Use of behavior modification principles in the treatment of autistic children

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THE USE OF BEHAVIOR MODIFICATION PRINCIPLES IN
THE TREATMENT OF AUTISTIC CHILDREN

by

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CHAPTER I

INTRODUCTION

During the past decade educators have become increasingly concerned with the plight of the autistic child. This child lives an introspective life and one out of 50,000 or 100,000 children are affected. The characteristics of the autistic child are presented in the following description:

The autistic child lives apart from others. He cannot reach out and no one can reach in. A good part of the time the child does nothing but sit quietly in the chair, or sleep, or lie huddled in a corner. At other times he is quite active, sometimes violently so, but his activity affects only himself. He may spend hours compulsively rubbing a rough spot on the floor, moving his fingers in front of his face, babbling to himself, licking his body like a cat, or flipping sand to produce a visual pattern. He may beat his head against the wall, hit himself until he is covered with bruises, or use his fingernails and teeth to tear his own flesh.

Some autistic children are mute. Others make inarticulate sounds or echo bits of speech they hear around them. But they do not talk to or with other people. When an autistic child does try to communicate it is by hitting, kicking, screaming, having tantrums -

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Primitives forms of behavior, called atavisms, which create a situation others will go to almost any lengths to eliminate.\(^2\)

The cause of autism is unknown. Histories of these children indicate that the disorder may be the result of a severe trauma during infancy. Parents who are completely unresponsive or who have beaten, tortured or mistreated their children may be partly responsible. Also, parents who have not mistreated their children but who, when they find out their child is autistic, may not provide him with the same opportunities as they do for their normal children must share the blame. In many instances autistic behavior appears to be the result of multivariate factors. Hopefully, medical science will play an important role in the identification and prevention of this disorder in the future.

**General Overview of the Problem**

Regardless of the origin of autism, the main question to be answered is: "What can be done to help the autistic child?" A review of significant literature concerning this question revealed that many educators believed behavior modification techniques to be one hopeful method. This technique does not require that children have language skills - it has been used effectively with mute.

Behavior modification is not new - teachers have been using this technique for years. The student who received

\(^2\)Ibid.
a 100 percent on a spelling test received a star on his paper to encourage this type of behavior, and the student who misbehaved during class was kept after school to prevent this type of behavior from reoccurring in the future.

The principle behind this approach is that even the unusual behaviors of the autistic child are learned. Therefore, by training him to respond to cues and providing him with rewards or punishment he can learn more normal responses regardless of the severity of his inappropriate behavior. Using this method, the practitioner who wants to identify a problem observes the child's behavior - he does not preoccupy himself with labels or I.Q. scores. The behavior of the child is the key to his treatment.

Basic to the application of behavior techniques is the principle of reinforcement. Results of the child's actions are either rewarded or punished. Positive reinforcers which encourage a certain behavior might include: money, attention, food, or something he likes. Negative reinforcers such as separating the child from the group are used to discourage autistic behavior. Sometimes two reinforcers are used at the same time such as candy and praise. The environment can also be used for reinforcement. For example, in teaching a child to put on his shirt, help from the parent is based on the child performing more and more of the procedure himself. Thus, the environment becomes the reinforcer rather than candy.
In the use of reinforcement it is important that the reinforcer be given immediately after the response. It is also important to establish specific objectives before becoming concerned with the type of reinforcement to be used.

When dealing with autistic children, the child's behavior may not be the only behavior that needs changed. In some instances the parents and teachers have received training in the appropriate ways to react to the child's behavior.

The treatment of autistic children is difficult and time consuming. Although behavior modification is not a panacea, it has been used with some success in the education of some of these children and it has contributed to an optimistic attitude toward educational procedures for the child. Most important, it employs learning principles which may be understood and used by both parents and teachers.

**Definition of Terms**

A scientific definition of behavior modification as it is used and understood by educators today is offered by James Kauffman:

*Behavior modification is a methodology which involves continuous or frequent observation and recording of directly observable behavior in what is termed functional analysis. The behavioral record is continued through several phases, including a phase in which the rate of*
specified behavior is determined, a phase in which a procedure to modify the behavior is instituted and a phase in which the modification procedure is discontinued. The functional analysis of behavioral change takes into consideration antecedent or stimulus events. The movement or specified behavior which is to be changed, subsequent or consequent events, and the arrangement or contingency system which defines the relationship between the occurrence of behavior and its consequence. In some variants of operant methodology, measures other than rate of behavior, e.g. percent, are employed but the objective is still to demonstrate the relationship between a behavior and an antecedent event.3

Other terms which are frequently encountered in the literature concerning behavior modification were presented in Luke S. Walton's book entitled Child Behavior Modification - A Manual For Teachers, Nurses and Parents. Included were:

Operant Conditioning - conditioning or training that is limited primarily to changing voluntary behavior in people, such as walking, talking, and doing things with the hands as opposed to reflexive behaviors such as eye blink, salvation and digestion.

Time-out Procedure - withdrawal of potential consequences.

Unconditioned Reinforcement - unlearned - the child likes it the first time he sees it.

Conditioned Reinforcement - learned - can be exchanged for something the child values.

Extinction - ignoring the child when he does something we don't want him to do.

Stimulus Control - the fact that certain cues or stimuli in the environment actually control our behavior.⁴

In Analysis and Modification of Classroom Behavior Norris Haring and E. Lakin Phillips presented still other useful definitions:

Baseline - the initial measurement of behavior under a stable set of conditions.

Response Rate - the number of responses per unit of time that the child makes under specified conditions.

Contingent - relationship between what the child does and what happens afterward.⁵

The preceding presentation of definitions will hopefully increase the reader's understanding of the literature reviewed in this paper concerning the use of behavior modification strategies in the treatment of autistic children.

Limitations of This Study

The twentieth century was the beginning of the scientific application of behavior modification principles to elicit certain responses.

Pavlov's (1927) experiment in conditioning a response is famous. Making use of the observation that dogs salivate at the scent of food, Pavlov first presented


a dog with meat powder to produce the response of salivation and then paired the presentation of the meat powder with the ringing of a bell. This also elicited a salivation response. After a number of trials, the meat powder was withdrawn and the bell-ringing only was presented. The dog still continued to respond by salivating. This experiment successfully demonstrated that a response can be conditioned by a stimulus.6

As early as 1949, Paul Fuller reported an experiment in which behavior modification was applied in the treatment of an 18 year old subject whose behavior was described as that of a "vegetative idiot." Attempts were made to positively reinforce the subject by injecting a solution of sugar-milk in his mouth whenever he moved his right arm. By the end of the conditioning period, the subject had made definite and discrete responses (he would lift his arm and open his mouth immediately).7

It was felt at that time by those who participated in the experiment that other responses could be conditioned and discriminations learned. In fact, Fuller stated: "Perhaps by beginning at the bottom of the human scale, the transfer from rat to man can be effected."8

6Ibid., p. 23.


8Ibid., p. 590.
Experiments such as this have contributed greatly to the research, and an effort has been made in this paper to focus on all significant literature relating to the treatment of autistic children by means of behavior modification since Fuller's report of 1949. The majority of research reports presented occurred in the last decade.

**Purpose of This Paper**

Chapter I was an attempt to present the reader with the characteristics of the autistic child, an overview of the problems this child encounters, and the use of behavior modification as a possible method of treatment. Definitions of various terms employed by behavior modification practitioners were provided. The limitations of this study and the purpose of this paper were also provided.

Chapter II was concerned with a review of significant literature in the area of behavior modification as a possible solution to the problems facing the autistic child. A review of this material revealed that experimenters have focused mainly on the following autistic behaviors: self-mutilative, language, and compliance and resistance (what the child can do as opposed to what he will do).

Chapter III concentrated on a summary of the literature reviewed and conclusions which might be drawn concerning the changes which are needed to increase the effectiveness of the behavior modification approach in the rehabilitation of autistic children.
CHAPTER II

REVIEW OF LITERATURE

Before presenting specific research relating to the treatment of autistic children by means of behavior modification principles, it was felt that a brief consideration should be given to other approaches which have been attempted with these children.

In Bert Kruger Smith's book, *No Language But A Cry*, the author makes this statement:

"Autistic children need, they want, they fear, they love, they hate and die just like all of us. The difference is a matter of degree, of how they defend themselves against their terrors and their wants. We withdraw a little when we are hurt, and cry a bit. They withdraw all the way and build a shell around themselves so that the awful hurt can never happen again."\(^9\)

The result of "turning off a world that seems to painful"\(^10\) has, in some instances, caused these children to be diagnosed as deaf and fitted with hearing aides. In other instances, they have become the sole concern of speech therapists.\(^11\)


\(^10\)Ibid.

\(^11\)Ibid.
Until recently the predominant approach to their understanding and treatment has been the medical model which included psychodynamic and biogenetic schools. The medical model assumes two things: First, it is assumed that the cause of the child's disorder is internal. Second, therapy should be derived from and consistent with causation. However, when the presenting symptoms are deviant behavior as in the case of autism, the practitioner of the medical model is unable to locate the internal "illness" independent of its symptoms.\textsuperscript{12}

In sharp contrast to the medical model is the behavior model. For practitioners of this model, the locus of the child's problem is external - the child's disordered behavior is his problem rather than internal conflicts and his behavior is a direct consequence of external stimulus events. Thus treatment is a process of education. For whatever ultimate reasons the autistic child did not learn to play, speak or cooperate, the fact remains that he does not know how to play, speak and cooperate now. Treatment is designed to teach the child the behavior patterns necessary for his participation in the natural community.\textsuperscript{13}


\textsuperscript{13}Ibid.
As mentioned earlier, the autistic behaviors which have been the primary concern of the behavior model practitioners include: self-mutilative, language and compliance and resistance behaviors. At this point, attention will be turned to research concerning these behaviors - the experimenters, the subjects, the methods and the results.

**Self-Injurious Behavior**

Some autistic children frequently produce injury to their own bodies. Therefore, before it is possible to work on such skills as language, this self-destructive behavior must be under control. Extinction, time-out, the establishment of incompatible behaviors and shock treatments have been some of the techniques attempted to effect this control.

**Extinction**

Extinction procedures were used by Bucher and Lovaas in 1968 with a 7 year old boy diagnosed as retarded who hit his head against the crib and beat his head with his fists. The extinction situation consisted of leaving the child in his bed with no attention given to his destructive actions. As a result, the rate of these actions gradually fell off by the tenth session but he had hit himself over 10,000 times. Also, although this procedure appeared effective in the experimental situation, his self-destructive behavior in other situations was not affected.¹⁴

Lovaas and Simmons attempted extinction techniques in 1969 with an 11 year old retarded autistic boy. The child was ignored when performing self-destructive acts and the acts fell from a high of 900 during the first session to a low of 30 during the last extinction.15

Time-Out

Time-out procedures were employed by Wolf, Risley and Mees in 1964 when they conducted an experiment with a 3½ year old boy who was constantly displaying tantrum behavior and slapping himself. The prescribed procedure included mild punishment (time-out) by the attendants and the parents of the child while in the hospital ward. As a consequence, the severity of the tantrums gradually decreased and self-destructive behavior remained at zero six months after the child left the hospital.16

A second experiment involving the same child was reported by the authors in 1967. The child had returned to temper tantrums and slapping himself. Time-out strategies this time consisted of taking the child to another room contingent upon temper tantrum and self-slapping behavior. From class session 23 to class session 43 there were only three occurrences of self-slapping and


no occurrences from session 43 to 107.  

In 1966, Tate and Baroff used time-out in the treatment of a 9 year old psychotic boy who slapped his face, punched his head, banged his head against hard objects and kicked himself. This time the procedures involved contingent withdrawal from human physical contact (holding the child's hand). The contact was reinstated after brief intervals during which no self-injurious responses occurred. (Earlier observations had indicated that physical contact was reinforcing to the child.) Reported results revealed a sharp decline of self-injurious responses during the experimental sessions and the child began attending more to environmental stimuli on subsequent days. Also, he stopped crying and whimpering. Both authors felt that time-out procedures had been effective.  

One year later Hamilton, Stephens and Allen also used time-out in the control of aggressive and destructive behavior in two severely retarded institutionalized residents. The first subject was a 17 year old girl who banged her head and back against the wall (350-700 times per week of head banging and 500-900 times of back banging).  


Time-out methods consisted of placing her in another room for 30 minutes when she displayed unacceptable behavior. The frequency of occurrence of the banging behavior for 5 successive weeks was reduced to: 7, 2, 0, 1, 0 remaining at zero after 9 months.19

The second subject, a 16 year old girl who frequently broke windows with her head, was restrained to bed for two-hour periods immediately after breaking the window. The frequency in occurrence for 7 successive weeks was reduced to: 6, 1, 3, 3, 1, 1, 0 remaining at zero 11 months later. The authors again concluded that in both cases the procedure proved to be effective and rapid in total elimination of specified behaviors and the subjects were more socially outgoing, happier and better adjusted in the ward setting.20

Reinforcement of Incompatible Behaviors

In addition to extinction and time-out procedures, some experimenters have attempted to change autistic behavior by the reinforcement of incompatible behaviors.

In 1965, Lovaas and others reported two studies employing this method. The subject was a 7 year old schizophrenic child. The first study consisted of the following phases:


20Ibid.
1. Phase I - Acquisition - reinforcing appropriate music behavior with social approval.

2. Phase II - Extinction - withholding social approval for destructive behavior and the experimenter was just friendly during the sessions.

3. Phases III and IV - Replications of Phases I and II.\(^2^1\)

Appropriate music behavior and self-destructive behavior were recorded starting with the first extinction. During the first extinction, self-destructive behavior increased. During the second acquisition, the self-destructive behavior decreased to a near zero level while during the second extinction, there was a rapid increase. The authors believed that the occurrence and magnitude of self-destructive behavior was a function of the reinforcement and subsequent extinction of another behavior in the same extinction.\(^2^2\)

The second study by these authors involved the acquisition of another response by the same subject in a different experimental setting. This time the method included social approval and attention contingent upon the occurrence of a bar-press response. Once a steady rate of bar-pressing was acquired, extinction began and the experimenter remained inattentive throughout the sessions. Findings indicated an immediate increase in self-destructive behavior during the extinction of the bar press response and a subsequent decrease upon the


\(^{2^2}\)Ibid.
reintroduction and reinforcement for bar pressing.
(Both studies noted that the occurrence of self-destructive behavior in the experimental room was related to its occurrence in other settings.)

One year later Allen and Harris reported a study using this method on a 5 year old girl whose body was covered with open sores and scabs from scratching herself. The procedure again included a combination of extinction and reinforcement. The child's mother was trained to withhold reinforcement contingent upon the child's scratching (she was to ignore the child when scratching but reinforce desirable behaviors). Weekly sessions were held and the mother was given approval for any progress made. By the end of six weeks, the child's skin was practically clear and a gradual reduction of extrinsic reinforcement was started. The sessions with the authors ended and recommendations were made to the mother based on observation records kept by the mother and also by her behavior in response to the child prior to treatment.

Two years after this experiment, Petersen and Petersen reported a study involving an 8 year old boy

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23 Ibid.

who displayed violent self-injurious responses (slapping the side of his head, hitting his hand against his teeth and banging his forehead against his forearms). Modification techniques involved:

1. A baseline period - observations were recorded on the hospital ward and in the experimental room.

2. First experimental period - food reinforcement and the word "good" were given contingent upon a 3 to 5 second interval of no self-injurious responses. If self-injurious responses occurred, the experimenter took the food and turned away from the child.

3. Second experimental period - reinforcement was given following a brief interval of no self-destructive behavior. When a self-destructive behavior occurred, the child was told to walk across the room and sit in a chair. If no self-destructive behavior occurred while walking to the chair, the child was reinforced.

4. Reversal period - the child was told to walk from one end of a room to the other until a self-injurious response occurred, at which point he was reinforced.

5. Third experimental period - reinforcement was identical to the second experimental period.

Results were as follows:

1. First experimental period - a drop in the rate of self-injurious behavior occurred although there was considerable variability in the rate of responses per minute.

2. Second experimental period - there was considerable variability in the rate of self-injurious behavior initially, but the response ultimately disappeared and stayed at zero level.

3. Reversal period - response rate rose to a high level almost immediately.

4. Third experimental period - the response rate dropped and remained at near zero level thereafter.

5. While the child was on the ward, subsequent attendants reported fewer self-destructive behaviors. 25

In conclusion, the authors pointed out that they were not clear on how much the walking procedure contributed to the reduction of self-destructive behavior. They felt it was possible that it functioned as a punishing stimulus which delayed reinforcement or as a mediator of the minimal period between self-destructive behavior needed for reinforcement to occur.\textsuperscript{26}

Another experiment was reported by Brawley and others in 1969 involving the use of this method once again in attempting to modify the behavior of a 7 year old boy diagnosed as autistic who slapped himself forcefully about the face and head. Social reinforcement consisted of giving the child food contingent upon all desirable behavior and withholding all reinforcement for 15 seconds following inappropriate responses. Behaviors were chosen for strengthening such as: appropriate verbalizations, appropriate use of materials and the following of requests and commands. Self-hitting behavior was chosen to be weakened. Four phases of the study included: (1) a baseline period, (2) a reinforcement period, (3) a reversal period, and (4) a second reinforcement period.\textsuperscript{27}

During the first reinforcement periods, the intensity of self-hitting decreased. Tantrums occurred only once during the reinforcement periods and did not reappear during treatment sessions. In addition, data obtained

\textsuperscript{26}Ibid., p. 360.

in the three month period following the study showed that all inappropriate behavior had stayed at a very low level. It was felt, by the authors, that reinforcement of incompatible behaviors can be effective when used in conjunction with other procedures. However, a question remained as to what particular techniques are most effective.²⁸

Shock Treatment

Sometimes the severity of self-destructive behavior has been considered great enough to warrant the use of electric shock in its treatment. Therefore, several experimenters have undertaken attempts to determine the value of this method.

In 1966, Tate and Baroff attempted a second study on the 9 year old boy mentioned earlier in this paper whose self-injurious behavior was reduced by responses contingent upon withdrawal of physical contact (time-out). Although the self-injurious behavior was reduced, the risk of eye damage to his right retina from further head banging was thought great enough to apply the use of shock as a negative reinforcement. The procedure included allowing the subject a period of 24 minutes of free response prior to the administration of shock. During this time, his behavior was observed and recorded and during all shock periods, when the authors were present, all noninjurious behaviors were praised. At other times, the child was

²⁸Ibid.
left alone unrestrained and was observed on closed circuit television. Contingent shock was presented with a delay of 30-35 seconds between the occurrence of response and administration of punishment. Results indicated a decrease in self-injurious responses (at the time of the report, 167 days had elapsed since the beginning of shock and the last observed self-injurious response was emitted on day 147). Also, the subject was beginning to engage in other activities.29

Shock treatment was again used in 1968 by Bucher and Lovaas. Three different subjects were involved. The first was a 7 year old boy who was given a total of 12 shock treatments over 4 sessions. Self-destructive behavior occurred for the next few weeks and then gradually decreased to zero. As the destructive behavior decreased, the child began to attend to adults and cried less. Freedom from these restraints permitted other reinforcing activities. Unfortunately, the effect of shock did not generalize to a room away from the experimental room. Efforts were therefore made to administer the shock in another setting and this time only two treatments were necessary to bring the behavior down to zero and retain

29B. G. Tate and George S. Baroff, "Aversive Control of Self-Injurious Behavior In A Psychotic Boy," Behavior Research and Therapy (May 1966): 284-287
it there until the end of the experiment (18 days).  

The second subject, a 7½ year old girl, frequently beat her ears and hands. Fifteen shocks were administered in 4 sessions. The word "No" was paired with shock in each session and was used without shock in 2 sessions. Results were:

1. Self-destructive behavior dropped to zero and remained there until the end of the study.

2. There was a decrease in whimpering, fussing and avoiding adults.

3. The child had discriminated between punishing and nonpunishing behavior.

4. The word "No" acquired suppressing properties.

A 16 year old retarded girl who would bite her hands severely, remove her nails by the roots with her teeth and bang her head was the third subject. Whenever the child was praised or comforted, she would mutilate herself. It was therefore decided that shock might prove beneficial. Five shock treatments brought the head banging to zero; however, her aggression toward other children in the ward was increasing. It was hypothesized by the authors that this occurred since she did not develop a more acceptable behavior and was not trained to behave otherwise.

During the same year, Bisley performed an experiment to reduce highly dangerous climbing behavior of a 6 year

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31Ibid., p. 302.

32Ibid., pp. 303-305.
old girl diagnosed as having brain damage, emotional disturbance and autism. Modification procedures began with instructing the mother to make physical isolation (time-out) contingent upon climbing behavior. The child was put in a room for 10 minutes each time this behavior was displayed. After 17 days there was no reduction in the rate of climbing. The setting was then changed from the home to the laboratory and the child was ignored for climbing and given milk when she looked at the experimenter. Again there was no reduction in the frequency or duration of climbing behavior. Finally, it was decided to use shock and five shocks were administered over five sessions. "No" was shouted before presenting the shock. This time the results were positive - there was no further climbing in the following 12 sessions.\(^{33}\)

However, the mother reported no decrease in climbing at home. The experimenters then placed the child in a room alone five minutes before the sessions began. The child climbed but not during the regular session when the experimenter was present even if the shock apparatus was absent. After 10 sessions in which there was no climbing with the presence of the experimenter, new furniture was brought into the room - climbing occurred but was not shocked. Ten sessions later the climbing was

shocked once and no climbing occurred for the next 59 sessions.\(^{34}\)

The final step involved punishment at home by the mother - she was instructed to spank the child for climbing. During the next 25 days there was a slight increase in climbing but a new procedure was tried and the child was taught to sit in a chair by shocking when she didn't comply. This shock treatment did maintain climbing at a low level at home and the mother was able to devote time to training appropriate behavior.\(^{35}\)

In 1970, shock was employed by Yeakel in the treatment of a 14 year old girl with a severe problem of head banging which resulted in severe bruising edema. Before an episode of the mumps, the head banging was effectively controlled with drugs. After the illness, the medicine had little effect and an autoinduced electrical stimulus was used. It was worn like a hat and delivered an adverse shock to the arm of the girl whenever the head was struck. This resulted in the child making a rapid association between the act of striking her head and the adverse stimulus received by her arm. However, when the electrodes were removed from her arm before being removed from her head, she began hitting her head vigorously. Furthermore, there was no sound conclusion because of limited evaluation techniques presented

\(^{34}\) Ibid.

\(^{35}\) Ibid.
so that others working with similarly involved patients might have the opportunity to evaluate the appliance which seems to have very positive effects in modifying an unwanted behavior. 

More recently (1973), Hall and others reported efforts to determine the effectiveness of aversive stimulation to effectively reduce self-mutilative behavior (head banging) in an 11 year old boy. Treatment consisted of four phases:

1. Phase I - a shock stick was used as a means of aversion by the psychologist while the child was on drugs.

2. Phase II - a shock stick was used by the psychologist while the child was not on drugs.

3. Phase III - a shock stick was used by the two attendants rather than the psychologist.

4. Phase IV - a shock stick was used by two attendants who pretended to leave but watched behavior and when the child would self-mutilate, they would reappear and administer shock stick stimulation.

Results were as follows:

1. The authors felt that almost any ongoing self-destructive behavior could be effectively suppressed whenever treatment personnel appeared carrying the shock sticks.

2. 150 days after treatment termination, systematic observations were made and the subject was observed exhibiting "mild" self-mutilative behaviors on the average of .001 times per minute which was fewer than during the pre-treatment observations.

3. The staff described the child's behavior as less dangerous to himself and he became more involved in activities and his physical health improved.

4. The subject had become more incontinent during waking hours.  

Language Behavior

Only half of all autistic children use speech and the child who fails to do so before age five is the one who makes the worst social adjustment. Therefore, speech recovery is of extreme importance for some autistic children. The theoretical foundations underlying verbal conditioning and the stages and trends in conditioning were provided by Hartung:

Theoretical foundations should include:

1. Normal children acquire words by hearing speech. The first step is to establish conditions in which imitation of vocal sounds will be learned.

2. Autistic children typically do not imitate which may be due to a limited self-non-self differentiation. They may profit from emphasis on boundaries and limits of their own bodies.

Stages and trends in conditioning include:

1. The training environment - a room with limited possibilities of disturbance.

2. Limitation of disruptive behavior by physical restraint, spanking and time-out from positive reinforcement.

3. Conditioning attention and eye contact by holding reinforcers in front of the child's face.

4. Transition from motor to verbal imitative behavior - condition motor behaviors before vocal training.

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5. Systematic selection of vocal responses - manually moving the child through sound.

6. Establishing control over vocal responses - the child is rewarded for all vocalizations.

7. Sudden emergence of echolalia - the resistance to learn a second word and then immediate imitation of any new word.

8. Phenomenon of silent speech - soon after echolalia some children demonstrate a silent vocabulary.

9. Transition from imitation to naming - the child is reinforced for naming an object.

10. Establishment of phrases - mimicking of phrases is reinforced and control is shifted to appropriate circumstance by introducing partial promptings which are gradually faded out and more varied sentences are taught.

11. Generalization of appropriate speech - reinforce appropriate speech, training the child to respond to a variety of individual, select words that have relevance to the child.

12. Imitation as a precursor or identification - deep analysis of imitative behavior reveals that imitation may be the precursor of some other behavior attribute.39

Although the majority of research efforts reviewed for this paper were concerned with the modification of self-destructive behaviors, some studies have been concerned with the development of the autistic child's language skills.

In 1964, Hewett attempted to teach reading skills to a 13 year old autistic boy. The boy's interest in jigsaw puzzles and letters served as a clue to the educational program. The first step was to teach the child that real objects could be represented by pictures and word symbols

39Ibid., pp. 203-217.
(a word board was constructed). The child was reinforced (candy gumdrops served as a suitable motivator) for associating a picture card with a concrete object. Positive reinforcement was used again when the child associated a picture and a word symbol. Puzzles were made to assist in word-picture association. As a result, the child acquired rudimentary reading (55 word-sight vocabulary) and his increased interest in the environment made him more accessible to social control.⁴⁰

Four years later, Stark and others attempted to increase the verbal behavior in a 5 year old autistic child. The subject was seen by the authors 4 days a week for 1½ hour periods. The procedure involved positive reinforcement (patting the head and knees) for non-verbal imitation (movement of the tongue, lips and jaw), vocal imitation, and verbal labeling. Verbal discrimination abilities were also reinforced with candy.⁴¹

The present status of the child is that he can:

1. Reproduce new words with four phonemes.
2. Copy letters and figures.
3. No longer needs candy as a reward and could be taught with the traditional methods employed for deaf and aphasic children.⁴²

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⁴² Ibid., pp. 44-48.
Again in 1969, Miller presented a study involving language therapy for a 9 year old autistic boy. The first step in the procedure involved supervision in play to facilitate ego development. The ability to recognize words was then attempted by visual stimulus followed by printing words. A therapist worked in the area of written language development by means of consistent demands believed to be within the child's academic learning potential. Combined visual and auditory stimuli were repeated until he reacted to auditory stimuli alone. Negative reinforcement (physical force) was used to prevent tantrums and verbal praise accompanied successful performance. The author concluded from this experiment that:

1. Language took the form of rote learning.

2. No spontaneous meaningful speech resulted from the child's mastery of letters or words.

3. Language training did enhance the child's control and frustration.

4. Some communication developed - grunts which indicated the possibility that minimal language development might occur.

In 1970, Marshall and Hegrenes presented a report which involved programmed communication therapy for autistic mentally retarded children. The authors believed that behavior modification would facilitate stimulus control and simplicity of response. The subjects included: a 13 year

old boy; a 6 year old boy; boy; a 14 year old boy; and a 7 year old boy. A team consisting of one clinician, one or more behavior analysts, observers, recorders and parents held sessions twice daily. Before treatment, baseline behaviors were recorded in 15 second time intervals for 30 minutes (high and low probability behaviors were identified). During treatment sessions, schedules of reinforcement were noted on data retrieval sheets (data was recorded on a graph). Video recordings were made periodically. Gestural models were used to develop looking and imitative skills and object identifications and descriptions were used for concept formation. The environment was arranged to prevent inappropriate behavior and, in some cases, physical restraint was necessary. Primary reinforcers were consistently paired with social reinforcers. Auditory cues were stressed and reinforcement was not given if the children did not respond to visual cues. An evaluation of the results indicated:

1. The 13 year old boy - concept formation was developed by pairing a verbal discriminative stimulus with the object representation.

2. The 6 year old boy - development of sufficient communication skills to enter a special education classroom.

3. The 14 year old boy - responses were increased to ten word sentences and therapy was terminated after 23 half-hour sessions.

4. The seven year old boy - after 10 hours of therapy, echolalic and interfering verbal responses were extinguished and the child was able to enter a special education class.14

Last year Dmitriev and Hawkins reported still another experiment attempting to increase the language behavior of a 9 year old mute girl. The child had been placed in a remedial class after she began exhibiting a variety of maladaptive behaviors including the inability to talk. Strategies this time included withdrawal of attention by her teacher when she refused to talk. After four days, she made no response. On Day 5 the child spoke 7 words and by the end of 6 months she was talking freely to the teacher, a consultant and the staff - she was ready for the public schools.45

Compliance and Resistance Behavior

The material reviewed for this paper revealed that several efforts were attempted to change the behaviors of autistic children. Little consideration; however, had been given to the possibility that these children may know what to do but refuse to do it. For this reason, a consideration of two experiments conducted in an effort to gain insight into compliance and resistance behavior of autistic children appeared to be worthwhile.

In 1965, compliance and resistance behavior was the focus of a study by Philip A. Corvan and others. In this study, 12 autistic children between the ages of 4 and 9 were chosen as subjects. They were asked to choose red objects and square objects from a stimulus array. Sixty

conditioning trials were given in which the choice of objects was reinforced. During these trials some of the children demonstrated an increased tendency to comply with the experimenter's instructions. Others were aware of the demand but resented compliance. The examiners felt that the results suggested:

1. More attention should be paid to the distinction between responses that autistic children are unable to make and responses they are unwilling to make.

2. Failure to respond might be interpreted as: lack of capacity; lack of experience; lack of general motivation or drive; or resistance or negativism (high negativism might be based on the fact that the child could recently perform some act but does not do so in the present.)

In 1969, Brown and others reported a total treatment program for a 6 year old autistic boy which was primarily concerned with negativism. An exploratory session was held to obtain direct impressions and four categories of behavior were recorded: relevant responses, tantrums, verbal negativism and passive negativism. It was decided that negative behavior might be changed by teaching the child to read. The Science Research Associated Reading Series was used to start the child talking through oral reading. Individual sessions were divided into:

1. Baseline period - recordings were made of the child's reactions to demands.

2. Second period - a period in which demands were enforced in a calm manner.

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3. Third period - a period in which a reinforcement system was introduced.

4. Fourth period - a period in which reinforcements were used but the reinforcement schedule was changed and praise was gradually introduced.

Results were:

1. Baseline period - negativism resulted.
2. Second period - child was reading.
3. Third period - relevant speech increased.
4. Fourth period - there was no bizarre talk and no negativism.

In addition, the authors believed that less dominant but more appropriate approaches to autistic children should be strengthened.\(^{47}\)


\(^{48}\) Ibid., p. 122.
CHAPTER III

SUMMARY

In this study an attempt was made to determine the effectiveness of the use of behavior modification principles in the treatment of autism. Significant literature relating to self-destructive behavior, language behavior and compliance and resistance behavior of the autistic child was reviewed. Attention will now be focused on a summary of this research.

According to Kozloff, "behavior modification has had remarkable success in rehabilitating autistic children and training their parents." In general, behavior modification techniques were found suitable for several reasons:

1. They motivated the apathetic or negativistic child to learn.

2. They provided techniques for eliminating undesirable behaviors such as head slapping and temper tantrums.

3. They did not require that children have language skills.

4. They did not require a minimal educational or experimental repertoire - they could be used even with the profoundly autistic child.

5. They vastly simplified the educational process by means of the shaping procedure.

6. Training progressed at the child's own pace. More specifically, modification techniques such as: extinction, time-out, reinforcement of incompatible behaviors and shock have been used effectively in treating these children. They have frequently reduced self-destructive behavior to zero or a very low level making it possible for the child to make contact with potentially reinforcing aspects of the environment that automatically reinforce beneficial modes of behavior. Also, they allow more positively directed programs to be achieved.

However, behavior modification has not solved all of the problems. In 1969, Dennis Howell, Under Secretary in England's House of Commons stated:

Autistic children have often been neglected, they have been described as ineducable and there has been little provision for their employment.

Behavior modification is based on the principles of operant conditioning. However, operant conditioning explanations of the etiology of autism are unverified - it is not logical to argue that because a child can be taught to speak through reinforcement, his mutism must have been the result of an absence of such reinforcement

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in the child (the researcher was simply not present). 53

Another criticism of behavior modification is that in most programs parents are trained to handle isolated behavior problems rather than a large portion of the autism syndrome. 54

Behavior modification has been applauded and criticized. In the future, behavior practitioners should strive for a more systematic and standard way of analyzing the patterns of interaction in the home, training parents as teachers and restructuring the patterns of exchange in the home so as to promote the child's rehabilitation. 55

In addition, programs dealing with autistic children should initiate a "school time" which has two major goals: (1) to develop academic behavior in autistic children, and (2) demonstrate, in local school systems, that even the most severely disturbed children are amenable to academic approaches. 56

The initiatives which have been taken since Fuller's conditioning experiment in 1949 are beginning to pay off. We know that regardless of the origin of the damage to the child, he can benefit from education particularly if it is designed specifically for his needs. Hopefully, at some future date, an increased knowledge of behavioral disorders may provide the key for complete rehabilitation of the autistic child.

54 Ibid.
55 Ibid.
56 Ibid.
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