

# Use of Pain and Punishment as Treatment Techniques with Childhood Schizophrenics\*†

JAMES Q. SIMMONS, III, M.D.‡ |  
O. IVAR LOVAAS, PH.D.§ | *Los Angeles, Calif.*

## INTRODUCTION

In recent years, considerable attention has been directed toward the use of reinforcement therapy with children who fall within the broad category of disorders called childhood schizophrenia. For the most part, this approach has utilized positive reinforcement in the form of providing food, social approbation, or pleasurable activities for acceptable behaviors (1-6). However, the reinforcement paradigm provides another set of alternatives which has been minimally explored—the use of negative reinforcers or aversive stimuli to suppress unacceptable behaviors through punishment, and to facilitate the learning of acceptable behaviors through an escape or avoidance situation.

According to Church (7), there are basically three reasons why the use of punishment finds considerable opposition among psychologists: “(a) It is less effective than some of the alternatives; (b) It produces undesirable side-effects other than the reduction of the strength of the response, and (c) it is unkind to the individual.” These objections are, in part, supported by experimental evidence in which punishment results in response facilitation. This will be referred to later in the discussion. Perhaps the most serious objections result from commentaries such as those of Bandura (8), that punishment as a behavioral control device provides a model for aggressive behavior and may either augment the very response which the treatment was

\* Presented at the annual meeting of the American Psychiatric Association, Detroit, Mich., May 1967 and the Wisconsin Psychiatric Association meeting, Madison, Wis., February 1968.

† This work was supported in part by a grant from the National Institutes of Health (MH 11440-O1A1).

‡ Chief, Children's Inpatient Service, Associate Clinical Professor, Department of Psychiatry, University of California at Los Angeles. *Mailing address:* 760 Westwood Plaza, Los Angeles, Calif. 90024.

§ Professor, Department of Psychology, University of California at Los Angeles.

The authors wish to express their appreciation to the Nursing Staff of the Children's Ward of the Neuropsychiatric Institute, UCLA, for all of the support which made the carrying out of this project possible.

designed to control or lead to the establishment of other undesirable behaviors. For the most part, this statement is made in the context that punishment is primarily used to manage aggression.

The history of psychiatry offers much anecdotal evidence of the failure of punitive techniques to modify abnormal behavior. This type of evidence, combined with the comment by Szasz (9) in *Pain and Pleasure*, that medicine is "a socially structured defense against pain," makes it unacceptable on a social or ethical level to consider using pain as a tool to facilitate treatment. In addition to objections of a social or ethical nature, numerous theoretical formulations have postulated pain as a major factor in the etiology of psychopathology. For example, Freud (10), in *Beyond the Pleasure Principle*, noted, "The specific unpleasure of physical pain is probably the result of the protective shield having been broken through in a limited area. There is then a continuous stream of excitation—an anti-cathexis on a grand scale is set up—all the other physical systems are impoverished" (p. 36). Further, Freud states, "We describe as traumatic any excitations from outside which are painful enough to break through the protective shield," and "such an event as external trauma is bound to provoke a disturbance in a large scale in the functioning—and to set in motion every possible defensive measure" (p. 35).

Despite these theoretical and social objections, some findings seem to indicate that pain, when used as punishment, may serve some useful function in the modification of behavior. From an experimental point of view, the reviews of Solomon (11), Church (7), and Azrin and Holz (12), would support this contention. Without attempting to do justice to these exhaustive surveys of punishment—and the experimental literature on punishment is extensive—one can draw the following conclusions: (1) In general, punishment tends to alter behavior by suppressing responsiveness. The greater the intensity of the painful stimulus, the more effective it is in response suppression. (2) If punishment is given on a response contingent basis, there is greater suppression of the specific response being punished and less suppression of responses not being punished. Under these conditions there is less generalization of the emotional response to the painful stimulus. (3) In a situation where the individual has more than one response available, punishment for a "wrong" response facilitates response differentiation. (4) There is an inverse relationship between the amount of response reduction and the time interval between response and punishment; the shorter the interval, the more response reduction.

Despite this evidence, the use of punishment to modify deviant human behavior has been quite restricted. Perhaps this comes about because much of these data are based on animal research. However, the use of punishment in the society at large can be fairly well judged by Will Durant's comments in his *History of Civilization* (13). Durant quotes an early Egyptian manu-

script as follows: "The youth has a back and attends when he is beaten, for the ears of the young are placed on the back," and a former student who wrote to his teacher saying—"Thou did'st beat my back and thy instructions went in my ear." Over the several thousand years since these observations were made, we are still faced with the fact that punishment is fairly commonly used. This is exemplified by the results of the survey of Sears, *et al.* (14) on child rearing. The bulk of the mothers surveyed utilized physical punishment on their children at one time or another (p. 325), and the majority reported that it helped in rearing children. Despite this long history of usage, actual studies on punishment with human beings have been somewhat limited. The possible use of punishment as a treatment technique has been almost completely ignored.

Some studies have been done on the use of painful stimuli in the classical (respondent) conditioning situation, in such problems as alcoholism (15) and the sexual perversions (16). These are basically extensions of the well-known studies using chemical substances as aversive stimuli, particularly in alcoholism (alcohol paired with noxious stimuli in an attempt to make alcohol elicit the same aversive reaction as the noxious stimuli). Less known are the uses of punishment in an operant conditioning paradigm, which is at times difficult to distinguish from the respondent paradigm. The case reported by Boardman (17) in 1957 represents one of the few examples of the operant approach appearing in the scientific literature. In this instance, the author utilized spanking, administered contingent upon aggressive behavior, in an attempt to control that behavior. The investigator also attempted to arrange desirable behavioral alternatives to aggression. The spanking was carried out by the child's parent. Although the behavior was brought under control, it was unclear that punishment was the decisive variable.

Recently, there has been increased interest in the possible use of punishment with children (18, 6, 19, 20). Risley presented a case of a six-year-old child with the diagnosis of autism where one of the major behavioral problems centered on climbing into high places, which could have injured the child. Various experimental manipulations suggested that the behavior was intrinsically reinforcing. For example, it did not seem to be maintained by the parents' concern for its presence or absence. Mild but painful electric shock<sup>||</sup> was delivered contingent upon the recurrence of self-destruction, and the rate of the dangerous behavior was reduced to zero. Even though the experimenter administered the punishment, he apparently did not become aversive, at least as measured by the increase and persistence of eye-to-face contact the child made with him subsequent to the procedure. Perhaps this came about because the experimenter also fed and otherwise cared for the child. Risley also established a negative secondary reinforcer of sitting in a

<sup>||</sup> 300 to 400 volts at very low amperage.

particular chair and was able to use that event as punishment, thus reducing the use of shock.

The study by Lovaas, Schaeffer, and Simmons (20) involved the use of aversive stimuli in the form of an electrified floor grid to manipulate various behaviors in a pair of five-year-old autistic twins. The results of this study were fairly clear-cut and can be summarized as follows: first, stereotyped behavior (autoeroticism) could be suppressed by the application of painful stimuli contingent upon the appearance of the behavior. Secondly, the children developed a specific kind of relationship to those people who manipulated the pain (that is, presented pain contingent upon undesirable behavior and withdrew it contingent upon acceptable conduct). This relationship could best be described as affectionate. The children would hug and smile while sitting in the safe haven of the adult's lap. This type of response on the part of a child was maintained for considerable periods of time with minimal shock application. It also generalized from the laboratory setting and the experimental staff to the children's ward and the nursing staff. It was demonstrated in the study that such words as "no" acquired punishment properties when paired with painful stimuli, which allowed the adults to delete shock in much subsequent work with the children.

On the basis of similar evidence from animal work and the Lovaas and Risley studies, painful stimuli have been used in experimental treatment of nine children at the Neuropsychiatric Institute, UCLA, and it is judged useful to summarize and discuss these findings and their implications for treatment.

#### SUBJECTS

The group of nine children used in these studies consisted of eight boys and one girl between the ages of four and ten. All of these children had been diagnosed as childhood schizophrenics in the broad sense defined by Blau (21), Goldfarb (22), or Menolascino (23). The children were characterized behaviorally by (1) abnormalities in speech manifested by mutism or echolalia; (2) failure to develop the usual social behaviors such as habit patterns (toilet training, table manners, and so forth) and the social amenities; (3) failure to develop appropriate play; (4) the presence of repetitive stereotyped bodily movements; (5) failure to develop social responsiveness, and (6) abnormalities of attention frequently manifested by absence of startle response, peculiarities in orienting and habituation to external events (24), and at times the reverse, with intense preoccupation with a limited source of certain external events, such as staring at a light or listening to a ventilation duct. Historically, the children showed a somewhat diverse picture, but generally, indicators of the disorder developed within the first year of life.

For the most part, the decision to use painful stimuli was made when (1) it was found that the child consistently failed to attend cues from his environment, namely, consistently "drifted," was grossly inattentive during

school-like training offered him, or (2) showed a high incidence of repetitive stereotyped movements which interfered with the establishment of other behaviors, and (3) if he engaged in self-destructive behavior to the extent of endangering his own health. Even with these characteristics present, more evidence was required before the decision to use shock was made. Specifically, (a) the judgment that extinction procedures would be too protracted and thus harmful to the patient; (b) the child remained unresponsive after three to four months of treatment (not using shock), and (c) extensive staff discussion of the problem. When the decision was finally made to utilize this approach, it was discussed with the parents, and their written consent was obtained to carry out the program.

#### APPLICATION OF PAINFUL STIMULI

The aversive stimuli utilized in our laboratory can be ranked in degree of aversion from a loud "no" to a slap on the hand or bottom, to mild but painful electric shock. The child's responsivity to any of these stimuli determined the level employed, that is, we did not employ electric shock if a slap would suffice.

The electric stimulus was delivered in one of three ways: (1) an electrified grid was placed on the floor of the lab consisting of an adhesive tape coated on one surface with a conducting substance. The grid was connected to an electric source consisting of a six-volt battery and a Harvard inductorium. The child was placed in the room with his shoes and socks off. The painful stimulus was delivered for a brief period of time through the feet, and it was impossible for the child to tell who delivered the stimulus; (2) a remote control device, the Lee Lectronic Trainer<sup>¶</sup> which delivered a signal from a hand-held device to a cigarette-sized receiver taped to the child's waist. The shock was delivered to the buttocks through two copper electrodes fastened there. Again, the electric stimulus (which was of the same order of magnitude as the "shock stick") was brief and the child did not know who was delivering the stimulus; (3) the so-called "shock stick" was the most useful device. It is commercially available and is a battery powered instrument in which a painful shock could be delivered by touching two electrodes at the top of the stick to the child's leg. In contrast to the other two methods of delivery, it was clearly apparent to the child who was delivering the painful application.

Slapping the child was carried out by striking him either on the buttocks or the extremities. It is not too difficult to see that this popular social technique was fraught with difficulties. These included quantification of the stimulus and physical injury to the child.

All of the above stimuli can be called primary reinforcers, and as such, are used sparingly. Whenever they are used, they are coupled with a number of verbal and nonverbal actions on the part of the attending adult. These

<sup>¶</sup> Lee Supply Company, Tucson, Ariz.

actions include verbal admonitions such as "no," "don't do that," "stop that," and nonverbal gestures such as a stern visage or a threatening move. By association, these actions take on some of the aversive characteristics of the primary stimuli and become established as secondary negative (punishing) reinforcers. The obvious result is that there can be a reduction in the use of primary aversive stimuli and increased reliance on more common social behavioral controls such as disapproval.

#### FOUR CLINICAL CASES

In order to best exemplify the clinical usefulness of punishment, a description of four situations will be undertaken. The first relates to the study by Lovaas, Schaeffer, and Simmons (20), involving a pair of five-year-old autistic twins. The main characteristics of these twins were aloofness toward any other human being, failure to respond to social direction of any sort, and a high percentage of time engaging in repetitive stereotyped motor behavior. Electric shock was used to intervene in each of these areas, but the one to be focused upon here is the alteration of the aloofness directed toward human beings. Initially, the children were placed in the laboratory with two adults who asked them to "come here"—gesturing with outstretched arms. There was no observable response. Shock was applied and remained on until the child went to one or the other adult, thus establishing escape from shock. The child was physically prompted to approach the adult if he failed to engage in the escape behavior. The child learned rather quickly to avoid the shock altogether by approaching the attending adult. Once these behaviors were learned, they were very durable, lasting almost a year. When the responses extinguished, they could be reinstated with a single shock. Since pain was reduced by the child's approach to the adults, it was reasoned that the adult would be discriminate for pain reduction and, thus, take on positive reinforcing characteristics. This was clearly demonstrated in the resistance to extinction of a new response to receive a view of the experimenter's face.

The response to human beings developed in the laboratory generalized to the nonlaboratory situation and has been maintained in part for a three-year period. Currently, one of the twins remains in the hospital and, at the age of nine, shows positive affectionate responses to adults in his environment which appear to be a continuation of the behaviors established in the original experimental situation.

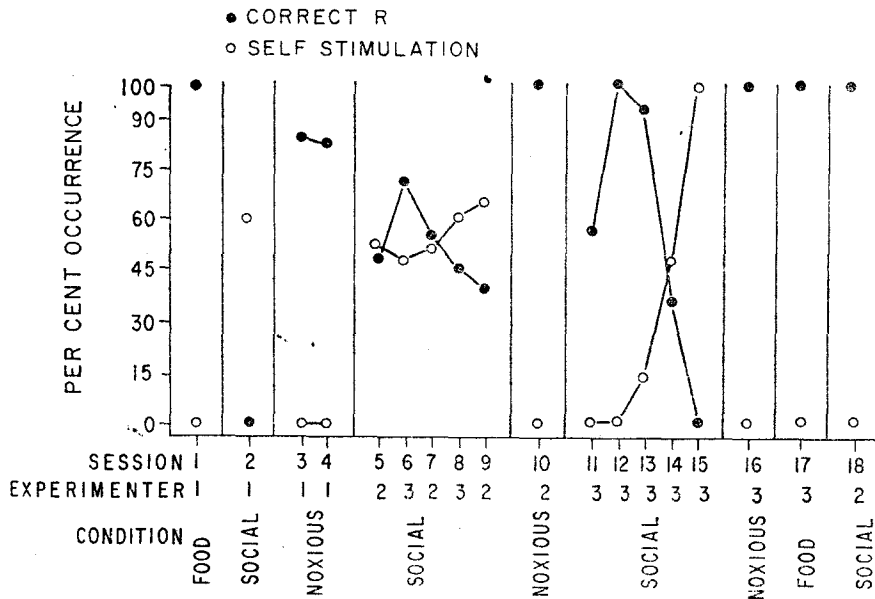
The second clinical situation involved a nine-year-old girl, Pamela, one of identical twins, with a history of delayed motor development, poor socialization, and a high incidence of self-stimulatory behavior. Within the first two years she developed bizarre repetitive movements, hyperactivity, and temper tantrums. Speech development was delayed and when it was established, consisted mainly of echolalia. The child was treated fairly intensively over a six-year period both as an outpatient and on an inpatient basis with little modification of the total picture. She was seen in our research program for approximately 15 months, during which time it became obvious that the repetitive stereotyped movements which she displayed for considerable periods of time were interfering with attempts to gain her attention and alter her general behavior pattern. Initially, her attention and task

performance could be maintained using primary reinforcers such as food, but she would not respond to social reinforcement. Instead, she spent quite lengthy periods of time staring into space, flapping her hands in front of her eyes, grimacing, and laughing. Apparently, these behaviors were more reinforcing than the social rewards, and, consequently, it was decided to apply a painful stimulus to suppress this type of behavior and permit the establishment of potentially more useful behaviors maintained by social reinforcement.

In the training session, slaps and the word "no" were delivered contingent upon the appearance of unacceptable interfering behaviors. Within a brief period of time these behaviors diminished in number and could soon be suppressed using

FIGURE 1

Per cent occurrence of correct responses versus self-stimulatory behaviors in Pamela, comparing food reinforcement with social reinforcement, both before and after shock.



the words "no" and "stop that," without the physical intervention. As soon as these behaviors were under control, the child was directed to an activity such as identification of colors or naming of objects, which she was able to perform and for which she would be generously rewarded with praise. In this situation, the defined acceptable behaviors increased to an expected criterion and interfering behaviors diminished to zero (Figure 1). The original regressive behaviors were recaptured if a person associated only with positive reinforcement was trying to work with her; the repetitive behaviors returned and the socially useful behaviors again dropped out. Despite the fact that certain behaviors were modified and maintained over a period of time, the over-all picture remained unchanged. The

stereotyped behaviors frequently returned, suggesting that they were intrinsically reinforcing and could only be suppressed with considerable effort.

The third clinical situation could be best epitomized by the case of a four-year-old boy, Stanley, with a history of delayed development in many areas. Within the first year it was noted that he failed to respond to his parents and indulged in considerable rocking. During the second year he showed toe walking, arm flapping, and intense preoccupation with certain objects such as screws and bolts. He failed to respond to attention from adults and never smiled. He had not developed speech at the time of admission at age four. He presented himself as an aloof child showing no response to strangers or to separation. He permitted little physical contact, exhibited no eye contact, and no vocalization except whining. He was placed in a training program designed to establish speech and social behaviors using a positive reinforcement approach. Although it was possible to establish some basic sounds and play behaviors, it was extremely difficult to hold his attention. He would constantly "drift" or start whining. To strengthen the positive reinforcing quality of food, he was deprived of food by skipping his breakfast that day or dinner the night before. However, this had no major effect on the "drifting" or whining.

In an effort to suppress these behaviors, he was slapped contingent upon the whining and inattention. After a two-month period of using only occasional slapping, the situation was essentially unchanged. At this point, the use of the shock stick was introduced with the same contingencies as with the slapping. The result was a diminution in the index behaviors, but the child showed marked aversion to the experimenters for several days. After this initial period, he developed an extremely affectionate response to the experimenters, permitting physical contact, eye contact, and exhibiting considerable smiling and hugging in their presence. He continued to show marked aversion to the sight of the shock stick, which had to be removed and replaced with a remote control device.

In general, his repertoire of social and speech behaviors increased more rapidly following the electric shock. Two months after the beginning of the electric shock, he still showed a tendency to drift on occasion, but it might have been that it was not clear to him what alternative behavior was expected. However, he remained affectionate and cheerful, a phenomenon which was also apparent in his interaction with other members of the staff and with his family. Two months after electric shock was completely discontinued, the child continued to show the positive behaviors toward others and a reduction in unacceptable behaviors when admonished with "no" or "stop that."

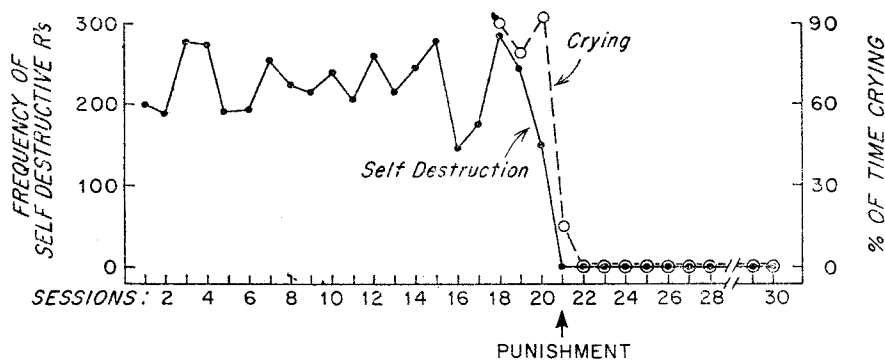
The fourth clinical situation is that of a seven-year-old boy, John, one of fraternal twins, transferred from a hospital for the retarded. The history was one of delayed social development, initially noted when he was one-and-a-half years of age. At the age of two, he started hitting his face and head with his hands, resulting in bruising. He failed to develop speech and other social behaviors. Because of the continual self-abusive behavior he was hospitalized. During the year of hospitalization he continued to show self-injurious behavior which could not be modified by isolation, deprivation, or constant attention and, thus, he required almost



continual restraint. After transfer to the Neuropsychiatric Institute, the child was removed from restraints and observed in order to establish a base rate of self-hitting. While isolated in a bare room, the rate decreased slightly. However, because of the possibility of serious injury during prolonged extinction it was felt that isolation and simple nonreinforcement was not an appropriate alternative. An effort was made to suppress the self-hitting by establishing competing behaviors such as feeding, which when performed would not permit the motor activity of hitting, but the rate of hitting remained unchanged. Therefore, it was decided to use negative reinforcement in the form of painful stimuli contingent upon the self-hitting behavior. The painful stimuli included both slapping and electric stimuli. Each acted to reduce the self-hitting behavior to zero within a period of eight days. This reduction in hitting was maintained in a variety of situations outside the laboratory for several weeks (Figure 2). The child has been returned to

FIGURE 2

Baseline frequency of John's self-destructive behavior and the response to contingent shock. Note the parallel decrease in crying behavior.



the State Hospital where it has been possible to maintain the suppression of self-hitting if the conditions under which it was suppressed are maintained.

DISCUSSION

Any general consideration of punishment should be prefaced by a brief discussion of evidence cited against its use. Perhaps the outstanding criticism is a moral and humanitarian one which is of great moment. However, Church (7) dismissed this in his comment that "whenever the alternative to punishment involved deprivation or extinction, the relative moral values are difficult to assess." A second criticism centers on the general idea that punishment does no good. This contention frequently arises out of experience with the use of punishment in general to deter certain behaviors, such as criminal behavior or insanity. Examination of these social conditions reveals that punishment which has been utilized to manage the abnormal behavior was probably given on a noncontingent basis for such global activity as being

"crazy" or being "bad." In this type of situation the chances of gaining an expected outcome are minimal, since cardinal principles of behavior modification are completely ignored. These principles are basically that (a) the punishment was probably not given contingent upon a clearly specified behavior; (b) the time relationship between behavior and punishment was probably of long and variable length, making the relationships between the two quite uncertain, and (c) it may have been that no clear-cut escape behaviors within the functional capacity of the individual were offered.

Experimental findings on paradoxical effects of punishment in facilitating an index response have often been invoked as good reasons for not using it. Church (7) has delineated a series of four hypotheses under which punishment may facilitate the appearance of a punished response. The first was the discrimination hypothesis in which the negative reinforcement reinstated a condition of training for that particular response, namely, the situation in which punishment followed a given response was similar to the situation in which positive reinforcement was used. Therefore, it could be postulated that the likelihood of a clear-cut discrimination would be decreased. The second hypothesis concerned the fear response, in which fear itself, with whatever concomitants existed, simply facilitated the punished response. The competing response hypothesis was established to account for those instances where a skeletal response to the painful stimulus was similar to the punished response. Lastly, the escape hypothesis was postulated in which the punished response was similar to the response occurring at the time of termination of the painful stimulus.

In the third clinical situation of the series described above, a punished response (whining and fussing) was increased merely by the sight of the instrument used, and also initially by the sight of the individuals who had utilized it. This probably represented an instance where a fear response was the same as the punished response. However, despite these objections it seems apparent that if the contingencies are clear concerning which behaviors will result in punishment, and if the escape responses are unique and within the performance capabilities of the individuals, no response facilitation should take place.

On the basis of information derived from our experimental work, several possible uses of punishment seem worthy of comment. Perhaps the most interesting possibility is the use of punishment developing out of the effects in the first clinical situation. This involves a person taking on secondary positive reinforcing qualities by being associated with pain reduction. The situation in which a child is placed in a noxious environment modified only by the appearance or endeavors of a particular person offers something perhaps analogous to one aspect of the role of a mother in normal infant rearing. In the particular patient group we are dealing with, one of the most charac-

teristic problems relates to the failure to develop positive relationships with the parents and other people. Irrespective of the particular theoretical view one might hold (behavioral, dynamic, biologic), it is possible to conclude that this particular technique might be useful.

From the strictly behavioral point of view, Lovaas, Schaeffer, and Simons (20) demonstrated that the adults did acquire reinforcing properties. From a dynamic point of view, it could be reasoned that these children have experienced abnormal transactions between themselves and significant others during infancy. Consequently, the introduction of threatening situations which can be altered, diminished, or alleviated by people could be rationalized as a recreation of one aspect of a much earlier human condition, and, thus, by repeatedly rescuing the child, that person would become significant to him.

When considering punishment, it is essential to focus on the significance of escape or avoidance behaviors. Punishment is more effective if the individual is provided an alternative as opposed to the situation where suppression alone is being attempted. This is particularly apparent if the behavior being punished is one which is intrinsically reinforcing. This was clear from Risley's study (18) and could also account for the difficulty we have encountered in the children described in the first two clinical situations. In both instances an effort was made to suppress stereotyped repetitive behaviors. Although these could be suppressed, they tended to reappear if punishment was discontinued. Consequently, the children were taught incompatible behaviors, such as ball play, for which they were positively rewarded and which could be substituted for the punished response. Even in instances where the punished behavior was not necessarily intrinsically reinforcing, it was also more effective to offer an alternative which was positively reinforced. This alternative could explain why in the third clinical situation the child overcame an initial aversive response both to the shock and to the attending adult, and was able to develop positive affectionate behaviors which were subsequently almost uniformly reinforced.

Perhaps the most clear-cut situation in which punishment can be used is the fourth clinical example. For anyone who has worked with a self-destructive, retarded, or schizophrenic child who requires periodic or almost constant restraint, the use of pain to suppress this behavior appears justified. Although it is possible that the self-injurious behavior is an operant which can be extinguished through the removal of reinforcers, it takes a strong will to endure the results of the first few moments or longer of the extinction period during which the rate goes up. This is particularly difficult if a hematoma appears or actual tissue destruction takes place. It is in these specific situations that the care-taking personnel rescue the child and reward the behavior, thus insuring its continued presence. In view of the results in the fourth case, it is clear that punishment offers an acceptable alternative.

It is necessary to keep in mind that punishment is utilized purely to restrict certain unacceptable behaviors, but not to suppress behavior in general. To avoid the latter, the application of pain must have certain limitations in intensity and total usage, and the concurrent positive reinforcement of acceptable behaviors must be maintained. The intensity of pain must be titrated to where it is bothersome, but not overwhelming. The total usage must be limited both by the reinforcement ratio which is reduced as soon as possible, and also by pairing painful stimuli with the usual words used in this general context to modify behavior. These could include "no," "stop that," and so on, which have been shown to take on significant secondary reinforcing powers in this type of situation, thus decreasing the need for shock.

Careful attention must be paid to the comment about restricting behavior. In all of the clinical situations, the major focus was on the reduction of unacceptable behaviors utilizing pain. The establishment of new behaviors in almost all instances was carried out by using a positive reinforcement approach once attention could be gained. The building of a social type of behavior in the escape or avoidance situation is the only situation where a new behavior was established utilizing punishment.

Some evidence from our laboratory suggests that where attempts were made to teach a child new speech or social behaviors with negative reinforcement for nonperformance, the over-all function of the child deteriorated.

Finally, the use of pain is extremely unsettling to the personnel involved in the procedures. One must always carefully avoid the use of punishment because of irritation with the performance of the child or out of some other personal motive wherein the contingencies, for the child, become less clear. Obviously, the use of techniques such as this by care-taking personnel are contrary to the basic concepts of care-taking and, thus, make it impossible for some people to utilize it, since it presents a considerable conflict. This conflict alone, however, should not be the determining factor in whether pain is or is not used; rather, one should rely on the experimental evidence which shows the uses and limitations of the technique.

#### SUMMARY AND CONCLUSIONS

Painful stimuli were used in behavioral control with nine children diagnosed as suffering from childhood schizophrenia and moderately severe retardation. Indications for use of this technique were: (1) failure of the child to attend and respond to cues from his environment; (2) the presence of repetitive stereotyped behaviors which have interfered with learning; and (3) self-destructive behavior which presents a significant problem. Four clinical situations were presented to illustrate these principles. 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.

Evidence was reviewed relating to actual experimental results following the use of negative reinforcement which might prove useful. These include: (1) Punishment tends to alter behavior by suppressing responsiveness. (2) If it is given on a contingent basis, the suppression is more specific. (3) In a two-choice situation, the punishment for a wrong response facilitates learning the correct response; and (4) There is an inverse relationship between response strength and the interval between response and punishment.

In clinical situations, punishment seems to have possible application. The applications which seem most apparent at this time are: (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.

#### REFERENCES

1. Ferster, C. B. Positive Reinforcement and Behavioral Deficits of Autistic Children. *Child Develop.*, 32:437, 1961.
2. DeMeyer, M. K. and Ferster, C. B. Teaching New Social Behavior to Schizophrenic Children. *J. Am. Acad. Child Psychiat.*, 1:443, 1962.
3. Weiland, I. H. and Rudnik, R. Consideration of the Development and Treatment of Autistic Childhood Psychosis. *Psychoanal. Study of the Child*, 16:549, 1961.
4. Lovaas, O. I., Freitag, G., Kinder, M. I., Rubenstein, B. D., Schaeffer, B., and Simmons, J. Q. Establishment of Social Reinforcers in Two Schizophrenic Children on the Basis of Food. *J. Exp. Child Psychol.*, 4:109, 1966.
5. Lovaas, O. I., Berberich, J. P., Perloff, B. F., and Schaeffer, B. Acquisition of Imitative Speech by Schizophrenic Children. *Science*, 151:705, 1966.
6. Lovaas, O. I. A Behavior Theory Approach to the Treatment of Childhood Schizophrenia. University of Minnesota Press, Minneapolis, 1967.
7. Church, R. M. The Varied Effects of Punishment on Behavior. *Psychol. Rev.*, 70:369, 1963.
8. Bandura, A. Punishment Revisited. *J. Consult. Psychol.*, 26:297, 1962.
9. Szasz, T. *Pain and Pleasure*. Basic Books, New York, 1957.
10. Freud, S. *Beyond the Pleasure Principle*. Liveright, New York, 1950.
11. Solomon, R. L. Punishment. *Am. Psychol.*, 19:239, 1964.
12. Azrin, N. H. and Holz, W. C. Punishment in Operant Behavior. In *Operant Behavior. Areas of Research and Application*. Honig, W. K., Ed. Appleton-Century-Crofts, New York, 1966.
13. Durant, W. *The History of Civilization. Our Oriental Heritage*. Simon & Schuster, New York, 1936.
14. Sears, R. R., Maccoby, E., and Levin, H. *Patterns of Child Rearing*. Row Peterson & Co., Evanston, Ill., 1957.
15. Sanderson, R. E., Campbell, D., and Laverty, S. D. An Investigation of a New Aversive Conditioning Treatment of Alcoholism. In *Conditioning Techniques in Clinical Practice and Research*. Franks, C. M., Ed. Springer Publ. Co., New York, 1964.
16. McGuire, R. J. and Vallance, M. Aversion Therapy by Electric Shock: A Simple Technique. In *Conditioning Techniques in Clinical Practice and Research*. Franks, C. M., Ed. Springer Publ. Co., New York, 1964.

17. Boardman, W. R. Rusty: A Brief Behavior Disorder. *J. Consult. Psychol.*, 26:293, 1962.
18. Risley, T. The Effects and "Side-Effects" of the Use of Punishment with an Autistic Child. *J. Appl. Behavior Anal.* (in press).
19. Lovaas, O. I., Freitag, G., Gold, V. J., and Kassarla, I. C. Experimental Studies in Childhood Schizophrenia: Analysis of Self-destructive Behavior. *J. Exp. Child Psychol.*, 2:67, 1965.
20. Lovaas, O. I., Schaeffer, B., and Simmons, J. Q. Experimental Studies in Childhood Schizophrenia: Building Social Behavior in Autistic Children by Use of Electric Shock. *J. Exp. Res. Pers.*, 1:99, 1965.
21. Blau, A. The Nature of Childhood Schizophrenia: A Dynamic Neuropsychiatric View. *J. Child Psychiat.*, 1:225, 1962.
22. Goldfarb, W. *Childhood Schizophrenia*. Harvard University Press, Cambridge, Mass., 1961.
23. Menolascino, F. J. Autistic Reactions in Early Childhood: Differential Diagnostic Considerations. *J. Child Psychol. Psychiat.*, 6:203, 1965.
24. Bernal, M. GSR Studies of Autistic Children. Presented at the annual meeting of the American Psychological Association, Chicago, Ill., 1965.