

THE CONTROL OF VIOLENT BEHAVIOR
OF A CHRONIC SCHIZOPHRENIC
BY AVERSIVE THERAPY

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The purpose of this experiment was to investigate the modification of behavior of a thirty-five-year-old, hospitalized, chronic schizophrenic male. The hypothesis was that the patient's aggressive and self-injurious behavior could be modified through the use of aversion therapy.

The subject had a long history of aggressive and self-injurious behavior. He had been hospitalized for seventeen years. He had to be restrained constantly. Numerous treatment plans had been tried unsuccessfully, including 166 insulin shock treatments and 26 electro-shock treatments. Drug therapy, although being continued, was ineffective.

The apparatus used for this experiment were a lockroom and therapy room. The therapy room had an electrical grid floor which was connected to the shock apparatus. Various food and smoking reinforcers were used as well as social reinforcement.

A baseline was taken before a two-hour structured program was begun in the lockroom. Later the structured program was carried out in the therapy room. Eventually the patient was able to sit unrestrained on the ward during the day under

the supervision of the ward personnel. The data for this experiment were the observation and records of his behavior.

The experiment was considered a success since the data revealed no inappropriate behavior during the post-experimental baseline. Also, the patient was able to function on the ward without exhibiting maladjustment of behavior.

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A review of the literature reveals a variety of research and numerous methods of treating schizophrenics. According to Ullman and Krasner (1969), schizophrenic reaction are numerically the largest and theoretically the most important group within the psychoses. They report that roughly 20 per cent of all first admissions to psychiatric hospitals were categorized as schizophrenics; furthermore, approximately half of all patients remaining in psychiatric hospitals were diagnosed schizophrenics. The American Psychiatric Association's definition of schizophrenic reaction is as follows:

This large category includes a group of disorders manifested by characteristic disturbances of thinking, mood, and behavior. Disturbances in thinking are marked by alterations of concept formation which may lead to misinterpretation of reality and sometimes to delusions and hallucinations, which frequently appear psychologically self-protective. Corollary mood changes include ambivalent, constricted and inappropriate emotional responsiveness and loss of empathy with others. Behavior may be withdrawn, regressive, and bizarre [DSM-II, 1968, p. 33].

Ludwig (1968) described an experimental program designed to evaluate a number of psychosocial techniques for the treatment of chronic schizophrenics. The underlying hypothesis of this treatment research program was that nonpsychiatric approaches to healing and behavior modification contained

potent healing influences. They hypothesized, contrary to current theory, that the so-called "nonspecific" common denominators of all healing practices might well represent the "specific" factors responsible for mental healing. During the experimental treatment period, patients participated in a variety of group meetings, each of which was designed to capitalize on nonspecific influences such as emotional arousal, suggestion, and inspiration, moral suasion and indoctrination, explanation, and the social reinforcement of behavior. Statistical analyses of the behavioral ratings of patients indicated a greater, statistically significant improvement in patients following their participation in the experimental treatment program compared to the control treatment program. During the experimental program, patients showed steady improvement over the first six weeks with a leveling effect noted during the latter four weeks.

Krasner (1971) stated that implicit in early operant studies of Lindsley and Skinner was a view of schizophrenia as a collection of undesirable behaviors. He pointed out that the key behavioral indicants for the label of schizophrenia were disorganization of thinking, apathy, social withdrawal, and verbalizations that were bizarre or aversive to listeners. He reported a series of operant studies designed to change specific behaviors of schizophrenics which in effect, was treating schizophrenia by changing its component behavior.

Interest in aversive conditioning has increased dramatically in the past ten years, and many research papers have been reported which investigated the variety of behaviors that could be elicited, suppressed, learned, or conditioned as a result of aversive stimulation or its removal. In the Annual Review of Psychology, Krasner (1971) wrote that aversion therapy was the most controversial of the major techniques of behavior therapy in terms of theory and ethical implications. Within the context of behavior there were two broad types of aversive methods, those derived from operant and those derived from classical theory. Also, in aversive procedures, consideration must be given to the relationship between the punisher and the punished. The variables of the social influence base were as basic to aversive conditioning as to other behavior therapy procedures. Three other techniques derived mainly from the operant approach belong within the aversive group: satiation, the excessive use of positive stimuli; time out, access to positive reinforcement being blocked contingent on occurrence of an undesirable behavior; and response cost, reinforcement penalties per response.

Bucher and Lovaas (1968) in their article presented the problems of aversive stimulation and the justification for using it in spite of the problems concerning its effectiveness, unpredictable and often undesirable side effects. Also, they discussed several ways in which aversive stimuli could be used therapeutically. First, it could be used as punishment, which

meant it could be presented contingent upon certain undesirable behaviors, so as to suppress them. According to the authors this was perhaps the most obvious use of aversive stimulation. Next, aversive stimulation could be removed or withheld contingent upon certain behaviors. That is, certain behaviors could be established and maintained because they terminated aversive stimulation or avoided it altogether. Escape and avoidance learning exemplified this. A third way in which aversive stimulation could be used was to build stimulus functions. One such use was as a reinforcer in a classical conditioning situation, to create conditioned aversive stimuli. Another possibility that the authors reported to be less well known and most intriguing was a stimulus which was associated with, or discriminative for, reduction in aversive stimuli. This associated stimulus might acquire positive reinforcing or rewarding properties. This meant an organism would work to produce or obtain stimuli that had been associated with reduction of aversive stimulation. The action of such relief stimuli was analogous to that of stimuli whose positive reinforcement properties derived from primary positive reinforcers. These various uses of aversive stimuli might be combined in a single experimental procedure.

Another article which discussed the effectiveness of aversion therapy was by Kushner and Sandler (1966). They believed that since aversion therapy was designed to reduce the probability of response frequency, such attempts could be best

understood within a punishment framework. A number of variables had long been known to influence the punishment effect. The authors reported that the importance of the temporal relationship between response and noxious stimulus had been confirmed on several occasions. Another relevant variable was the intensity of the punishment. The duration of the punishment, duration of response acquisition, and the age of the organism appear to be factors, also, of some importance. The effects of punishment on behavior maintained by positive reinforcement were generally distinguishable from the effects of punishment on escape or avoidance behavior; a reduction in response frequency was most likely to occur in the former instance whereas punishment in the latter procedure often resulted in an increase, at least initially, especially if the aversive stimulus had the same physical characteristics as that used to establish the escape-avoidance response. Thus, the reinforcement history of the response constituted a critical variable. At least one additional variable, the manner in which aversive stimuli were scheduled, seemed important: continuous punishment would exert a greater initial punishing effect than would partial punishment but the latter would result in greater durability of effect. All of these led the authors to conclude that the response to be reduced should be one which was maintained by positive reinforcement, or if of an escape-avoidance nature, the aversive stimulus should be of different physical dimensions than the stimulus used to

generate the initial behavior; the level of punishment should be clearly noxious but not so intense as to immobilize the organism; punishment should be presented contiguous with the response; punishment should be presented on a continuous basis, at least initially, after which a partial schedule might be considered.

Several journal articles concentrated on the different techniques of using aversion therapy. One of the first considerations when contemplating using aversion therapy must be a decision about the type of noxious stimulus to be employed. Experimenters had used noise, time-out from positive reinforcement, traumatic respiratory paralysis, and a combination of these methods. Rachman (1965) reported the advantages and disadvantages of the chemical and electrical methods and drew attention to the possible superiority of the electrical method. McGuire and Vallance (1964) presented a simple apparatus which could deliver a painful electric shock to the subject. They believed the technique was simpler, more accurately controlled, and more certain in producing an unpleasant effect than drugs. Another advantage over drugs, they pointed out, was that their apparatus allowed the patient to treat himself even at home.

Pare (1969) conducted an experiment to determine the age, sex, and strain differences in the aversive threshold to grid shock in the rat. Using a spatial preference test with a rectangular tilt cage and plotting the aversive threshold for shock grid, he found that female rats and younger rats

demonstrated lower threshold values, but these results were influenced by body weight, because a covariance analysis indicated that shock sensitivity was directly related to body weight.

The relative aversiveness of subcutaneous shock and footshock in the rat was investigated by Campbell and Moorcroft (1970). Assessing the relative aversiveness by means of a spatial preference technique, the data supported the finding that subcutaneous shock was less aversive than footshock by a factor of ten, except at near-lethal shock intensities, where receptor-cell hyperpolarization, electrocauterization, and/or muscular tetanization might have occurred. Therefore, in view of the lengthy surgery, expense, poor recovery rate, and high amounts of current needed, the experimenters concluded that subcutaneous shock was clearly not suitable for general use.

Kraft (1970) argued that aversion therapy might lead to suppression of undesired behavior without altering the underlying disturbances which originally led to the behavior. He stated that chemical aversion had been largely replaced by electrical aversion and suggested a further modification of the technique by combining aversion therapy and imaginal stimuli under conditions of relaxation such as in covert sensitization or desensitization of the patient to his underlying difficulties might be more helpful and might lead to a more permanent recovery.

Numerous experiments had been reported on using aversion therapy to treat a wide variety of problems, from compulsive eating to chronic schizophrenia. Compulsive eating had been treated by aversion therapy. Rachman and Teasdale (1969) concluded that although experimental evidence was limited, it suggested that a passive association of food stimuli and shock may well produce a fear of the stimuli, but does not necessarily interfere with the act of eating. If the aversive stimulation was delivered during the sequence of activities which led up to, and/or included eating, then the organism might cease eating, even for extended periods. Rachman and Teasdale further stated that there was evidence that, under certain conditions, eating and anxiety were reciprocally inhibiting.

Vogler (1970) designed an experiment on the electrical aversive conditioning of chronic alcoholics because he thought that previous studies suggested the utility of electrical aversion conditioning but had failed to include adequate controls. His study compared pseudoconditioning, which was random shock delivery, sham conditioning, which was no shock, and ward controls, which were routine hospital treatment with two conditioning groups: conditioning-only, which was contingent shock, and booster subjects, which were additional conditioning sessions after release from the hospital. The conditioning groups were shocked for drinking and reinforced by shock termination for spitting out the alcohol. From the

data, the experimenter concluded that electric aversion conditioning method prolonged the period of sobriety after release from the hospital and might have long-term effectiveness in controlling drinking behavior.

Also, aversion therapy had been used with sexual deviant behavior. Abel, Lewis, and Clancy (1970) studied aversion therapy as applied to taped sequences of deviant behavior in exhibitionism, transvestism, and masochism. Tapes were made involving descriptions of each subject's individual deviant behavior (three cases of exhibitionism, two of transvestism, and one of masochism) divided into three sequential segments. Five of the six subjects were placed on a schedule on which, at first, the final segment of the tape was followed by shock, at a later session, the second segment, and ultimately the first. At each session the shocked tape runs were followed by runs in which the patient avoided shock by verbalizing normal sexual behavior in the place of the shocked segment. The sixth subject was given shocks out of relation to the taped material as a control. The experimental subjects reported weaker deviant responses, less frequent deviant behavior, and fewer symptoms of psychopathology in general.

Rachman and Teasdale (1969) reported that electrical aversion had been employed with apparent success in the treatment of transvestites, fetishists, homosexuals, masochists, and exhibitionists, but the total number of cases reported was still small and there remained a need for control studies.

They stated that no clear and unequivocal instances of symptom substitution had been reported. General improvements in adjustments had often followed successful treatment. Some attempts to re-direct and improve normal sexual behavior were described and the encouragement of normal sexual fantasies during masturbation seemed promising. The use of hormones had not been successful.

Another was in which aversion therapy had been used with the mentally retarded. Lovaas and Simmons (1969) conducted five studies, carried out on three severely retarded self-destructive children, in which they observed an immediate suppression of self-destructive behavior when aversive stimuli were given contingent upon that behavior. The effects of shock appeared to be specific to the situation in which shock was used, with respect to both physical locales and attending adults. That meant that if punishment to suppress self-destruction was to be maximally therapeutic it had to be administered by more than one person, in more than one setting. Moreover, they found that there was an immediate increase in socially directed behavior, such as eye-to-eye contact and physical contact, as well as the simultaneous decrease of a large variety of inappropriate behaviors, such as whining, fussing, and facial grimacing.

Gardner (1969) reviewed the use of punishment procedures with the severely and profoundly retarded. He concluded that the studies reviewed lent some support to the feasibility of

application of a variety of punishment procedures in work with the severely and profoundly retarded person. He warned that until further data were available, the use of punishment techniques in clinical practice should be preceded by a careful consideration of alternative procedures. In those instances in which punishment was the treatment of choice, highly controlled procedures of delivery of punishment and measurement of effects as dictated by a functional analysis of behavior approach should add considerably to its clinical value.

Several studies had been done using aversion therapy with autistic children and schizophrenics. Lovaas, Schaeffer, and Simmons (1965) investigated the building of social behavior in autistic children by using electric shock. Three experimental studies were carried out on two five-year-old identical twins diagnosed as childhood schizophrenics in an attempt to modify their behavior. Their autistic features were pronounced; they manifested no social responsiveness, speech, nor appropriate play with objects. They engaged in considerable self-stimulatory behavior, and in bizarre, repetitive bodily movements. These children had not responded to traditional treatment efforts, so it was decided to induce pain by means of an electrical grid on the floor upon which the children stood. The shock was turned on immediately following pathological behaviors. It was turned off or withheld when the children came to the adults who were present. The children learned to approach adults to avoid shock. Shock was

effective in eliminating pathological behavior, such as self-stimulation and tantrums. Affectionate and other social behavior towards adults increased after adults had been associated with shock reduction.

Simmons and Lovaas (1969) used aversive stimuli in behavioral control with nine children diagnosed as suffering from childhood schizophrenia and moderately severe retardation. Painful stimuli were administered, using electric shock and slapping, both of which were always paired with admonitory words. These words took on reinforcing powers and soon replaced the primary stimuli as control techniques. The evidence led the experimenters to conclude that in clinical settings, punishment seemed to have possible application: (1) the establishment of people as positive and significant reinforcers by being paired with pain reduction; (2) the use of pain to suppress self-destructive behaviors in patients otherwise requiring continual control; and (3) the establishment of certain acceptable behaviors through escape or avoidance.

Yeakel, Salisbury, Greer, and Marcus (1970) described an appliance designed to control the self-injurious behavior of a fourteen-year-old female autistic child. The patient presented many of the typical symptoms of autism, with poor communication, no speech, and a severe problem of constant head banging. The appliance, which was worn like a bonnet or hat, delivered an adverse electric shock to the arm of the patient whenever the head was struck either by the patient

herself or some extraneous inanimate object. This relatively uncomplicated appliance seemed to have very positive effects in modifying an unwanted behavior pattern.

Aversive control of self-injurious behavior in a psychotic boy was studied by Tate and Baroff (1966). Their study indicated how quickly and effectively chronic self-injurious behavior (SIB) was controlled in a nine-year-old psychotic boy. In the first study, the self-injurious responses were punished by contingent withdrawal of human physical contact. In the second study, response-contingent electric shock was employed. Both punishment procedures effectively reduced SIB in this psychotic boy. Aversive control by withdrawal of physical contact was immediately effective. Aversive control by painful electric shock also reduced the SIB immediately and had remained effective over a six-month period. In addition, it was found that eating behavior could be reinstated, posturing could be stopped, and saliva-saving and clinging could be terminated by firm commands followed by the sound of the shock apparatus if there was no compliance, and followed by social reinforcement if compliance occurred.

Weingaertner (1971) did a study on self-administered aversive stimulation with hallucinating hospitalized schizophrenics. Forty-five hospitalized hallucinating veterans were randomly assigned to three groups. Patients in the self-shock group carried a box on the belt which gave shock upon pressing the plunger. These patients were told to shock themselves

each time they experienced hallucinating voices. Patients in the placebo group carried a box which gave no shock and were given the same instructions. The no-treatment group received only the pre- and post-evaluations which were given all subjects. All groups showed significant decreases in hallucinating over a two-week period. No significant differences between groups were found. Therefore the experimenter concluded that placebo was the primary agent of change. Conscious cognitive factors seemed central to the improvement.

The control of violent behavior through faradic shock was investigated by Ludwig, Marx, Hill, and Browning (1969). Their experiment dealt with the use of faradic shock administered as punishment for the purpose of curbing the assaultive and violent behavior of a thirty-one-year-old, hospitalized, chronic schizophrenic female. Three levels of behavior were chosen for modification: 1) aggressive acts, 2) verbal threats, and 3) accusations of persecution and abuse. The results indicated that a marked reduction in the incidence of the behavior on all three levels was accomplished.

These studies led the experimenters to investigate the use of aversion therapy with a chronic schizophrenic who had been hospitalized for seventeen years. After all types of conventional therapy, such as electro-shock, insulin shock, and drug, had been exhausted, the patient still exhibited aggressive and self-injurious behavior. After considering the literature on the advantages and disadvantages of the

different methods of aversion therapy, it was decided to use aversive electric stimulation. Since a cattle prod had been previously used, it was assumed it was unsuccessful due to the social reinforcement of having a person administer it. Therefore, an electric grid floor was used; Lovaas, Schaeffer, and Simmons (1965) had successfully used an electrical grid in modifying the behavior of autistic children. Also, Campbell and Moorcroft's study (1970) supported the fact that footshock was more aversive than subcutaneous shock. As the journal articles presented evidence that the positive reinforcement of appropriate behavior could be combined with aversion therapy, the experimenters positively reinforced appropriate behavior, and withdrew it when his behavior was inappropriate.

The hypothesis of this study was that the patient's aggressive and self-injurious behavior could be modified through the use of aversion therapy. Electric aversion therapy was operationally defined as the use of an electrical grid floor which produced an aversive shock. Withdrawal of positive reinforcement was combined with electric aversion therapy.

Method

Subject

The subject was a thirty-five-year-old, hospitalized, chronic schizophrenic male, who had a long history of aggressive and self-injurious behavior. He had a normal childhood. He was rather reclusive, but did attend church activities

regularly until the onset of his maladaptive behavior. The subject quit school after completing the eighth grade. He held various unskilled labor jobs after that. He became hostile and aggressive toward employers, family, and neighbors.

The patient's first hospitalization was for two months in 1955, at a University of Texas medical branch. During this time, his treatment consisted of tranquilizing drugs and twenty-nine insulin shock treatments. This resulted in only marginal adjustment on an open ward.

Three months after his release, the subject became unmanageable again and was admitted to a state hospital, where he has remained to the present time. Numerous treatment plans had been tried and had failed, including a total of 166 insulin shock treatments and 26 electro-shock treatments. The patient became more hostile and violent, regressing to the point where he had to be restrained all the time and exerted no control over bodily functions. In December, 1969, the patient began to exhibit self-injurious behavior which markedly increased as time passed.

Apparatus

Two rooms were used for this experiment. Both rooms were on the same ward but not adjoining. The first room was a lockroom divided by bars into two cells, each approximately 6' x 9'. The lockroom had three windows, two being in the patient's cell. The other room was 12' x 14', with two windows. The air vent was covered with wire mesh. In this room, 2400

feet of Sears galvanized 18-gauge wire (13K22055c) were laid with metal staples on 3/4" plywood to make the shock grid. The shocking apparatus was a Sears Fence Charger (13K22012) 120 volts, 60 cycles, with a rheostat to regulate shock intensity, all mounted in a wooden box. A contact button was connected to the fence charger and rheostat for shock administration. While in the room the patient was observed through a one-way 8" x 8" mirror installed in the door. Various food and smoking reinforcers were used.

Procedure

Before the baseline was taken, the ward personnel were oriented to the concepts and theories of the program. They were told that until the electrical grid was completed, the patient would be on a differential reinforcement of other behavior (DRO) schedule. This was explained as reinforcement of any behavior, regardless of what it was, other than inappropriate behavior (Whaley & Malott, 1971). The experimenters informed the staff that the program was based on an operant conditioning paradigm, rather than a classical conditioning one. The difference was explained on the basis that reinforcement in operant conditioning followed the emission of a response whereas in classical conditioning, reinforcement was the pairing of an unconditioned stimulus with a neutral or conditioned stimulus (Wenrich, 1970). When the floor was finished, during the time he was on the structured program, the subject would continue to receive positive reinforcement

on an intermittent schedule, but would receive an aversive faradic shock when exhibiting inappropriate behavior. Also, the aversion therapy would include the withdrawal of positive reinforcement when responses were aggressive or self-injurious. Shock would be administered only while he was on the program and only by authorized personnel. To further understand the experiment, the ward personnel were given A Primer of Behavior Modification (Wenrich, 1970), and Elementary Principles of Behavior (Whaley & Malott, 1971) to read.

The phases of the procedure were pre-experimental baseline, lockroom period, therapy room period, and post-experimental baseline. A pre-experimental baseline was taken in order to determine the behaviors to be extinguished and those to be reinforced. A four-day baseline was taken during which the experimenters observed and recorded all of the patient's behavior, both verbal and physical. A week elapsed before the patient started on a two-hour structured program. The two-hour structured program was designed to give the patient planned activities in which he could act-out but could not hurt himself or another person. During this time, he was kept in the lockroom and an interaction was planned for every fifteen minutes. The program (Appendix A) was written out verbatim and given to the ward personnel in order to familiarize them with the routine. The two-hour structured program was carried out in the lockroom for four weeks.

The patient was placed in the room with the shock grid (therapy room) and shocked twice noncontingently in order for the patient to experience the aversiveness and for the experimenters to observe his reaction. The next day the two-hour structured program was carried out in the therapy room.

During the period the patient was in the therapy room, he was given an opportunity to act-out under circumstances in which no one could be injured. Also, when he did act-out he could be punished immediately. When control of the patient was established during the structured times, the program was revised and increased one hour until the patient was on the program for twelve hours (Appendix B). This took a period of six weeks. As the program was continued the patient's behavior was gradually shaped and he was faded back into the ward and the ward personnel were faded into administering the program, until he was out on the ward all the time and the ward personnel had control of him.

Another baseline was taken after the patient had been totally out of the therapy room for one week. This was to observe which responses had been extinguished and which had been increased. At this time, the experimenters observed and recorded his behavior. This record of behavior was compared to the first baseline.

Results

The data were the written records of the patient's behavior. The percentage of inappropriate behavior was calculated and plotted for the pre-experimental baseline and the two-hour structured program while he was in the lockroom (Appendix C). The percentage of inappropriate behavior was higher (90 per cent) during the pre-experimental baseline period than during the structured period, when at times the percentage was 0.

While the structured program was being carried out in the therapy room, the cumulative number of shocks per hour was plotted against the days (Appendix D); this showed a decrease in the number of shocks. The number of shocks per hour was then divided into three categories: self-injurious, aggressive, and interaction with the door (the number of times was great enough for the experimenters to separate it from aggressive behavior). These were then plotted (Appendix E); self-injurious behavior was the first to be extinguished.

The appropriate behavior observed during the pre-experimental and post-experimental baseline periods was recorded and placed into a table (Table I) for comparison. The responses were divided into response classes: eating, verbal, interpersonal, and non-interpersonal. The number of appropriate responses had increased during the intervening time.

TABLE I
APPROPRIATE BEHAVIOR

Behavior	Pre-experimental Baseline Period	Post-experimental Baseline Period
Eating	With utensils alone on lockroom floor Neat Uses napkin	With utensils with other patients at lobby table Neat Uses napkin
Verbal	Minimal initiation of conversation	Frequent initiation of conversation Gives appropriate answers to questions
Inter- personal	Returns waves and smiles Returns hand shakes Occasionally lifts feet for patient to mop under them Follows orders	Initiates waving and smiling Initiates hand shaking Helps patients with mopping and sweeping Follows requests and suggestions Seeks company of thers Plays table games
Non-inter- personal	Showers himself Dresses and un- dresses self	Showers and shave him- self Dresses and undresses self Urinate and defecates in bathroom Entertains self by watching TV Reads newspaper Writes letter Sits quietly in lobby

The inappropriate behaviors were observed and recorded during the pre-experimental and post-experimental baseline periods. These were recorded in a table for comparison (Table II). The inappropriate behavior had been extinguished.

TABLE II
INAPPROPRIATE BEHAVIOR

Behavior	Pre-experimental Baseline Period	Post-experimental Baseline Period
Eating	Throws empty metal trays Throws empty cups Throws beverages and food	
Verbal	Talks to self Gives inappropriate responses to questions Gives war-whoops	
Inter- personal	Grabs people Hits people Throws medication at attendants Throws objects at others Shoots finger-gun at others	
Non-inter- personal	Pulls ear Thumps self on head Fighting motion with arms Pinches neck Hits self in stomach	

A battery of psychological tests was given while the structured program was in progress. A psychological evaluation was written (Appendix F).

Discussion

The data showed a marked decrease in inappropriate behavior. The post-experimental baseline revealed an extinction of all inappropriate behavior and an increase in appropriate behavior. For example, the patient was no longer throwing objects at other people, nor was he trying to injure himself or others. Also, his verbal behavior had changed, he was verbalizing appropriately and was not talking to himself. Before the program was begun the patient exhibited self-injurious or aggressive behavior about 90 per cent of the time but after the program this rate had dropped to a percentage of 0. The patient had gone from having to be restrained and locked up to socializing freely with other patients, staff personnel, and visitors. This was attributed to the use of faradic shock and withdrawal of positive reinforcement. Although the medication was changed during the lockroom period, change was not attributed to it due to the fact that the inappropriate behavior had dropped to 0 before the medication change and he had previously been on the same medication without any observable behavioral change.

The reduction of inappropriate behavior was in accordance with the predicted expectation. Therefore the experimenters accepted the hypothesis that the patient's aggressive and self-injurious behavior could be modified through the use of aversion therapy.

APPENDIX A

STRUCTURED PROGRAM

10:00 BATHROOM

1. One attendant and one student go into lockroom, "Billy, you're going to the bathroom!"
2. "Billy, walk over to the door, turn around, sit down with your hands in your pockets."
If he doesn't follow instructions, leave immediately, return in 5 mins., repeat procedure.
3. One person stands behind the door as the other grabs Billy's arms.
4. One person on each side holding his arms, walk him into bathroom.
If he balks or tries to hit, take hold of arm tightly and hold behind back, return to lockroom and leave immediately; return in 5 mins. to repeat procedure.
5. Keep holding Billy's arms while he uses urinal (or) sit him on toilet.
If he tries to break loose, take hold of arms tightly and hold behind back, return to lockroom and leave immediately; return in 5 mins. to repeat procedure.
6. Attendant and student lead Billy back to the lockroom, still holding arms.
If he tries to break loose or hit anyone, hold arms tightly behind back, return to lockroom and leave immediately.
7. Billy is put inside door and door quickly closed.

10:15 Student goes in and asks, "Billy, how are you doing today?"
If Billy gives an inappropriate response or if he exhibits any inappropriate behavior, leave immediately, return in 5 mins.
If he gives appropriate answer, continue talking as long as he makes sense.

10:30 VITAL SIGNS

1. One attendant and two students go in, "Billy, it's time to take your blood pressure."
2. "Billy, walk over to the door, turn around, sit down with your hands in your pockets."
If he doesn't, leave immediately, return in 5 mins.

3. One person stands behind the door as he opens it, one person goes in and grabs Billy's arms, while other stands back out of way.
4. Other people go into lockroom, two hold Billy while third takes vital signs.
If Billy tries to jump up or any inappropriate behavior, hold tightly restraining further behavior until quiet, then leave. Return in 5 mins. to repeat procedure.
5. One person holds Billy while Billy's still sitting as others get out of cell.
6. Then last person lets go and quickly leaves, shutting the door behind him.

10:45 Student walks by in hall, looking in as passes to observe behavior.

11:00 MEDICATION

1. Student goes in, "It's pill time, Billy."
2. Medication and water are handed through the pass through. "Here are your pills, put them in your mouth and swallow them."
If he doesn't take pills immediately, leave, return in 5 mins. to repeat procedure.
If he takes pills and plays with them, repeat instructions as a command.
If he throws pills, check to be sure all pills are beyond his reach, leave, return in 5 mins. to repeat procedure.
3. After medication is taken, student leaves.

11:15 Student goes in, "Billy, is there anything you need?"
Leave if gives inappropriate behavior.
Continue talking as long as he makes sense.

11:30 BATHROOM

1. One attendant and student go in, "Billy, it's time to go to the bathroom."
2. "Billy, walk over to the door, turn around, sit down with your hands in your pockets."
3. One person stands behind door as he opens it, other person goes in and holds Billy's arms.
4. One person on each side of him, holding arms, walk him to the bathroom.
If he balks or tries to hit, take hold of arms tightly and hold behind back, return to lockroom and leave immediately. Return in 5 mins. to repeat procedure.
5. Billy is asked, "Do you need to urinate before washing your hands?"
If he does, take him to urinal.

6. Holding on to his arms, take him to sink so he may wash his own hands.
If he tries to misbehave, take hold of his arms tightly behind back and return to lockroom.
Return in 5 mins. to repeat procedure.
7. After he has finished washing and drying his hands, Billy is told, "Billy, put your hands back into your pockets."
If he slings water, tries to hit, or break loose, hold arms tightly behind back and return to lockroom.
8. Attendant and student hold arms, return to lockroom.
If he misbehaves, hold arms tightly behind back and return to lockroom. Leave.

11:45 Student goes in, "Billy, are you getting hungry?"
If answers appropriately, continue talking.
Leave if gives inappropriate response.

12:00 LUNCH

1. Attendant or student goes in.
2. "Billy, are you ready to eat?" "Here's your tray, eat your lunch." Tray is slid under door.
If his response is inappropriate, ignore him and return to clean up mess after 10 mins. has passed--do it quickly and quietly as possible.

APPENDIX B

BILLY'S PROGRAM

*Billy will be shocked only by authorized personnel.

6:00 WAKE-UP

1. Student or Attendant goes in and turns on light.
If he doesn't wake-up, flicker light.
If he does, reinforce him with smile and "good morning".

6:15 MAKE-UP BED AND CLEAN ROOM

1. "Billy, make up your bed. Here's a broom to sweep out your area."
If he doesn't, repeat instructions once more; if not successful, leave taking broom with you and repeat procedure in 5 mins.
If he does, talk to him while he works and as long as he talks sensibly.
If he throws or hits, put him into therapy room and shock once.

6:30 BATHROOM

1. Student or attendant goes in, "Billy, you're going to the bathroom."
If Billy doesn't come, or tries to bolt out door, close door immediately, return in 5 mins. to repeat procedure.
2. Student and Attendant walk beside Billy to bathroom.
If Billy exhibits any inappropriate behavior, restrain him, bring him back to therapy room as quickly as possible. Shock once. Return in 5 mins. to repeat procedure.
If Billy doesn't act out, talk to him as long as he talks sensibly.
3. Student or Attendant stands outside door at desk and waits for Billy as Billy goes in bathroom alone.
If Billy doesn't come out in reasonable time or if any disturbance is heard inside, student or attendant goes in to check on Billy. If Billy is exhibiting inappropriate behavior, restrain him, bring him back as quickly as possible. Shock once. Repeat procedure in 5 mins.
4. Student or Attendant walks beside Billy to therapy room.
If he acts out, restrain him, bring him back as quickly as possible. Shock once.
If he doesn't act out, talk to him as long as

he makes sense.

5. When at room, thank him and close door.
If he tries anything, close door quickly. Shock once.

6:45 LOBBY

1. Student or attendant opens door to therapy room.
"Billy, it's almost time for breakfast. Let's go to the lobby to wait for them to call for trays."
If he exhibits inappropriate response, close door quickly. Shock once. Return in 5 mins. to repeat procedure.
2. Student or attendant walks with Billy to the lobby.
"Billy, sit down and relax until they call for trays."
Talk to Billy if he acts appropriately.
If he doesn't, restrain him, return to therapy room. Shock once. Repeat procedure in 5 mins.

7:00 BREAKFAST

1. When trays are called, student or attendant, "Billy, let's go down and get your tray."
If Billy tries anything, restrain and return to therapy room. Shock once. Repeat procedure in 5 mins.
2. Student or attendant walks beside Billy to get tray and bring it back to lobby.
If Billy exhibits inappropriate behavior, leave tray, restrain him, return to therapy room. Shock once.
If he exhibits appropriate behavior, talk to him as long as he makes sense.
3. When back in lobby, "Billy, find you a place to eat."
If Billy acts out, leave tray, restrain him, return to therapy room as quickly as possible.
Shock once.
4. After Billy has finished eating, remove tray. "Billy, sit back and relax here for awhile."
If he tries anything, restrain him, return to therapy room. Shock once.
If he doesn't try anything, let him sit in lobby until time for medication.

7:15 MEDICATION

1. When attendant at desk calls for medication, "Billy, it's pill time, better go get your pills."
If Billy doesn't go get pills, repeat instructions once more.
2. Attendant hands Billy his pills, "Billy, put them in your mouth and go over to the water fountain to get a drink and swallow them."
If he exhibits an inappropriate response, take hold of arms tightly behind back, and return to

- therapy room as quickly and quietly as possible.
Shock once. Repeat procedure in 5 mins.
3. After Billy has taken a drink and swallowed pills, "Billy, let's go back to your room." Student or attendant walks beside him back to room.
Talk to Billy as long as he gives appropriate response.
Restrain and return to room if he doesn't. Shock once.
 4. Student or attendant thanks Billy and closes door.
If he exhibits inappropriate behavior, shock once.

7:30 SHOWER AND SHAVE

1. Student or attendant opens door, "Billy, go to the bathroom for your shower and shave."
Close door and shock once if he tries anything.
2. Student or attendant walks beside Billy to bathroom.
Talk to him as long as he acts appropriately; otherwise, restrain him, return to room. Shock once. Repeat procedure in 5 mins.
3. Student or attendant instructs Billy to remove his clothes and get into the shower.
If he tries anything, restrain, dry him if wet, put bathrobe on him and return to therapy room as quickly and quietly as possible. Shock once.
Return in 5 mins. to repeat procedure.
4. After Billy is in shower, give him soap. "Take your shower, Billy." If he acts out, restrain him, dry him off, put bathrobe on him and return to therapy room as quickly and quietly as possible. Shock once.
Return in 5 mins. to repeat procedure.
5. When Billy has finished showering, give him a towel. "Billy, dry off." Then give him clean clothes. "Billy, here are some clean clothes to put on."
If he gives inappropriate response, dry and dress quickly as possible, return to room. Shock once.
Repeat in 5 mins.
6. "Billy, here's a razor for you to shave with."
If he nicks himself, ignore it if places tissue on it to stop bleeding, otherwise student or attendant very casually and impersonally puts tissue to stop bleeding--don't give him extra special attention!
If he exhibits inappropriate behavior, remove razor, restrain and return to room. Shock once.
Repeat in 5 mins.
7. After he is through shaving, compliment him on how nice he looks. "Billy, let's go back to your room." Student or attendant walks beside him back to room.
If he tries anything, restrain him and return to room. Shock once.
Talk to him as long as he talks sensibly.

8. Student or attendant thanks him and closes door.
If Billy exhibits inappropriate behavior, shock once.

8:00 CLEAN UP ON WARD

1. Student or attendant opens door. "You're going to help them clean the ward today."
2. Give him broom or mop and inform him which area he is to clean.
Praise him and talk to him as long as he works and responds sensibly.
Remove mop or broom if he tries anything and return to room. Shock once. Return to repeat procedure in 5 mins.
3. Thank him when he has finished. "You may go watch TV in the lobby for awhile."
If he doesn't act out, let him stay in lobby; otherwise restrain and return to room, shock once.

- 8:15 Student or attendant asks, "Billy, are you tired?"
Continue to talk to him as long as he talks sensibly.

8:30 VITAL SIGNS

1. "Billy, it's time to take your blood pressure."
If in therapy room tell him to go sit in lobby.
2. Attendant takes vital signs. "Hold your arm out so I can take your blood pressure, Billy."
If he tries anything, remove blood pressure cuff, restrain and return to therapy room as quickly as possible. Shock once. Repeat procedure in 5 mins.
Talk to him if he cooperates and his responses aren't crazy.
3. Thank him when attendant has finished. Allow him to remain in lobby as long as he doesn't act out.
If he does act out, restrain, return to room. Shock once.

- 8:45 Observe and record Billy's behavior.

9:00 DAY TREATMENT CENTER

1. "Billy, would you like to go for a walk?"
Student or attendant walks beside Billy, talking to him, each day walking a little closer to DTC. Gradually work him into building and staying there.
As soon as he acts out, restrain and return as quickly as possible to therapy room. Shock once.

- 9:15 Student or attendant. "How are you doing today?"
Continue to carry on conversation as long as he isn't talking crazy.

9:30 TABLE GAMES AND WATCH TV

1. Student or attendant. "Billy, do you want to play some dominoes (checkers, cards) or watch TV?"
If Billy is in therapy room, tell him to go to lobby.
Have Billy help set up table and game equipment if he wants to play.
2. Involve other patients and attendants in table games. Let them play as long as they like unless Billy acts out, then return to room and shock.
Socially reinforce Billy as he plays games.

9:45 Observe and record behavior.

10:00 BATHROOM

1. Student or attendant. "Billy, do you want to go to the bathroom?"
2. Walk Billy to bathroom door, but allow him to go inside by himself. Wait for him at desk.
If Billy doesn't come out in reasonable time or if any disturbance is heard inside, student or attendant goes in to investigate.
If Billy's behavior is inappropriate, restrain him, take him to therapy room. Shock once. Repeat procedure in 5 mins.
3. When Billy comes out of bathroom, "Billy, sit in the lobby and watch TV for awhile."
Unless he acts out, let him sit in lobby.
If he acts out, restrain him and return to room. Shock once.

10:15 If in therapy room, "What's going on outside?"
Carry on conversation until he starts talking crazy.

10:30 OUTSIDE ACTIVITY

1. Student or attendant gets equipment, "let's go play softball (volleyball, etc.)." Walk beside him to area where going to play.
If Billy tries anything, restrain him, return to therapy room as quickly as possible. Shock once.
Repeat procedure in 15 mins.
Socially reinforce him while he's playing.
2. "It's about pill time so we'd better go in." Student or attendant walks beside Billy and return to ward.
If Billy acts out, restrain him and return to room. Shock once.
3. If medication is not ready. "Billy, rest in the lobby until they call for medication."
If he acts out, return to room and shock once.

11:30 MEDICATION

1. Attendant at desk calls for medication.
If Billy doesn't go, "Billy, go get your pills."
2. Attendant hands Billy his pills. "Billy, put them in your mouth and go over to the water fountain to get a drink and swallow them."
If he acts inappropriately, restrain and return to room. Shock once. Repeat in 5 mins.
3. After Billy has taken pills, "It's almost time for lunch, so sit down and wait in the lobby." Allow him to stay in lobby if he continues to respond appropriately.
If he exhibits inappropriate behavior, restrain and return to therapy room; shock once.

11:45 BATHROOM

1. Student or attendant, "Billy, go wash up for lunch."
2. Student or attendant waits for Billy at desk while he goes in alone.
If Billy doesn't come out in reasonable time or if any disturbance is heard inside, student or attendant goes in to investigate.
If Billy's behavior is inappropriate, restrain him, take him to therapy room. Shock once.
Repeat procedure in 5 mins.
3. When Billy comes out of bathroom, "Billy, sit in the lobby until they call for trays."
As long as Billy doesn't act out, he remains in lobby.
If he acts out, restrain, return to room. Shock once.

12:00 LUNCH

1. When trays are called, "Billy, let's go down and get your lunch." Student or attendant walks beside Billy to get tray and bring it back to lobby.
If he exhibits inappropriate behavior, leave tray, restrain and return to room. Shock once.
If he doesn't, talk to him as long as he makes sense.
2. When back in lobby, "Billy, find a place to eat."
If Billy acts out, leave tray, restrain, return to therapy room. Shock once.
3. After Billy has finished eating, remove tray. "Billy, sit back and relax in here for awhile."
If he tries anything, restrain and return to therapy room. Shock once.

12:30 REST PERIOD

1. Student or attendant, "Billy, you can go back and sleep on the bed next to your room." Student or attendant walks beside him back to his bed.

- If he doesn't respond, repeat instructions.
 If he tries anything, restrain him and return to therapy room. Shock once. Repeat in 5 mins.
2. Student or attendant observes Billy from chair in hallway.

1:30 BATHROOM

1. Student or attendant, "Billy, you're going to the bathroom."
2. Walk Billy to bathroom but allow him to go inside by himself. Wait for him at desk.
 If Billy doesn't come out in reasonable time or if any disturbance is heard inside, student or attendant goes in to investigate.
 If Billy's behavior is inappropriate, restrain him, take him to therapy room. Shock once.
 Repeat procedure in 5 mins.
3. When Billy comes out of bathroom, "Billy, sit in the lobby and watch TV."
 Unless he acts out, let him sit in lobby.
 If he acts out, restrain and return to room.
 Shock once.

1:45 Observe and record behavior.

2:00 RECREATION

1. Student or attendant, "Let's go play pool (basketball, etc.)." Walk beside him to area where going to play.
 If he tries anything, restrain him, return to therapy room as quickly as possible. Shock once.
 Repeat procedure in 15 mins.
 Socially reinforce him while he's playing.
2. "It's time to go back to ward." Walk beside him on way back to ward.
 If Billy tries anything, restrain him, return to therapy room as soon as possible. Shock once.
 Talk to him as long as he shows appropriate behavior.

3:00 BATHROOM AND CANTEEN

1. Student or attendant, "Want to go the bathroom?"
2. Walk Billy to bathroom but allow him to go inside alone. Wait for him at desk.
 If Billy doesn't come out in reasonable time or if any disturbance is heard inside, student or attendant goes in to check.
 If Billy's behavior is inappropriate, restrain him, take him to room; shock once. Repeat procedure in 5 mins.
3. When Billy comes out of bathroom, "Billy, let's go to the canteen."

4. Walk beside him to canteen, talking to him if he makes sense.
If Billy tries anything, take hold of arms tightly behind back, and return to therapy room as quickly and quietly as possible. Shock once.
Repeat procedure in 15 mins.
5. In canteen, go with Billy to counter, "Billy, order what you want." After receiving order, sit down at table.
If Billy acts out, restrain and return to room. Shock once.
6. Walk beside Billy back to ward.
If Billy exhibits inappropriate behavior, restrain and return to therapy room. Shock once.
7. On ward, "sit down and watch TV."

3:30 WATCH TV

1. If in therapy room, student or attendant, "Billy, let's go to lobby to watch TV." Walk beside him to lobby. "Sit down and watch TV."
If Billy acts out, restrain and return to room. Shock once.
2. Allow him to sit in lobby until he acts out, at that time, restrain and return to room; shock once.

3:45 Observe and record behavior.

4:00 TO HOSPITAL

1. Student or attendant, "Billy, let's go out for awhile." Student or attendant walks beside Billy talking to him, gradually work him into lying still long enough for EKG to be taken.
As soon as he acts out, restrain and return to room. Shock once.
2. "Billy, it's pill time, better go back to the ward." Walk beside him and return to ward.
If he tries anything, restrain and return to room. Shock once.
3. If medication is not ready, "Billy, rest in the lobby until they call for medication."

4:30 MEDICATION

1. Attendant at desk calls for medication.
If Billy doesn't go, "Billy, go get your pills."
2. Attendant hands Billy his pills, "Billy, put them in your mouth and go over to the water fountain to get a drink and swallow them."
If he acts inappropriately, restrain and return to room. Shock once. Repeat in 5 mins.
3. After Billy has taken pills, "It's almost time for supper so sit down and wait in the lobby." Allow him to stay in lobby if he continues to respond appropriately.

If he exhibits inappropriate behavior, restrain and return to therapy room. Shock once.

5:00 SUPPER

1. When trays are called, "Billy, let's go down and get your supper." Student or attendant walks beside Billy to get tray and bring it back to lobby. If he exhibits inappropriate behavior, leave tray, restrain and return to room. Shock once. If he doesn't, talk to him as long as he makes sense.
2. When back in lobby, "Billy, find a place to eat." If Billy acts out, leave tray, restrain, return to therapy room. Shock once.
3. After Billy has finished eating, remove tray. "Billy, sit back and relax in here awhile." If he tries anything, restrain, return to room, shock once.

5:30 BATHROOM

1. Student or attendant, "Billy, go to the bathroom."
2. Walk Billy to bathroom door, but allow him to go inside by himself. Wait for him at desk. If Billy doesn't come out in reasonable time or if any disturbance is heard inside, student or attendant goes in to investigate. If his behavior is inappropriate, restrain, return to room; shock once; repeat in 5 mins.
3. When Billy comes out of bathroom, "Billy, sit in the lobby and watch TV for awhile." Unless he acts out, let him stay in lobby. If he acts out, restrain, return to room. Shock once.

5:55 BACK IN LOCKROOM

1. Student or attendant, "Billy, it's time to go back to the lockroom." Walk beside him to lockroom. If he tries anything, restrain, return to therapy room. Shock once. Repeat in 5 mins.
2. Thank Billy and close door.

APPENDIX C

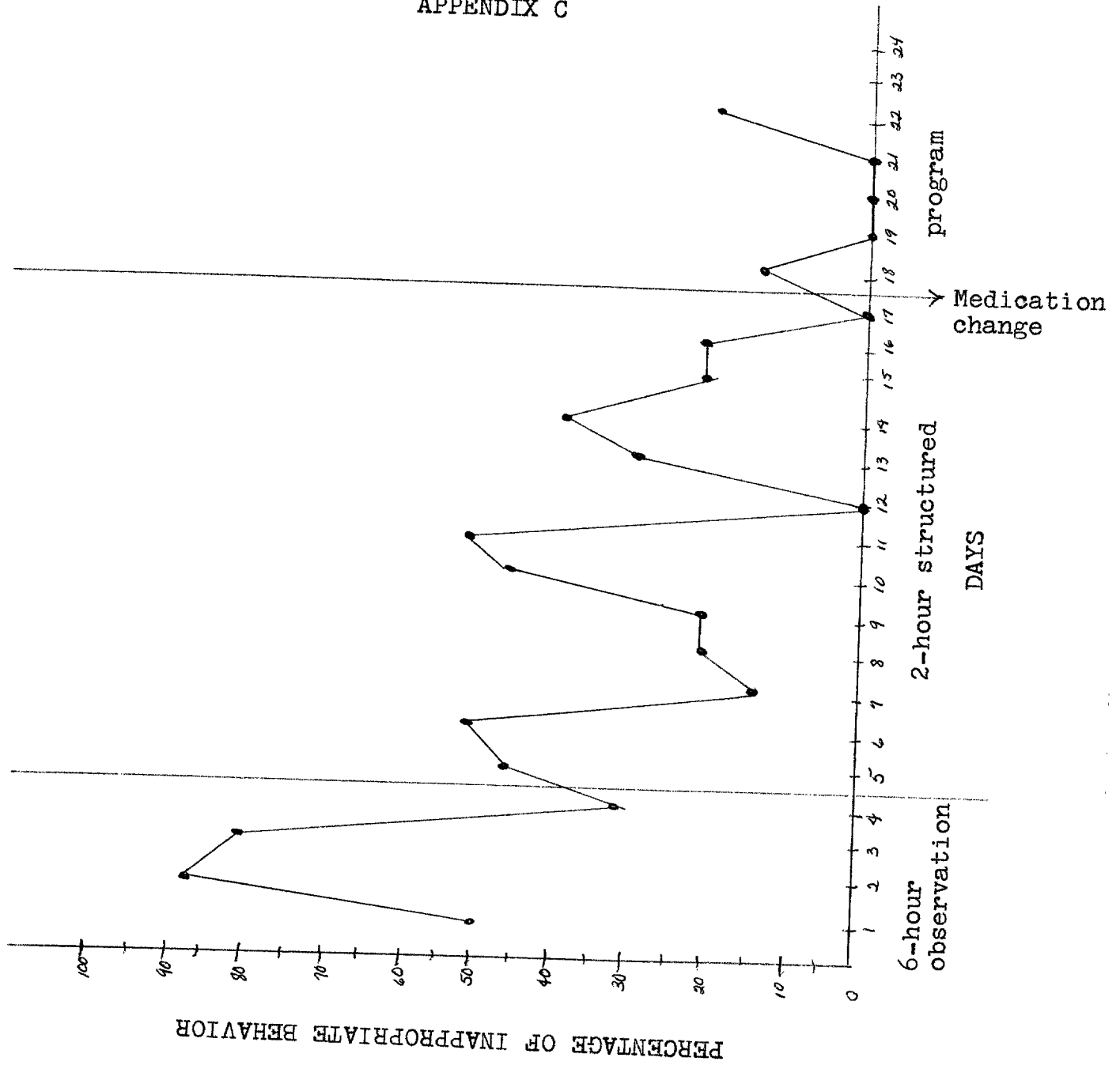


Fig. 1. The percentages of inappropriate behavior for the pre-experimental baseline and two-hour structured program in the lockroom.

APPENDIX D

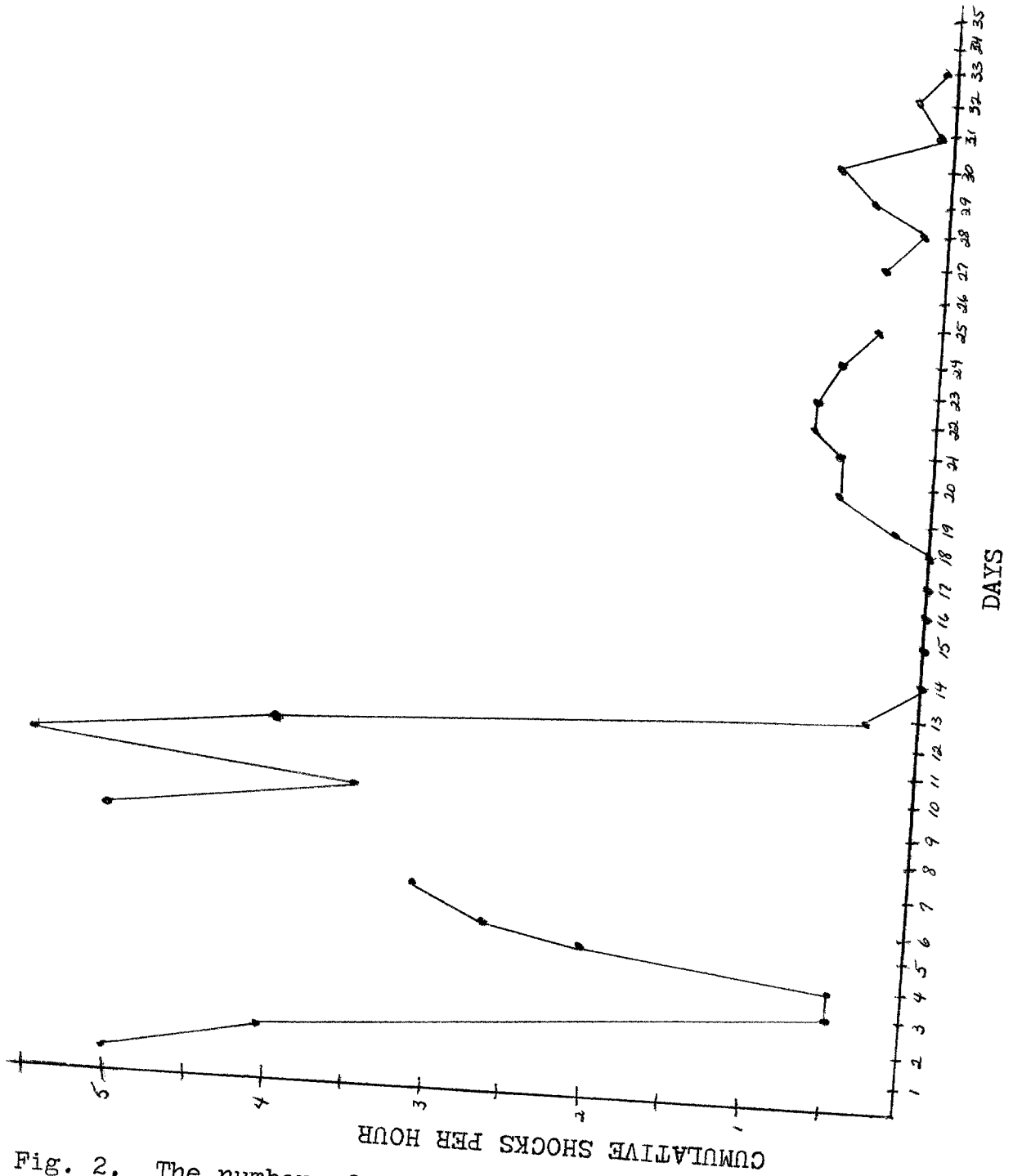


Fig. 2. The number of shocks per hour during the aversive therapy period.

APPENDIX E

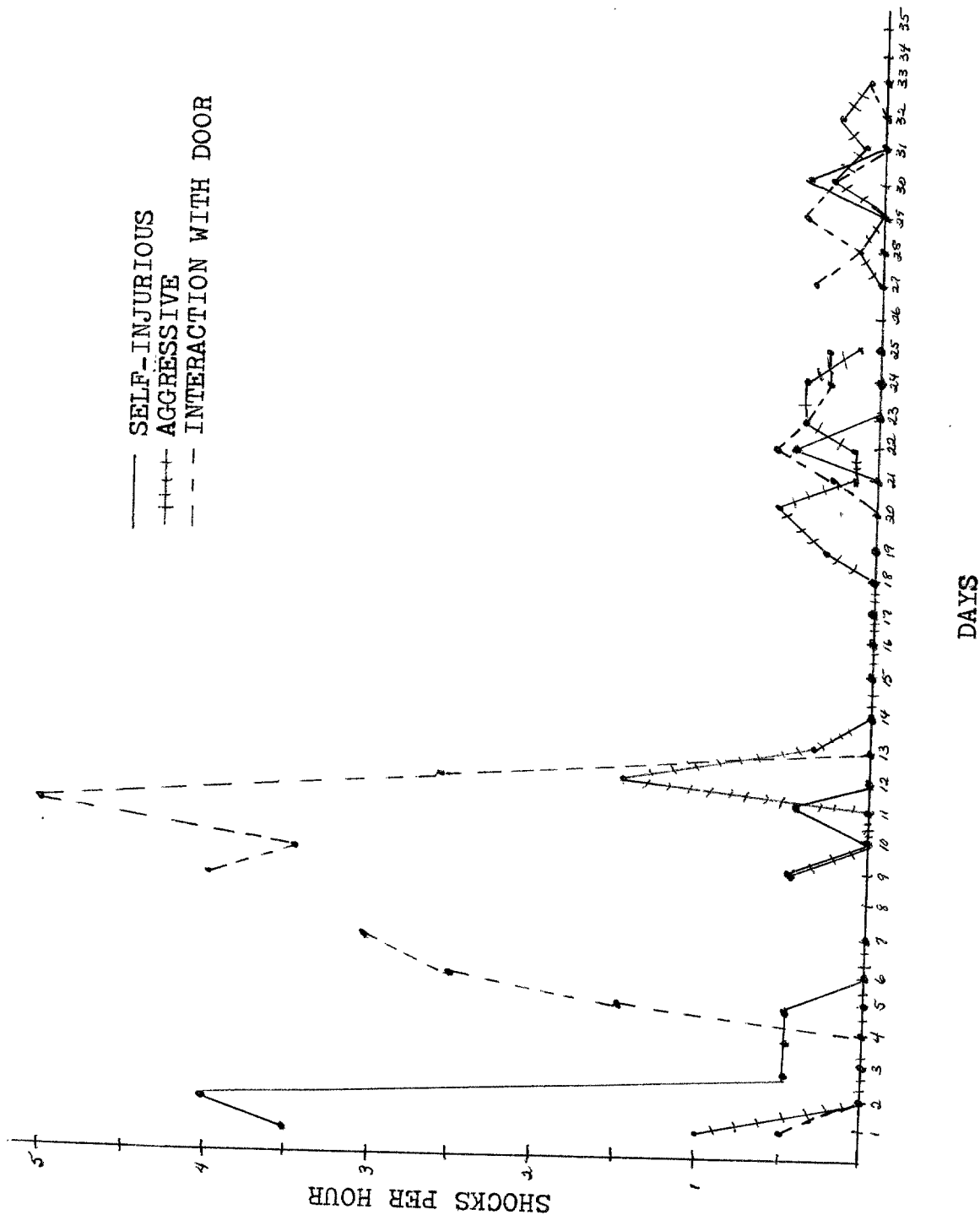


Fig. 3. Comparison of the three categories of inappropriate behavior.

Digit Symbol. He was functioning at the Mental Deficiency intellectual level at this testing.

DIAGNOSTIC IMPRESSIONS: Schizophrenia, chronic undifferentiated.

RECOMMENDATIONS:

- 1) Talk to him only when he's making sense.
- 2) Positively reinforce, social reinforcement as well as rewards, when he's acting appropriately.
- 3) Aversion therapy to extinguish self-injurious and aggressive behavior.
- 4) Recreational therapy to help release hostile feelings.
- 5) Industrial therapy when he can be trusted with tools.
- 6) Adult Education when more in contact with reality.

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