patients with the highest levels were also the most severely retarded. In 1970, Ritvo and his colleagues (Ritvo et al., 1970) studied 24 autistic patients and found an inverse relationship between age and blood serotonin concentrations. They also found that the mean serotonin levels and platelet counts of certain age groups of autistics were significantly higher than age-matched comparison cases. Neither study was able to conclude that autism was caused by these elevated platelet counts.

Campbell et al. (1974) reported the first of two studies in which the blood serotonin levels in emotionally disturbed and neurologically impaired children were evaluated. Consistent with the findings of Schain and Freedman (1961) they found that low IQ was related to elevations of serotonin. They reported a second study in 1975 which expanded and confirmed their previous results (Campbell et al., 1975).

More consistent with Ritvo et al. (1970) are the findings reported by Yuwiler (1971). They also found an inverse relationship between age and blood serotonin concentrations, with the older patients having a lower level of concentration.

Finally, a study conducted by Hanley, Stahl, and Freedman (1977) also found a connection between IQ and serotonin levels. A similar relationship of low intellectual
and urine, urtic acid is a product of the breakdown of cells.

evaluated for such things as the level of urtic acid in blood

In a study by Colmar (1976), 67 autistic children were

shift to autism becomes clear.

significance of puertorubin extraction and a possible relation-

experiences will obviously have to be conducted before the

further can evidence of psychopathology in these parents. Further

exceeded puertorubin. Behavioral data did not reveal significant

many parents of the autistic children under investigation

investigations of puertorubin. In addition, they observed that

normals. Harisonschmidt and Hamilton (1975) summarized their

the urtic of some autistic's, while this was not true of the

puertorubin, a deuterative of serotonin (5-HT), was present in

difficult to analyze. Hamilton et al. (1972) reported that

other biochemical studies are sparse and sometimes

Further study in this area.

an interesting situation and should point out the need for

conflicting results obtained in the above studies make for

by abnormalities in the serotonin metabolism. These

not conflict the belief that psychiatric disorders are caused

person with the plateau count. These studies, however, do

there were also studies which connected the age of the

between the I.Q. of the client and his level of serotonin.

The above studies have pointed to a relationship

than those of the mild retardates and normals.

the autistic and severe retardates were significantly higher

function to elevated 5-HT was shown. Mean 5-HT levels for
particularly the cell nuclei. Usually, it is elevated in
leukemia and gout, but it has also been reported increased
in some mentally retarded individuals. Even though in this
study 22 percent of the autistic children showed elevated
uric acid in the urine (but not in the blood), the sig-
nificance of this data is difficult to interpret.
A few studies have been reported in which the effect of
tryptophan loading in childhood psychosis has been examined.
Tryptophan is an amino acid and precursor of niacin. It is a
derivative of serotonin (5-H) and its presence is a
found that some schizophrenic children had increased
excretion of their tryptophan load. However, Zarcone et al.
(1972) found no change in behavior after administering
loading may be evident in disturbed children, but it does
not necessarily cause psychotic illnesses.
The above studies failed to identify a specific bio-
chemical marker as the cause of autism. The studies have
found that it is important to investigate variables such as
age, sex and intellectual level when working with biochem-
icals, since any one of these variables may cause alter-
atons in the chemical under study. A case in point are the
studies of serotonin, where the investigators found that
platelet levels varied with both the age and I.Q. of the
client. Biochemical studies of patients with autism and
other psychoses seem to have raised more questions than they
have answered; yet this avenue of research into the possible causes for autism continues to be important.

**Neurobiological Studies**

There has been considerable use of the EEG as a tool to determine the intactness of the central nervous system of autistic subjects. In general, EEG studies have found that a large number of psychotic children have more positive signs of neuropathology than did normal controls. The early studies using the sleeping and dreaming pattern of autistic and normal children found them not to vary significantly from each other (O'Nubier et al. 1965, Ornitz, Ritvo, and Walter 1965 a and b). Later studies, however, were found to be more fruitful (Tanguay, 1976 and Rutter, 1974). These studies demonstrated differences in EEG patterns during dream sleep (REM) in autistic and normal children.

Ornitz and Ritvo (1976) suggested that the underlying problem of autism is a disturbance of modulation or perception. The problem involves overexcitation alternating with overinhibition of sensory input. There is also an unusual preference for some sensory receptors over other receptors, and difficulties in interpreting internal sensations. They have presented data suggesting that normal phasic inhibition of the auditory evoked response during rapid-eye-movement (REM) stages of sleep is overridden in autistic children.

In one study it was found that autistic children had a significantly greater degree of arousal for auditory stimuli than normal. However, this discrepancy was not found when
comparing the differences between autistic and normals for light stimulation (Hermelin and O'Connor, 1968). When comparing institutionalized controls and 30 autistic-like children, Walter et al. (1971) found that the disturbed group had fewer mature EEG interaction patterns following visual and auditory stimulation. Small (1971) studied averaged sensory evoked responses and slow potential shifts in autistic and control children. She found that when visual stimuli were presented the response was of a low and more stable amplitude in autistic children. In contrast, auditory stimuli appeared to initiate less complex evoked responses in these children.

DeMyer et al. (1974) studied a group of 126 autistic children, mean age 5.5 years, classified as high, middle, or low functioning autistic according to the DeMyer's own criteria. They reported that 60 percent of the autistic sample had grossly abnormal EEG's characterized by focal spikes, paroxymal spikes and waves, and severe slowing. No abnormalities were found in a group of 13 normal children, although 54 percent of a group of mentally subnormal controls (mean age 4.8 years) were reported to display such abnormalities, indicating that EEG abnormalities may not be a characteristic of autism, per se, but may rather be related to a more generalized mental retardation. The authors did not report whether the lower functioning autistic had a higher frequency of EEG abnormalities than the higher functioning ones. This information would have
helped to determine whether retardation was the cause of the abnormalities.

In general, EEG studies indicate that characteristic abnormalities may exist in a large proportion of psychotic children, demonstrating positive signs of neuropathology. However, great variability in results militates against any definite conclusions regarding the type or significance of such abnormalities.

There have been other studies pertaining to neurobiological causes of autism. They include evaluating such areas as hand dominance, right-left orientation, and analyses of body tissues and cerebral spinal fluids.

Cerebral spinal fluid studies have included early ones done by Seller and Gold (1964, 1965) in which they found that cerebrospinal fluid of schizophrenic children produced seizures in mice more rapidly than control fluids. They also discovered that the serum of psychotic children produced effects that were more severe and of shorter onset than those of control serum in mice.

A later study done by Young et al. (1977) on cerebral spinal fluid was conducted in order to determine whether autism was caused by a slow virus. These investigators studied CSF immunoglobulins and found no abnormalities in glucose, protein, cells, and folate in 11 autistic children. The study did not support the theory that autism is caused by a slow virus. However, since in many cases slow virus infection and normal CSF immunoglobulins co-exist it cannot
Moore and Shipley (1971) hypothesized that autism was a
consistent with the behavioral approach,
however, who have proposed theories of causation that are
treatment rather than causation. There are a few clinicians,
there are more interested in the nature of
and less with past, and perhaps now relevant,
the present determinants of the child's disordered behavior
The majority of behavioral are concerned more with
Behavioral Theories
more productive results,

discovers the causes of autism. Further studies should yield
know what significance these findings will have in helping
or individuality, in the autistic syndrome. It is hard to
neurophysiological dysfunction. They can occur simultaneously,
studies it would seem that autism can have numerous signs of
comparison to 68 percent in normal controls. From the above
school autistics develop a right hand dominance in
Colby and Parkison (1977) found that only 35 percent of pre-
to develop a dominance in either hemisphere (anence, 1977).
reason both the autistic and normal children, born felled
they too have mixed handedness until later ages. For some
of course, autistics resemble subnormal children in this area.
developed a hand preference by the time they reach the age
by the time they start school. Most normal children have
many autistic children do not develop a hand preference

be ruled out as a hypothesis until further investigation is
result of a imprinting before birth. They state that the fetus was developmentally ready for imprinting with human behaviors before birth and, therefore, imprinted on the restricted uterine environment. The clinicians felt that the child inherited a potentially high intellectual superiority, but this atypical imprinting led to the syndrome of autism.

Observation of the interaction patterns between the autistic child and significant others in his environment indicate that the child's autistic behaviors do produce positive reinforcements (Treffert, 1970). Treffert found that tantrums, bizarre gestures, uncooperativeness, and destructiveness are often consistently followed by attention, food, and toys. He also observed that "normal" behaviors tended not to be reinforced. Hence, it is theorized the appropriate responses that the autistic child do emit do not become part of his behavioral repertoire. This theory does not explain why bizarre gestures and tantrums are part of the child's behavior to begin with. Treffert concentrated on the fact they are reinforced and, therefore, become established behavior patterns.

Similarly, Ulrich, Stachnik, and Mahry (1966) observed that parents of autistic children inadvertently give attention to behaviors that cause them stress. Head-banging, for example, tends to make parents anxious so they try to get the child to stop, thus giving the child attention for this inappropriate behavior. The child may in the future repeat head-banging in order to produce the attention he was
given before.

Behavioral theories, with the exception of Moore and Shiek (1971), concentrated on finding how the inappropriate behaviors of autism are reinforced in the child's environment. The theorists felt that these reinforcements did not necessarily cause autism, but contributed to the establishment of undesirable behaviors.
Chapter III
Differential Diagnosis

Autism and Mental Retardation

There are several ways in which the autistic and mentally retarded differ. The retarded child often has developmental delays in areas, other than language (such as motor development) which do not occur in the autistic. Although the retarded child often does not understand what is said to him, he tries to communicate through gesturing and mimicking. Overall, his interpersonal relations are not grossly impaired. He smiles at people, he recognizes his parents and tries to please them. The autistic child often does not care who his parents are, and this disinterest can be devastating to parents who are trying to help their child. The retarded child often shows better eye contact than the autistic.

Hermelin and O'Connor (1970) demonstrated several ways in which autistic children and retarded children differed. The autistic children made less use of meaning in their memory processes, were impaired in their use of concepts, and were generally limited in their powers of coding and categorizing. Schopler (1966) found that, unlike mentally retarded children, autistic children have a particular
cognitive deficit that involves language and central coding processes. Others have also found autism to be associated with specific cognitive deficits (Gillies, 1965; Tubbs, 1966). As a result of these studies there is no doubt that autism and retardation differ. However, evidence indicates that two-thirds to three-fourths of all autistic patients will perform throughout life at retarded levels (Hingtgen and Bryson, 1972). Therefore, mental retardation and autism can clearly coexist (Goldberg and Sopher, 1963).

**Autism and Schizophrenia**

The differences between the autistics and schizophrenics are numerous. The schizophrenic child is not usually unresponsive to his environment and he does not demonstrate many of delays in development that are typical of the autistic child. The schizophrenic child often has the use of language but expresses his ideas in a bizarre or unusual manner. The autistic child usually does not have the hallucinations, delusions, and incoherence present in schizophrenia.

Rutter and Lockyer (1967) found that the lower functioning autistic adults more closely resembled retarded persons than adult schizophrenics. Some investigators felt that autism peaks in infancy and schizophrenia in adolescence (Makita, 1966; Vrono, 1974). They also felt that there was more evidence of remission and relapse in schizophrenia. They felt that the course of the two was different in that autism was more consistent than schizophrenia.
(Rutter, 1974).

There is some evidence that these two disorders are not separate entities but on a continuum. There are reports of typically autistic children, as adults, exhibiting clinical signs of schizophrenia (Bender, 1969). Also, some autistic preschoolers, when they reached the ages of 8 to 12, have displayed a clinical picture that fits the criteria of childhood schizophrenia (Brown and Reiser, 1963).

It is important, therefore, that clinicians understand the descriptive elements of the two terms. This understanding is essential not only for diagnostic purposes, but also for future research and treatment of the two diseases.

Autism and Hearing Impairment

The history of the child will help determine the differences between autistic and hearing impaired infants. The hearing impaired child will often have a history of responding to loud noises, whereas the autistic child will often not respond to close loud noises, but will pick up on noises that are much harder to hear. For example, an autistic child may hear someone open a cookie jar in the next room, but appear not to hear a book slammed down next to him. A deaf child consistently only hears the loud noises. It would almost seem that the autistic child has deliberate selective hearing.

Deaf children may seem to act as if they were retarded or even autistic. Usually, however, the hearing loss is
diagnosed by an audiologist or pediatrician and rarely is such a child sent to a psychiatrist. One, usually, can determine, in evaluating deaf children, that they react to persons and environment but fail to react to sounds (Easson, 1971).

**Autism and Developmental Language Disorders**

Comparative studies clearly demonstrate the marked differences between autism and developmental aphasia (Rutter, 1978). Both are accompanied by abnormal responses to sounds, delay in the acquisition of language, and difficulties in articulation (Churchill, 1972). However, unlike autistic children, the aphasic children use appropriate gestures when communicating and make social contact with their environment. This behavior includes the use of eye contact and nonverbal gestures and expressions. They are also sensitive to the gestures and expressions of others, and can learn to point toward desired objects. When the autistic child acquires language it often takes the form of delayed echolalia and has very little communicative intent or emotion. It is not true of children with language disorders (de Hirsch, 1967).

The major conditions that infantile autism must be differentiated from according to DSM III are listed in Table 2 along with major differentiating features. They were also the ones discussed in the above section.
Table 2. DSM-III Differential Diagnosis of Pervasive Developmental Disorders: Major Differential Features

Listed in DSM-III

Axis I

Infantile autism vs. childhood onset pervasive developmental disorder

Former onset before 30 months of age and latter after 30 months of age—chief differential criterion

Pervasive developmental disorders vs:

1. Mental retardation
   a. Full syndrome PDD rarely present
   b. When both disorders present, both diagnoses should be made

2. Schizophrenia in childhood
   a. Hallucinations, delusions, incoherence present

3. Hearing impairment
   a. History of responding only to loud noises
   b. Audiogram indicates deafness or hearing impairment

4. Developmental language disorder, receptive type
   a. Eye and social contact made
   b. Appropriate gestures used
Chapter IV
Specific Treatment Centers

Better educational services are slowly becoming available to the autistic child within the community. Such programs could include detailed assessments of the child's intellectual abilities, sensory and cognitive deficits, language ability, emotional maturity, and behavioral problems. Such programs should take into account the child's skills and attributes as well as deficits, and an individualized curriculum can be developed around these strengths and weaknesses.

The following programs were observed by the author and will be presented in overview: Indiana University Developmental Training Center (DTC) Autistic Program, TEACCH Program of North Carolina, the Judevine Center Program, and the Louisville Program for Pre-school Children.

Indiana University Developmental Training Center (DTC)

This facility is located in Bloomington, Indiana, and has been working with autistic children for over 20 years. It basically follows a behavioral approach, but at times includes educational and humanistic approaches. The curriculum at the DTC is designed for each individual child, but independent skills are stressed for all. The children
learn their routines and are expected to perform with minimal help. Physical assistance is faded to touch cues, then to verbal cues, and reinforcement is paired with performance until the tasks become reinforcing. Attending is always taught through the task, starting at whatever level is necessary. Some "nonacceptable" behaviors that do not interfere with learning are ignored. As more sociable behaviors are learned, many of the inappropriate behaviors begin to disappear.

Communication is stressed all day at the center. Whether the children are verbal or non-verbal, all communicate. Some develop skills with communication boards, some sign, and others develop a better use of verbal language. One girl used a typewriter as a means of communication.

Gross and fine motor development, self-help skills, readiness and academic skills are all part of the program, depending on the needs of each child. Medical concerns, such as nutrition, medication and desensitization programs also become part of the total plan as needed. Often, there are trips into the community, so that the children are able later to accompany their families on such outings.

The clinicians also teach social skills. The autistic children learn how to play with toys, how to play by another child, how to take turns, and how to watch someone else. Time is provided for the children to explore, play and be by themselves. Some self-stimulating behaviors may have to be
accepted at this time; but as long as the children are progressing, and not hurting themselves or others, the caretakers tend to look on these in an accepting way.

All of the children go home on weekends; thus, there are opportunities for the parents to be involved in home programming, parent groups, and individual counseling sessions which are important adjuncts to the autistic child's program. These are necessary components to programs if consistency between home and school and generalization of learning are to be achieved. The partnership that develops through these activities has benefits to the child, the family, and the teacher because each is working toward the same goals and objectives.

The goal of DTC is to place each child back into his or her own school system. When this is not possible the child is often placed in a vocational program. DTC tries very hard to have the child return home, through some means, and tries not to resort to institutionalization.

TEACCH Program North Carolina

The Treatment and Education of Autistic and Related Communications of Handicapped children Program is a program which uses parents as co-teachers and co-therapists. The parents participate both in classroom activities and also carry out specific training activities in the home.

The program is statewide and was established by the North Carolina Legislature in 1972. It consists of five clinical diagnostic and treatment centers located in the
five major population areas of the state and eleven special education classrooms distributed across these regions. Each classroom, located in community schools, provides an educational program for five to eight children. These modified self-contained classrooms provide tailored developmental programs for each child. Children are also provided the opportunity to participate in certain regular classrooms when appropriate to their needs and abilities. The class also serves as a resource room for other children with communication handicaps. These children not only receive instructional help but also provide social interaction for the autistic children. Treatment is sometimes continued in a clinical setting but may vary according to each child's needs. Each classroom is staffed by a teacher and an assistant who are inservice trained by the TEACCH staff. Likewise, the parents are trained by the TEACCH staff so that approaches are similar and continuity is maintained in all aspects of the child's life.

The primary aim to the TEACCH program is to assist in preparing autistic persons to live or work more effectively at home, at school, and in the community, and to prevent unnecessary institutionalization. Special emphasis is placed on helping the autistic person and his/her family to live together more effectively by reducing or removing autistic behaviors. In this way, the autistic person is prepared for placement in a school, sheltered workshop, group home, or other community-based setting.
In recent years TEACCH has gone from emphasizing a behavioral approach to a combination behavioral/educational method. Those who work for the program found that they were able to teach the autistic but were not sure what to teach. They also found that, with a combination of both methods, they were able to make greater advances that were more meaningful to the future lives of the autistic.

Judevine Center Program

This program, centered in St. Louis, provides local services, services for out-of-city and out-of-state children, and a training component for professionals. The program has been in operation since the early 1970's. A variety of severely disturbed children are admitted, including autistic, retarded, schizophrenic, and children with atypical development or severe behavior problems. In the evaluation both the children and the parents are assessed. The primary focus for this assessment and later treatment sessions is based on "social exchange" principles. Parent-child and parent-teacher interactions are carefully recorded, analyzed, and modified where needed. The child's behavior is modified to behavior which will elicit the response they want, whereas the adult's behavior is modified to encourage the production of desired behavior in the child and to discourage or extinguish inappropriate responses.

The areas of training focus on 1) physical aspects such as ambulation and manipulation, 2) social aspects such as rapport, communication, and responsibility, and 3) intellec-
tual aspects such as information, ideation, and creativity. Each child's curriculum is based on deficits or needs in each of these areas. Training areas are broken down into smaller components and specific procedures, which are arranged sequentially. Progress is monitored by definite criteria. In addition to the children in the programs, parents, teachers, and other personnel have expectations mapped out for them.

Each child progresses through five treatment levels, each of which includes more children and takes longer periods of time. For example, level 1, which stresses compliance with instructions, may focus on maintaining eye contact. Such sessions may last only twenty minutes and are conducted in a 1:1 ratio. More complex levels, such as level 4, may focus on competitive play or completion of tasks without supervision. A class for level 4 training may involve only one teacher to five students, and each session may last three to five hours.

The parent training program typically lasts three weeks (90 hours of training). The program consists of observation, didactic material, assistance in applying the skill, and, finally, the parent applying the skill independently.

**Louisville Pre-school Program**

A basic assumption of this program is that the autistic child needs more normal models. Therefore, the child is placed in an activity where the ratio is two "normal" children for every autistic. The normal child acts as a role
model and often encourages the autistic to participate in the activity.

The curriculum of the pre-school consists of sequences of developmental tasks aimed at improving the child's functioning in four major areas: 1) behavior, 2) communication, 3) socialization, and 4) pre-academics. Each child has an individualized lesson plan and is encouraged to go as far as possible in each of the above areas. With the exception of communication the skills are taught in a group setting. The facility has speech therapists that work individually with the autistic student on language.

The Louisville program is different from the other three in that it does not encourage parent participation in the school setting. The director of the program feels that the time the child spends in school should be a time of respite for the family. They do teach the parents behavior methods to help deal with the problems that arise at home and offer support through parent groups.

Devereux Foundation

Devereux is located in Phoenix, Arizona, and works with emotionally disturbed children. The children that lived at Devereux had a variety of disturbances, which ranged from behavioral problems to autism. The staff was not trained to work with psychoses. Therefore, little was accomplished with the autistic children.

The autistic children went to a special school weekdays and were taught by a special education teacher, not trained
to work with autism. The teacher initiated a behavioral program, after she read some studies done with autistics. With this approach small improvements were made in the behaviors of these children.

At Devereux, there was no goal to get these children back into society. The autistic children at Devereux were profoundly retarded and would more than likely remain institutionalized. The main objective of the staff was to teach the children to function well in an institution.

Summary

There seemed to be quite a few similarities in the programs visited. All emphasize that the earlier the intervention, the more potential for improvement there is. They also stress that self-abusive behaviors will not develop or be easily extinguished if other means of communication are available to the autistic child.

All the programs used some form of behavior modification, especially when trying to terminate behaviors that interfere with learning. An educational approach was turned to as a means of determining what to teach once behavior was reasonably under control.
Chapter V
Treatment Approaches

There is no known cure for autism. However, there have been many successful attempts at reducing or extinguishing behaviors that are thought undesirable and that interfere with the child's ability to learn. Many researchers have also found ways to improve these children's ability to communicate and participate in the activities of the world around them.

In this section, the researcher will look at three different methods that are used in the treatment of autism, psychopharmacological, educational and behavioral. The psychopharmacological approach deals with the treatment of autism through the use of drugs. The physicians that use this method feel that autism is caused by a chemical imbalance and can be cured if the right drug can be found to restore that balance. Persons using the educational model try to teach the autistic child new methods for learning the material that is hard for them to grasp. The behaviorists try to eliminate the behaviors that interfere with learning and the ones that are not acceptable to society. They accomplish this through a variety of methods. Once they eliminate inappropriate behaviors, they can concentrate on
teaching new and acceptable ones.

**Psychopharmacological Approaches**

Several studies have reported results for the comparison of treatment effects of different psychopharmacological agents. Faretra, Dooher, and Dowling (1970) found haloperidal and fluphenazine equally effective in producing overall improvement in a group of hospitalized psychotic children. Both drugs are used in the treatment of psychotic disorders. Medication was randomly assigned to patients and was identical in appearance, neither the patient nor rating psychiatrists knew the identity of the drug. Mental status examinations were completed by two or three psychiatrists pre- and post test. A final common rating was obtained through joint consultation. Both drugs were found to reduce anxiety, but neither reduced regressive behavior. Haloperidal was faster acting and also reduced provocation and autism.

Claghorn (1972) compared haloperidal and thioridazine. Thioridazine is also used with psychotic patients and is considered an antidepressant. Patients were randomly assigned to treatment conditions and medication was dispensed in identical appearing capsules. A general behavior rating was obtained pre- and post test for patients through completion of a checklist of home behavior by parents and global physician ratings. Both drugs were found equally effective in controlling symptoms associated with psychosis, and with behavioral difficulties and retardation.
in the control group of outpatient children. Haloperidol was particularly effective during the time when children completed their daily homework assignments.

Engelhardt, Polizo, and Waizer (1973) reported flu-phenazine and haloperidol indistinguishable in effectiveness with a group of psychotic children who were not primarily brain damaged or retarded, or psychotic and attending public schools. Behavioral course was blind rated by two psychiatrists using two general psychiatric instruments, the Clinical Global Impressions Scale and the Children's Psychiatric Scale.

Haloperidol and behavior therapy were studied by Campbell, Anderson, Meier, Cohen, Small, Samit, and Sachar (1978). Haloperidol was clearly superior to a placebo in controlling withdrawal and stereotypic behavior. It was also found to increase appropriate orienting reactions (Cohen, Campbell, Posner, small, Triebel, and Anderson, 1980). Concurrent behavior therapy and haloperidol seemed to produce good results, although it was not clear if the drug facilitated learning in a direct or indirect fashion.

Waizer, Polizos, and Hoffman (1972) reported thiothizene, also an antipsychotic, effective in treatment of an outpatient group of schizophrenic children. Children were diagnosed according to the criteria of the British Working Party. Behavior ratings were completed by a single psychiatrist using the clinical Global Impressions Rating Scale.

Drug treatment is difficult to assess because of the
many side effects and the inconsistency of results achieved by certain drugs. The drugs that appear to be the most beneficial are the non-sedating antipsychotics.

Behavior Modification Programs

During the last 10 years, the most significant development in the treatment of infantile autism has been the continued growth in the use of behavioral/educational approaches. This development has been due to the generally accepted position that traditional forms of psychotherapy have not been effective in reducing the severe behavioral deficits associated with this syndrome.

Browning (1971) hypothesized that implementation of intensive individualized behavior modification programs for five hospitalized autistic children would enable them eventually to return home. Accordingly, individual behavior modification programs stressing social and language behavior were devised for each of the children. Children were administered the Vineland Social Maturity Scale and the Stanford-Binet, form L-M (Terman & Merrill, 1960), before and following the treatment program.

All children made varying degrees of progress. However, continued placement in a highly structured setting was necessary to maintain treatment gains. Response acquisition did not facilitate learning of new behaviors and retrieval of previously learned behavior remained problematic. The five children were initially untestable and scored in the retarded range at follow-up. Basic learning deficits, such
as failure to alert and maintain attention, isolation and stereotypic behavior, remained.

Research results are obscured by the use of the Binet, a verbal test instead of a performance test. This procedure in itself, may account for initial untestability. The children were not profoundly retarded as demonstrated by their scoring in the retarded range at follow-up. The fact that treatment was conducted in a structured setting without having adequate provisions to assure generalization of treatment effects to different settings, persons, and stimulus classes, probably accounts for failure to maintain treatment gains outside the training setting. Nonetheless, the fact of testability at follow-up indicated that limited generalization did occur.

In a much more sophisticated research program, Lovaas, Koegel, Simmons, and Long (1973) attempted to provide an approximation of changes that would be seen in autistic children undergoing behavior therapy, focusing upon changes in stimulus generalization, response generalization and durability of treatment effects. Subjects were autistic children who had received several diagnoses, such as mental retardation or brain damage, and were described as being from the lower half of the psychotic continuum. Thus, the probability of significant improvement in these children was extremely small. Half the children were mute, the remainder scholastic.

Treatment proceeded from suppression of undesirable
behavior and establishment of therapist stimulus control to introduction of the language training program, which consumed about 80% of the time children spent in treatment. Shaping procedures were used in speech training as well as for increasing "normal" or age appropriate social behaviors. Reinforcers were selected on the basis of their value for a particular child. Before and following the treatment program, children were tested with the Vineland Social Maturity Scale and Stanford-Binet. In addition, multiple response recordings were made of self-stimulation, echolalia, appropriate speech, social nonverbal and play behavior.

The treatment program resulted in a decrease in self-stimulation and echolalia and increases in appropriate speech, play and nonverbal social behaviors. Spontaneous social interactions and use of language occurred about eight months into the program for some children. Improvement in IQ and Vineland SQ also occurred. Although all children improved, some did so more than others.

At follow-up, one to four years after conclusion of the program, children who were at home with parents trained in behavior therapy continued to improve while institutionalized children regressed. However, in the case of institutionalized children, a brief reinstatement of behavior therapy reestablished some of the treatment gains. This study demonstrates that use of appropriate procedures can increase the generalization of treatment effects in behavior
therapy. Furthermore, generalization to the home environment can be accomplished with training of the parents while regression occurs with institutional placement.

Many other workers have had success with expanding verbal skills in autistic children which is similar to that reported by Lovaas' group. Halper (1970), for example, studied 15 children over a 4-year speech treatment period. When the children started the program, nine were completely nonverbal and six showed some minimal verbal output. By the end of the treatment, 13 of the children demonstrated useful speech to the degree that 11 of these were subsequently enrolled in special public school classes. Using prompting and fading procedures, Marshall and Hegrenes (1970) worked with four previously nonverbal autistic children and successfully developed object name and description skills.

Although there are usually substantial gains in verbal output with the use of behavior modification techniques there still seem to be only a small number of cases that actually acquire true language (Lovaas et al. 1977). Behavioral methods still seem to be the most effective when dealing with the overall management of an autistic person (Koegel, Egel, and Dunlap, 1980).

**Educational and Developmental Approaches**

In a study reporting effectiveness of an educational program for autistic children after one year (Fischer & Glenville, 1970), a group of children, similar to that of Rutter (1967) but seen at a somewhat later age and having a
higher proportion of children with an IQ under 50, was examined before and following treatment with well standardized tests. An educational program was used in conjunction with operant procedures in which a training stimulus was paired with a prompt and positive reinforcement. Then the prompt was faded until the training stimulus was capable of eliciting the correct response.

These behavioral techniques were used in conjunction with the Frostig program of perceptual development (Frostig, 1964) and sensory motor portions of the Montessori program (Montessori, 1964), both training programs for the learning disabled child. The Pre-Frostig program consisted of a pool of 150 items arranged in order of ascending difficulty so that previously learned behaviors were contained in succeeding items of ascending difficulty. The "position in space" section proceeded from naming body parts on command to differentiation of right and left. At the beginning of the program and at the end of the experimental year, children were examined with the Frostig developmental test of visual perception.

At the close of the year, the majority of children had completed only 10% of the program and the Frostig perceptual quotient remained unchanged. This low success rate may be related to the fact that 72% of the children possessed an IQ under 50 as well as to the questionable applicability of special programs developed for learning disabled children. This study confirms the necessity of recognizing the
autistic child as being in need of specialized treatment with procedures developed specifically to meet his/her needs.

Children with serious autistic behavior accompanying retardation and/or organic brain damage were enrolled in a special education program to determine the effectiveness of a group language training program using operant conditioning and communication therapy (Halpern, 1970). It was assumed that autistic children are intrinsically incapable of communicating normally and that deviant behavior, rather than reflecting organic brain pathology, is largely related to difficulties potentially inherent in any blocked interpersonal transaction.

It was further assumed that the functions subserving information processing are inadequate, suggesting over organization of the child's environment as a corrective measure. This procedure means that what the child heard and saw was identified in its most elemental form for him/her and was brought to his/her attention repeatedly until primitive vocal patterns and relationships were established. School experience was so structured that it became nearly invarying. Small changes in speech and behavior shaping were effected gradually. Classes were small, and the children were taught in a group setting: sitting in a semicircle for two hours a day. In addition to classroom experience, there was free play, rest, musical instruments, and snack periods each day.
After four years in the program, 73% of the children were enrolled in public schools and four were in residential facilities. Initially, nine of the 15 children had no useful speech and six had only rudimentary vocal output; at follow-up all children in school and three in residential settings had communicative speech. However, of all the 11 children in school, eight were in special classes and only three were in regular programs.

It was concluded that the program was successful because, in addition to stated treatment goals, auditory stimulation was linked to remembered experience in patterning cognitive relationships which could be learned and expressed orally. However, program structure alone could account for improved response acquisition. No data were reported in support of the cognitive patterning hypothesis. The structuring of the environment in context of the peer group also aided in the socialization process. Finally, the public school system was able to follow-up with a continuation of highly structured educational programs for the children.

Results of this study again demonstrated that children with initially poor prognosis due to mutism, multiple diagnosis and possible mental subnormality could make significant gains in language development and social adjustment. In addition to those factors already presented, increased length of treatment, increased discrimination and acquisition of verbal and social behaviors due to over
structuring of the environment, all help to account for the success of this interesting program.

An even more innovative treatment strategy was devised by Miller and Miller (1973) to teach mute autistic children sign language. It was hypothesized that acquisition of sign language would eventually lead to use of vocal speech.

Assumptions were that language and cognitive development follow a regular progression (Piaget, 1954) during which children first learn to direct their body actions, then their distal senses, and finally their goal directed language and thought. Development of this directed body action provides the basis for later intentional action, a more symbolic process. Because autistic children do not attain directed body action, learning of symbolic material is precluded. This deficit is due to the manner in which they become "captured" by their total body response to single events, these "captured" sequences then becoming incorporated in isolation from one another. As an example, a child learning to adapt his body to broken terrain while on a hike might continue in this behavior without actually directing his body to continue the hike. There is no awareness to the body as a separate entity in relation to external goals.

To accentuate the autistic child's body awareness and thus aid the learning process, it was assumed that having children walk on elevated boards would aid in the perception of body boundaries. This procedure would then enable
children to learn initiated directed action as a prerequisite to relating body actions and spoken language.

Training consisted of having children walk on elevated boards to heighten body awareness and increase goal directed behavior. On the boards were obstacles boards which the children had to remove or step over in order to progress. Other situations encountered included bridges and doors. Boards and obstacles were continually rearranged to prevent the ritualization of intentional acts, or in behavioral terms, to assure generalization of problem solving behaviors.

Once intentional behavior had been established, 50 functional signs resembling the action described were introduced from American Sign Language. As an example, while children were on the boards, therapists instructed them to "walk" verbally, while presenting the sign for walking. Eventually, children were required to initiate signs themselves, as in the case of opening cupped hand so therapists would open doors obstructing the elevated boards. Children were also shown training films pairing sign language with actions to be performed.

Upon conclusion of treatment, all children could respond appropriately to signs paired with spoken words and to spoken words without signs. It was also found that pairing signs with spoken words enabled the children to understand word meaning. Children were less able to respond to two word combinations and used significantly fewer signs.
expressively than receptively. The use of signs generalized to unfamiliar situations. Language improvement was significantly correlated with months in program. Younger children were significantly more likely to understand both expressive signs and words. Children with more severe British Working Party Scores did significantly worse.

This study again demonstrates that even mute autistic children can make significant behavioral gains in a well designed and comprehensive treatment program. Treatment goals were accomplished through the application of behavioral techniques in conjunction with specialized training. Marked improvement of children involved in treatment at an early age is again reported in this study.

The behavioral/educational approach to working with the autistic seems to be the approach used today with the most frequency and success (Egel, Koegel, and Schreibman, 1980). However, the therapeutic advances usually do not result in a change in the overall poor prognostic outlook for most autistic children (Prior, 1979).

Study of Treatment Approaches

On the basis of previous research, Wenar and Ruttenberg (1976) hypothesized that in comparing general treatment considerations custodial care would be found least effective while residential care would have no absolute advantage over day care. It was also hypothesized that the major therapeutic thrust of a given program and the manner in which it is implemented would be as significant as the specific
treatment utilized.

Eight treatment programs for autistic children were objectively assessed. Each of the programs was rated for factors such as population size, condition of physical plant, contacts, adult influence or attitude toward the children, peer interaction, nonhuman stimulation and typical daily program and schedule. An objective behavior rating scale, the "behavior rating instrument for autistic children" (BRIAC) (Ruttenberg, Dratman, Fraknoi and Wnear, 1966), was used to evaluate patient behavioral change in each of the programs over a one-year period. Behavior classes described in completing the scale are relationship, communication, vocalization, speech, sound reception, social functioning and body movement. Behaviors such as undirected rage and self-stimulation were grouped under the label "psychosexual development," making it unclear what other behaviors might be included in this classification.

Inter-rater reliability for the eight behavior classes ranged from r = .85 to r = .93, a reasonable level of agreement. Because sufficient neurological and psychological data were infrequent, the determination that children in the sample met Kanner's original criteria (who were neither neurologically abnormal nor retarded) was based upon observation alone.

Treatment approaches represented in the study were behavior modification, education, psychoanalytically orientated relationship therapy and activity therapy.
However, behavior modification and education were similar in method. It was found that preschoolers were more severely disturbed than older children and improved more rapidly when in treatment. The custodial care unit was least effective in producing change, but this was the only facility that could not be selective in regard to admission, and thus may have been composed of selected subgroups. No difference in effectiveness was found among the four treatment approaches represented. However, in the comparison of the two programs utilizing behavior therapy, there was a trend for the program emphasizing punishment of self-stimulation to produce less improvement on the psychosexual scale than the program which stressed diversion from such activities. However, programs which were better implemented were found to produce significantly more change than those with delivery deficiencies.

It was concluded that, in practice, few differences are observed between treatment methods because all therapies deliberately or inadvertently use some form of contingent reinforcement when confronted with the problem of the autistic child. It is important to note that in using BRIAC, children were assessed for frequency of autistic behaviors without similar measurement of the appearance and frequency of normal or age appropriate behaviors. This assessment would be an especially relevant consideration in evaluating behavior therapy programs. The difference in effectiveness of the two behavior therapy programs cannot be explained on
the basis of available data, but could be due to differences in implementation.

In a study conducted by Ney, Palvesky, and Markelye (1971) it was found that operant conditioning produced significant increases in mental age while play therapy did not. Not only did the mental age increase, there was also the acquisition of more socially appropriate behavior with this method.

Treatment Based on Symptoms (Behavioral)

The last part of this paper will include methods that have been found successful in treating one or more aspects of autism. It will also include a review of some of the procedures currently being used in facilities that care for autistic children. Such interventions, while they may not produce "normalcy," can go a long way toward making it easier for the autistic child to live at home and be part of his or her community.

Self-Stimulation

Self-stimulation is one of the most difficult problems to deal with when treating psychotic children. These behaviors include "mouthing" (placing objects and body parts in the mouth), hand-flapping, body rocking, spinning of objects and themselves, and masturbation. Newson, Carr, and Lovaas (1977) found that these behaviors were very resistant to change and do not seem to have external causes. A number of positive side effects have been observed when self-stimu-
lath behaviors were reduced. It was found that autistic-like children became more social and attended better when self-stimulation was suppressed (Risley, 1968; Lovaas and Newson, 1976). Koegel et al. (1974) found that appropriate play increased, and another group (Koegel and Coverts, 1972) reported an increase in ability for discrimination learning. These findings point out how tragic it is that such behaviors are so resistant to extinction. Methods that can eliminate or reduce these behaviors are of great importance.

One study conducted by Rincover (1978) showed that by removing the sensory reinforcement of various self-stimulating behaviors, these behaviors could be reduced or eliminated. Three developmentally delayed children who displayed large amounts of self-stimulating behavior participated in this study. One child gained auditory feedback from plate spinning; the other two received proprioceptive stimulation from finger flapping and object manipulation. All three received visual feedback from their behaviors.

To extinguish the behavior of plate spinning, carpeting was installed on the table where the child usually spun plates. Similar methods were used in reducing the other behaviors. Blindfolds were used for visual feedback and vibrators masked the proprioceptive stimulation. All behaviors were reduced and most were extinguished.

In another study self-stimulating behaviors were reduced most effectively by means of overcorrection (Foxx and Azrin, 1973). This study compared five methods that are used
in trying to eliminate these undesirable behaviors. These were the procedures compared:

1) Free reinforcement: Here the teacher gave the child a treat at irregular intervals, regardless of the child's behavior.

2) Reinforcement for non-mouthing: The child was given verbal praise and edibles whenever 10 seconds elapsed without the undesirable behavior occurring.

3) Punish procedure: The child was slapped hard enough to cause distress when engaging in the "bad" behavior.

4) Distasteful solution: A bad tasting solution was painted on the child's hand in order to eliminate mouthing.

5) Overcorrection: Since mouthing objects or parts of your body causes you to be exposed to potentially harmful germs, the method used should help eliminate these microorganisms. Therefore, when the behavior occurred the child was told "No" and was instructed to brush his teeth and wash his face.

Of the methods used overcorrection was the most effective in extinguishing the mouthing behavior.

In order to eliminate mouthing on the part of two autistic/retarded boys, Wells, Forehand, and Hickey (1977) studied the effects of a verbal warning, such as it is used in overcorrection. They found the verbal warning by itself eliminated the behavior in one of the children and reduced it in the other.

The investigators felt that the reduction of undesir-
able behavior was less in the one child because of his lower intellect. The results indicate that for lower functioning children it may be necessary to begin by pairing aversive stimulation with the verbal warnings.

Overcorrection was again used by Well et al. (1977) to reduce self-stimulating behaviors. These behaviors included inappropriate object manipulation, mouthing, inappropriate hand movements, and other inappropriate behaviors (e.g., masturbation and body rocking).

In this study positive practice was preceded by a verbal warning. The name of the child was called out along with an order to stop the behavior currently being displayed. The child was then manually guided through 2.5 minutes of appropriate play. When the child reached the point where he played correctly, the manipulation was stopped. However, the child was watched carefully for any lapses. Results showed that overcorrection reduced all stereotypic behaviors displayed in both children. In addition, one child showed marked improvement in appropriate toy play.

In a more recent study done by Harris and Wolchik (1979), four boys with autistic-like behavior were treated for self-stimulatory behavior with three different treatment procedures. These methods included time-out, differential reinforcement of other behavior (DRO), and overcorrection. As was the case with Foxx and Azrin (1973), overcorrection was the most effective in reducing unwanted behaviors with
all four boys. Three of the four showed "some evidence of decrement in responding with time-out." The DRO procedure worked with only one child and that was a modest decrease.

During DRO the child was rewarded for not engaging in self-stimulation by either food or stroking by the tutor. When using overcorrection the tutor stopped each episode of self-stimulation by a stern "No hand play" and guided the boy's arm over his head and briskly clapped his hands for 10 seconds. With time out the tutor again said "No hand play" and then turned his head away from the child.

The above studies would seem to indicate that of the methods of behavior modification used when dealing with self-stimulatory behavior the most effective in extinguishing said behaviors is overcorrection.

The methods used to eliminate self-stimulating behaviors at the facilities visited by the author were varied. At the Indiana University Autistic Program (1983) self-stimulation was often ignored, unless it interfered with learning. With the older children the caretakers tried to teach them when it is appropriate to self-stimulate. For example, the children are taught the difference between what should be done in public and what should be done in private. Masturbation, for instance, is taught to be a privately engaged behavior and the children are directed to go to their rooms or to the nearest bathroom when such behavior occurs. The program often allows a child to engage in self-stimulation during their free time, but they are encouraged
to participate in other activities they enjoy. They never used aversives to try to extinguish the problem. When it interferes with learning they are given a verbal warning and directed back to the task, with the promise of free time later.

The younger children in their care were stopped immediately from engaging in these behaviors and were directed to a new task. There was not a great deal of self-stimulating behavior going on in the pre-school program because they were kept busy in other activities. If the children continued in the undesirable behavior they were placed in a hands-on time out. The staff made sure the behavior was not continued by holding on to the child, but at the same time ignored him the best she was able. The child was then encouraged once again to participate in appropriate play or activity.

At the Louisville Pre-School Program (1983) the children were not observed to have a great many self-stimulating behaviors. The director of the program felt that this was true because of the amount of activity the children participated in. She felt that self-stimulating behavior was a statement of boredom and if the child was diagnosed early enough these behaviors could be averted.

When self-stimulating behaviors did occur the child was brought immediately back to task. If the behavior continued the child was taken away from the activity for a short time-out period and then was taken to a different task. The
reason the child was not returned to the original activity was because it was thought to have bored him.

The TEACCH Program (1983) in North Carolina and the Judevine Center (1983) both use methods of overcorrection in dealing with self-stimulating behaviors. The first step in dealing with such behaviors was a verbal warning ("No hand-flapping") and at the same time manually directing the child back to the task at hand. If the behavior continued then the child was directed in a overcorrection method tailored to the behavior that the child was participating in. For instance, if hand-flapping occurred the child had to clap his hands over his head for a specified period of time. As the consequences of negative behaviors became increasingly time-consuming and unpleasant the children finally cease to show those behaviors.

In all the programs the incidence of self-stimulation were low. The staff at all of the facilities observed that if the child was diagnosed early enough and directed into meaningful activities the need for self-stimulating behaviors was greatly decreased. All felt that boredom and frustration played a major role in the acquisition of these behaviors.

Self-Injurious Behavior

Self-destructive behaviors have been found in a significant number of children that are diagnosed psychotic. These behaviors include head-banging, arm-banging, biting themselves, and beating themselves. These behaviors can be
so severe sometimes that they can cause permanent damage. These behaviors are most frightening to parents and to the general public, and the ones that are most often discussed in the mass media. Fear for the child's safety has led caretakers to turn to straitjackets and drugs in order to control these behaviors.

Self-destructive behaviors can also be psychologically devastating to those persons who are taking care of these children. It is very depressing for the caretakers to watch children bite themselves until they bleed and feel that there is nothing that can be done to change this behavior. A child that is medicated or confined to a straitjacket has little chance of improving or growing in any way. Therefore, it is imperative that ways be found to eliminate such behaviors. As with self-stimulating behaviors, self-injurious traits are very resistant to treatment. There have been, however, some successes in this area and the following section will present some helpful ways in dealing with these inappropriate behaviors.

Lovaas and Simmons (1969) conducted two studies whose purpose were to find conditions that would control self-destructive behaviors in children. They found that two procedures effectively extinguished the destructive behaviors. The methods used were extinction and electric shock.

In the electric shock experiment a painful, but non-injurious, voltage was administered when the child engaged
in destructive behaviors. It was found that the self-destructive behaviors were immediately extinguished while the shock was present, albeit they returned once the shock was removed. It was also discovered that the effects of the shock were situation specific, with regard to location and those persons administering the treatment. Once the child was out of the treatment room and away from the experimenter the behavior returned.

It was also discovered that once the destructive behaviors decreased, there was an increase in socially acceptable behavior, such as eye contact and physical contact. In conclusion, it was suggested by the authors that in order for generalization to occur the shock treatment must be administered in different settings by a variety of persons.

The above findings were supported by a similar study conducted by Corte, Wolf, and Locke (1977). Once again it was found that electrical shock suppressed destructive behaviors in all the subjects. The results also were in agreement with the study done by Lovaas and Simmons (1969) in that the effects of the punishments were usually specific to the setting in which they were administered. Here again it was felt that in order for the treatment to generalize it was necessary to carry out the treatment in many of the settings in which it occurred. These studies confirmed the earlier findings of Risley (1968).

Electric shock seemed to be very effective in the above
studies in reducing self-injurious behaviors (SIB). However, there are many ethical and practical issues that need to be looked at when dealing with electric shock. Azrin (1960) and Birnbrauer (1968) both found that after repeated application of the punishing shock, the subjects appeared to adapt to the shock and the punished response recovered. Romanczyk and Goren (1975) reported that while shock may be effective in some cases of SIB, it did not lead to extinction in others. In light of these findings and the reluctance of many caretakers to use shock with children, it appears desirable to seek alternative methods for the treatment of SIB.

One of the alternatives is the use of extinction. This method was used by Bucher and Lovaas (1968) and Lovaas and Simmons (1969) and was to control SIB. Extinction is a procedure in which the children are left on their own, with no restraints and no attention given to self-destructive actions.

There are some problems with this method also. In one of the above studies the child did go to extinction by the tenth session, but he had also hit himself in excess of 10,000 times. Also, it was found that extinction in one location did not affect his self-destructive behavior in other situations.

Time-out, as a method of reducing SIB, has similar problems to that of extinction. It can provide an opportunity for the child to engage in SIB and may actually
increase the undesirable behavior rather that reduce it. However, when SIB was prevented during time-out (hands-on) in a study done by Solnick, Rincover, and Peterson (1977) they effectively reduced the destructive behavior.

Differential reinforcement of other behavior (DRO) led to a reduction in SIB when Corte, Wolf, and Locke (1971) used it. However, due to length of treatment required, there was too much physical damage to consider it successful. The children in the study were considered extremely self-abusive and retarded. The authors felt that, perhaps with a more intelligent and less destructive population, this method may be feasible.

Harris and Romanczyk (1976) reported a dramatic decrease in SIB with use of overcorrection. The child in their study was a head and chin banger. When he participated in such activities he was guided in a head and arm moving exercise. He was then returned to the task that was interrupted. He would have to attend to that task until he got one answer correct before he was allowed to terminate said task.

Edward Carr and associates (Carr, Newsom, and Binkoff, 1976) found that self-destructive behaviors decreased in low demand situations and increased in high demand situations. The authors felt that the SIB was often used to get out of an unpleasant situation. They thought it was important that the child not be allowed out of the situation, thus reinforcing the behavior. They also thought the circum-
stances should be changed so that they becomes less stress-
ful for the child.

Finally, a study done by Dorsey et al. (1980) outlined a procedure in which water mist was used in controlling SIB. In this study a fine mist of water was sprayed in the face of the child displaying SIB. Two experiments were conducted. In the first, a mild verbal punishment was used ("No") in an attempt to control the behavior. In the second, the "No" plus the mist procedure was used.

It was found that "No" only controlled the SIB after it had originally been with the water mist. "No" then could be extended to other situations in which the water mist had not been used.

In two of the institutions this author visited there were no self-injurious behaviors present. Both the Louisville and Indiana programs stressed that their children had been helped at an early enough age that these behaviors did not develop. The preschool children were taught other ways to communicate their needs and did not need to resort to such behaviors.

The Judevine program emphasized taking whatever steps were necessary to stop such behaviors. They started out with procedures such as restrained time-out and overcorrection, but were willing to use shock if necessary.

The TEACCH program used a verbal warning ("No") and redirected the child back to acceptable behavior. If the child continued to hurt himself the verbal punishment was
administered again and the child was physically restrained. In an institution where the author worked (Devereux, 1980) a child with SIB was taught to stop biting his hands and arms with a command of "put your hands down." The command, however, was first paired with shock at a different facility which the child attended before coming to Devereux. The method generalized to a new location and different situations.

Harris (1983) from Douglass University uses techniques such as spraying water mist in a child's face and restraining the child by crossing his/her arms and holding them back of him/her. Harris, however, feels that if after a week or so behavior change is not seen, the water treatment is discontinued.

All the persons interviewed for this paper felt that self-destructive behaviors stemmed from a frustrated attempt to communicate the child's wants and needs. Once another means of communication was open to them these behaviors often receded or were never established.

Communication is a major problem with autistic-like developmentally delayed children. That is why the next portion of this paper is devoted to dealing with problems of language in these children.

**Language Disorders**

Since the acquisition of speech is usually learned through imitation, it is first necessary to get a child to attend to his teacher. Since lack of eye contact is one of
the characteristics of autism, it is often a difficult procedure to establish.

The most commonly used procedure to increase attending behavior is to place the child and instructor very close to each other in an open space, using the tutor's legs to keep the child from leaving. This procedure was used by Lovaas et al. (1966) and resulted in a dramatic increase in attending behavior.

Another procedure used to a great extent is one where the instructor and child are placed in a booth (Hewett, 1965; Blake and Moss, 1967; and Fineman and Perjo, 1969). This method almost assures that the child will be facing the experimenter when the stimulus is presented. It is probably a less popular method because of the inconvenience of having to have a booth.

In both of these procedures the attending behavior rewarded by verbal praise and food is usually used as a tangible reward. To get the child to attend the reward is usually placed in front of the teacher's face and a command of "Look at me" is given. Once the child complies he is given the reward.

Once the child is able to pay attention to the teacher, he is taught verbal imitation. The first step in this procedure is to reward all vocalizations. Next vocalization that occurs soon after the teacher has spoken is reinforced. Then if the child tries to imitate the sounds spoken by the teacher he is rewarded. Finally, the teacher introduces more
sounds and if the child imitates these he is again rewarded (Lovaas et al., 1966).

Once the child is able to imitate verbal sounds, the next aim is to establish functional language. Generally the subject is first taught noun labels and then other forms of grammar.

Lovaas and co-workers (1973) were able to develop more spontaneous speech by using a shaping process. This method included the labeling of objects, which was accomplished by prompts and then fading of these prompts. The object that was being taught was then used in context in a simple sentence.

Also using prompting and fading techniques, Marshall and Hergrenes (1970) reported success working with nonverbal autistic children when developing object naming and description skills.

A few researchers have been able to develop more complex language behaviors, such as simple and compound sentence usage (Stevens-Long and Rasmussen, 1974).

Unfortunately, the above procedures do not work for all children. The echolalic child, for instance, uses verbal imitation inappropriately. Instead of responding to the question "Do you want a cookie?" the child repeats the question. Carr, Schreibman, and Lovaas (1975) reported that echolalia resulted when the child was uncertain how to respond to the verbal stimuli. Therefore, it was necessary to teach the correct response to the stimuli presented. This
experiment supported an earlier study done by Lovaas et al. (1973) in which shaping procedures were used to teach the correct response to echolalic children when asked a question.

There are also children who, no matter what method used, do not develop language. Sign language is often used as an alternative for these children. Carr et al. (1978) developed a system for teaching autistic children sign language through prompting, fading, and stimulus rotation.

The method that was used by Miller and Miller (1973) to teach sign language to autistic children was explained in the "Educational and Developmental Approaches" section of this paper.

The programs visited by this author were very similar in their approach to teaching language skills. The first step was getting the child's attention, which was accomplished in one of two ways. The Louisville program used a booth, where the child and speech therapist were seated across from each other. Rewards were given to the child when he attended to the adult on a command of "Look at me."

The other programs (Judevine, TEACCH, and Indiana) subscribed to the method used by Lovaas (1966), which was presented earlier in this paper. There were slight variations in the procedure, such as placing a table between the child and instructor (Indiana), but the general idea remained the same.

The second step was verbal imitation. Again, all the
facilities followed the general plan set forth by Lovaas (1966) which was presented earlier. To elicit verbalizations in a mute child, different methods were used by the teachers at each place. The methods used were tickling and pinching (TEACCH and Devereux) and manual prompting (Louisville and Indiana). Any sound made by the mute child was promptly reinforced.

Verbal imitation after the teacher had spoken was rewarded by all the facilities as the next step in language development. It was not necessary for the child to correctly imitate at this point.

Next the child was rewarded if he came close to imitating the teacher. Eventually, correct sounds were the only ones that were reinforced.

Nouns were the first things taught to the child, and most places used a prompting and fading technique as a way to get the child to verbalize the name of the object presented. Gradually, more and more objects were introduced.

There is some debate as to whether or not grammar should be taught to the child at this time. TEACCH feels that it is more important to continue learning labels for objects than it is for him to expand into verbs, etc. They feel that the child gains nothing if he can say "more cookie" rather than just "cookies." They contend the result would be the same (the child gets the cookies).

On the other hand, we live in a society that speaks within a certain set of guidelines; and some clinicians feel
that it is necessary for these children to learn as many facets of the English language as possible (Indiana and Devereux). Whether or not to proceed to grammar instruction will have to be determined by how well the child is responding to instruction and whether the teacher feels that there will be something gained in the instruction.

As was stated before, some children do not respond to the method of instruction stated above and there is a need to teach alternate means of communication.

It is a general belief that an all out effort should be made to teach verbalization to a child until he reaches the age of five. After the age of five if the child does not verbalize then alternatives can be considered.

The most common of these alternatives is sign language. All the institutions visited employed a speech therapist that taught the older children sign language. Since the majority of people in our society do not know how to use or respond to such communication, verbalization is paired with the learning of the sign, if at all possible.

Sign language is the easiest alternative method in communication, but other methods were used. Communication boards were used (Indiana and TEACCH) as were typewriters (Indiana) in some cases. These methods present a problem in terms of convenience and therefore are felt to be a last resort. These methods are, however, infinitely better than no means of communication at all, since that is believed to result in frustrated needs and lead to SIB.
Since there seems to be no all-encompassing cure for autism, this paper includes some alternative methods that have worked with the different symptoms of autism. This author also feels that the term "autism" may be too universal and that these children should be thought of in terms of developmental delay. The clinician can then look at the cluster of symptoms displayed by each child, decide which treatment methods would work, and then apply that treatment. Table 3 presents an outline of autistic-like behaviors and treatment procedures that have been successful in correcting these behaviors. This table, at a glance, should enable clinicians to choose specific procedures for treatment of certain symptoms.
<table>
<thead>
<tr>
<th>Autistic-like behaviors</th>
<th>Treatment Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self-stimulation</strong></td>
<td><strong>Psychopharmacological</strong></td>
</tr>
<tr>
<td>rocking</td>
<td>control of stereotypic behaviors—haloperidol,</td>
</tr>
<tr>
<td>masturbation</td>
<td>thioridazine and fluphenazine (Claghorn,</td>
</tr>
<tr>
<td>hand flapping</td>
<td>1972, Engelhardt et al., 1973, and Campbell</td>
</tr>
<tr>
<td>arm flapping</td>
<td>et al., 1978)</td>
</tr>
<tr>
<td>spinning of objects</td>
<td></td>
</tr>
<tr>
<td>spinning of themselves</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Behavioral/Educational</strong></td>
</tr>
<tr>
<td></td>
<td>removal of sensory reinforcement (Rincover,</td>
</tr>
<tr>
<td></td>
<td>1978) overcorrection (Foxx and Azrin, 1973,</td>
</tr>
<tr>
<td></td>
<td>Forehand and Hickey, 1977, Welbetal, 1977,</td>
</tr>
<tr>
<td></td>
<td>Harris and Wolchik, 1979) timeout (Harris</td>
</tr>
<tr>
<td></td>
<td>and Wolchik, 1979)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Treatment Centers</strong></td>
</tr>
<tr>
<td></td>
<td>overcorrection (Judevine and TEACCH) timeout</td>
</tr>
<tr>
<td></td>
<td>(Indiana and Louisville)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Behavioral/Educational</strong></td>
</tr>
<tr>
<td></td>
<td>electric shock (Lovaas and Simmons, 1969;</td>
</tr>
<tr>
<td></td>
<td>Corte, Wolf, and Locke, 1977, Fate and Baroff,</td>
</tr>
<tr>
<td></td>
<td>1966, and Rieley, 1968) extinction (Bucher</td>
</tr>
<tr>
<td></td>
<td>and Lovaas, 1968, and Lovaas and Simmons,</td>
</tr>
<tr>
<td></td>
<td>1969) timeout (hands-on) (Solnick, Rincover,</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Self-destructive behaviors</strong></td>
<td></td>
</tr>
<tr>
<td>biting</td>
<td></td>
</tr>
<tr>
<td>head banging</td>
<td></td>
</tr>
<tr>
<td>beating themselves</td>
<td></td>
</tr>
<tr>
<td>arm banging</td>
<td></td>
</tr>
</tbody>
</table>
Language Disorder

mute

mute (after the age of 5)

immediate echolalia

language (non-functional)

language

and Peterson, 1977)
overcorrection (Harris
and Romanczyk, 1976)
water mist (Dorsey
et al., 1980, Harris,
1983)

Treatment Centers
overcorrection (TEACCH,
Judevine, and Dever-
eux) shock (Judevine)

Behavioral/Educational

verbal imitation
(Lovaas et al., 1966)
shaping process
(Lovaas et al., 1973)
operant condition
(Hewitt, 1965) prompt-
ing and fading
(Marshall and Hergrenes,
1970)

sign language (Carr
et al., 1978 and Miller
and Miller, 1973)

shaping procedure to
teach correct response
(Carr, Schriebman, and
Lovaas, 1975, Lovaas
et al., 1973)

operant conditioning
and communication
therapy (Halper, 1970)

simple and compound
sentence usage (Stevens-
Long and Raamussen, 1974)
REFERENCE NOTES


Harris, G. Personal Communication (Telephone Interview). Rutgers University, May 16, 1983.


References


Browning, R. Treatment effects of a total behavior modification program with five autistic children. Behavior Research and Therapy, 1971, 9, 319-327.


Campbell, M., Friedman, E., Green, W., Collins, P., Small, A. and Breuer, H. Blood serotonin in schizophrenic


Fineman, K.R., and Ferjo, J. Establishing and increasing ver-

Fish, B. Involvement of the central nervous system in infants with schizophrenia. * Archives of Neurology, 1960, 2*, 116-121.


Harley, H.G., Stahl, S.M. and Freedman, D.X. Hypersero-
tonemia and amine metabolites in autistic and re-

Harris, S. and Wolchik, S. Suppression of self-stimulation:
Three alternative strategies. Journal of Applied Be-
havior Analysis, 1979, 12, 185-198.

Harris, S. and Romanczyk, R. Treating self-injurious be-
havior of a retarded child by overcorrection. Behavior
Therapy, 1976, 7, 235-239.

Heeley, A.F., and Roberts, G.E. A study of tryptophan meta-
bolism in psychotic children. Developmental Medicine
and Child Neurology, 1966, 8, 700-718.

Hermelin, B. & O'Connor, N. Psychological experiments with
1970.

Hermelin, B. and O'Connor, N. Measures of the occipital
alpha rhythm in normal, subnormal and autistic children.

Hewett, F.M. Teaching speech to an autistic child through
operant conditioning. American Journal of Orthopsychia-

Himwich, H., Jenkins, R., Fujimori, M. and Narasimachari, N.
A biochemical study of early infantile autism. Journal

Hingtgen, J.N., and Bryson, C.Q. Recent developments in the
study of early childhood psychoses: Infantile autism,


Lovaas, O., Koegel, R., Simmons, J. and Long, J. Some generalization and follow-up measures on autistic children in behavior therapy. *Journal of Applied Behavior Analy-

Mittle, V. and Miller, E. Conflict-developmental training
1973, 27, 24-29.

ren, The American Journal of Occupational Therapy,
Maagaret, C. N. Hand-gesturing behavior in psychotic child-

therapy for autistic mentally retarded children. Journal
Marshall, N. R. and Herren, J. R. Programmed communica
tion. 20, 111-121.


Makla, K., The age of onset of childhood schizophren
er Research and Therapy, 1971, 9, 305-310.

of autistic children in a two-stimulant situation. Be-

Loaves, O. I., and Schiffman, L., Stimulus overselectivity

observation on the neurophysiopathology of chil-

Loaves, O. I., Warren, J. W., Kogel, R. L., and Lorcan, N. Some

Pedaled behavior analysis. 1969, 2, 143-159.

struction in three retarded children. Journal of Ap-

Loaves, O. I., and Simmons, J. G., Manipulation of self-
des


book of behavior modification and therapy. Englewood

psychotic children. In H. Retterbery (Ed.), Hand-

Loaves, O. I., and Neuman, C. D., Behavior modification with

197, 1973, 6, 131-166.


critical review. American Journal of Psychiatry,
1976, 133, 609-621.
Ornitz, E.M., Ritvo, E.R., and Walter, R.D. Dreaming sleep
in Autistic and Schizophrenic children. American
Ornitz, E.M., Ritvo, E.R., and Walter, R.D. Dreaming sleep
in autistic twins. Archives of General Psychiatry,
1965, 12, 77-79.
Piaget, J. The construction of reality in the child. New
Pitfield, M. and Oppenheim, A.N. Child rearing attitudes of
mothers of psychotic children. Journal of Child Psy-
chology and Psychiatry and Allied Disciplines, 1964,
5, 51.
Prior, M.R. Cognitive abilities and disabilities in infant-
tile autism: A review. Journal of Abnormal Child
Psychology, 1979, 7, 357-380.
Rank, B. Adaptation of the psychoanalytic technique for
the treatment of young children with a typical develop-
ment. American Journal of Orthopsychiatry, 1949, 19,
130-139.
Rimland, B. Infantile Autism, Appleton-Century-Crafts,
Rincover, A. Sensory extinction: A procedure for elimina-
ting self-stimulatory behavior in developmentally
disabled children. Journal of Abnormal Child Psycho-


Archives of General Psychiatry, 1968, 18, 439-449.


Tubbs, V.K. Types of linguistic disability in psychotic children. Journal of Mental Deficiency Research, 1966,


