THE RELATIONSHIP BETWEEN FRUSTRATION AND SELF-INJURIOUS BEHAVIOR IN MENTAL RETARDATES

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PREFACE

The apparent neglect of the fact that intellectually subnormal individuals suffer from emotional disturbances and mental illness poses a problem for treatment-oriented institutions for the mentally retarded. Although psychiatry is showing an increasing interest in the emotional problems of mental retardates, the use of many of the antiquated treatment measures for behavioral deviations remains unchanged.

If we may judge from the available literature, the experimental study of emotional or behavioral problems found in mental retardates is unusual. Considerable research has been completed concerning the etiology of mental retardation, but very few experimental projects have been conducted to ascertain behavioral factors important in dealing with those retardates who present management problems. The lack of research concerning behavioral problems in mentally retarded individuals may be more than indirectly related to the almost exclusive custodial nature of most institutions for the retarded.

The purpose of this study, in addition to discovering factors involved in self-injury, was to explore a method of investigating behavioral problems found among mental retardates. Because the majority of the retarded are classified as idiots and imbeciles, the number of available experimental situations which can be used with these patients is limited. For the present experiment, several experimental situations were attempted or considered before a method was found that could at least be used with imbeciles.

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I. INTRODUCTION

This study is concerned with the many patients among institutionalized populations of mentally retarded who exhibit behavior which is characterized by what appears to be aggression directed toward themselves. These patients appear to hurt themselves by banging their heads against the floor or wall, biting their hands and arms, slapping their faces, or scratching themselves on various portions of the body. If a cause of this behavior, either immediate or primary, could be determined, then the application of proper therapeutic procedures could reduce the incidence of self-injury and help the patients make a more satisfactory adjustment to their situation. Since the severely retarded often cause abrasions and lacerations requiring medical attention, the need for effective treatment is especially urgent. However, without experimental evidence concerning the cause of this behavior, it is difficult to achieve any degree of successful treatment by concentration upon the overt manifestations, which appear to be only symptomatic.

Review of Literature

Characteristics of Self-injurious Mental Retardates

To turn to some of the characteristics of these patients who exhibit self-injurious behavior, Butterworth and Bower (1959) report that among the feeble-minded patients at Pennhurst State School, Spring City, Pennsylvania, approximately two per cent indulge in hand-biting self-injurious behavior alone. From observation at Winfield State Hospital

and Training Center, Winfield, Kansas, there appears to be a roughly similar proportion of these individuals who show each of the other forms of self-injurious behavior mentioned as well as an additional similar proportion who show combinations of these behaviors. The more severe forms of self-injury are found among the severely mentally retarded patients, i.e., idiots and imbeciles. Patients with moron level of intelligence also show some of this behavior but in a much milder degree in intensity and frequency. There seems to be no sex difference at any level.

In a recent report, Butterworth and Bower (1959) describe the physical results of self-biting among severely retarded patients. They report that patients who indulge in self-biting usually make a habit of biting the same area, most often the forearms, hands, fingers in that order. The traumatized area of the skin becomes thickened, dry, hyperkeratotic, and frequently pigmented. They report that intermittent pressure and friction by the chewing motion are responsible for the changes produced. These changes are distinctive and persist indefinitely under the stimulus of often repeated injury.

A recent investigation (James, 1959) comparing secondary habit disorders in normal children and adult mental defectives notes that there was a qualitative difference between the normal child and retarded child in that tension habits were much more pronounced in the mental defective. Retardates were reported much more difficult to interest in any other activity while indulging in self-hitting to the extent that many times significant facial damage resulted. The author's conclusions were that, since these habit disorders in defectives persist into their declining years, it seems probable that such self-

injury is related to the general level of emotional development rather than to physiological maturation of any part of the central nervous system.

Treatment of Self-injurious Mental Retardates

In attempting to control and treat the patient who exhibits self-injurious behavior, institutions have used physical restraints, sedation, tranquilization, and attitude therapy. However, the results of these measures have neither been satisfactory nor enlightening. Apparently physical restraints control the behavior only temporarily and, in addition, subject the patient to other injurious activity that may result from the restraining devices. Gelatin and even plaster casts are removed by the patients in a matter of hours (Butterworth and Bower, 1959). Sedation alleviates this behavior for a period of time but institutional custodial care requires that the patient be awake part of the day in order that his physical needs may be met.

The use of ataractics appears to be, from observation, 50 to 75 per cent effective when used with this type of patient. Sprague (1941), Lehmann and Hanrahan (1954), Bair and Herold (1955), P. E. Feldman (1957), and Schwartz (1957) report on the use of various ataractics in the control of hyperactivity and the inhibition of psychomotor excitement with the mental defective. These reports note control of self-injurious behavior in differing degrees. This inconsistency in the degree of control indicated by the various reports may be the result of what appears to be inadequate controls and unsubstantiated observations in many of the reports. These reports seem to focus concern on the effect of the various tranquilizing drugs which almost inciden-

tally have been used with various groups of mental retardates. In any event, these drugs have not seemed to be satisfactory in controlling this very abnormal form of behavior. Apparently the effect is only one of reducing the amount of activity for the given patient and consequently reducing the amount of self-injury. The use of ataractics is a treatment of symptoms rather than causes and does not take into account the environmental aspects that might be partial causes of the particular behavior.

Concerning attitude therapy, which in itself is a very difficult form of treatment to institute, the results are not clear because of the lack of methodological techniques for measuring these instances. Attitude therapy involves the use of the abilities of the various attendants who care for these patients and, because of vast personality differences and individual interests, it is difficult to teach the aide personnel the particular approach and method of dealing with the patients involved.

Theoretical Explanations of Self-injurious Behavior

Obviously, the problem of determining the cause or the factors that facilitate the evocation of self-injurious behavior becomes complicated. The behavior itself seems to be only symptomatic of some other disorder and, since this behavior occurs in the more severely retarded, the determination of factors related to the instigation of this behavior becomes extremely difficult. A review of the literature was carried out in an attempt to discover whether any psychological theories might explain self-injurious behavior. Some of the postulated views might offer assistance in better understanding the behavioral deviations involved,

as well as focusing attention upon those particular aspects of development that are pertinent to the existence of self-injurious behavior.

Central nervous system and self-injurious behavior. There has been an attempt to relate self-inflicted injury to central nervous system impairment. Since brain damage or some malformation of the central nervous system is characteristic of mental deficiency, it seems reasonable to suppose that some neural disturbance might be a factor in self-injurious behavior. Robinson and Pasewark (1951) relate that damage to the prefrontal lobes of the cortex removes the inhibiting power which these areas exercise over the regions of the entire brain and consequently the behavior of the brain-damaged individual is characteristically erratic, uncoordinated, uncontrolled, uninhibited, and socially unacceptable. These authors report that brain-damaged individuals will continue to keep themselves busy at a task to avoid sudden irritation and outside stimulation which they feel they would be unable to handle. Failure at keeping themselves busy apparently results in a response that is disproportionate to the instigating stimulus. And even though such responses do not meet the situation, they allow an escape from the circumstances with which the patients are unable to cope.

There are difficulties with the view that self-inflicted injury is the result of brain damage. The most severe case of self-injurious behavior observed by the author concerns a patient who has had repeated normal electroencephalograms. With the physical measures available, therefore, no direct relationship has been found between brain damage and self-injurious behavior. On the other hand, it is possible that electroencephalograms are not sensitive enough to measure defective

neural mechanisms which could lead to this type of behavior. Also, it may be that neural activity of the mentally retarded should be gauged by different standards.

Pain and self-injurious behavior. There may be some relationship between self-injurious behavior found in mental retardates and the presence or absence of pain. Tredgold (1951) believes that pain is experienced by feeble-minded children. They will complain of headache, toothache, or stomach-ache, but here, again, it is exceedingly doubtful whether they have the same appreciation of painful stimuli as has the normal child. Tredgold (1952) states that many feeble-minded persons will suffer the extraction of teeth or other operations of minor surgery with relatively little concern. From observation in imbeciles and, to an even greater extent, in idiots, the inability to feel pain is often a very marked characteristic. Many of these persons will knock themselves against the floor and wall, poke their fingers in their eyes, pull out their hair, teeth, or toenails, or injure themselves severely in many ways without showing the slightest indication that the process is painful.

Self-injurious behavior may produce something other than pain in the mental retardate. Tredgold (1952) cites a case in which a boy had such an incurable habit of sucking his finger that the bone had been completely denuded, but the practice seemed to afford him extreme pleasure rather than discomfort. Butterworth and Bower (1959) report that, while possibly painful, self-injurious behavior seems associated with some form of pleasure for the patient because they universally smile when surprised in the act. However, while they do not always react in a manner that would indicate the presence of pain, it may be that these

patients, functioning at a severe level of retardation, could actually be distorting the painful stimulation in such a fashion as to perceive it as pleasurable in a way similar to that of the masochist.

Freudian theory and self-injurious behavior. In many ways the self-injurious behavior described resembles what is referred to as masochism. The concept of masochism implies the existence of sexual pleasure through having pain inflicted upon oneself. Freudian theory explains masochism as the fusion of erotic instincts and destructive instincts turned against oneself with the aim of the latter being self-destruction (Mullahy, 1948). The destructive instinct, for Freud, is a derivative of the death instinct. Accordingly, a person fights with other people and behaves destructively because his death wish is blocked by the forces of the erotic instinct and other facets of the personality that counteract the death instinct. The erotic and death instincts and their derivatives may fuse together, neutralize each other, or replace one another (Hall and Lindzey, 1957).

The relative contributions of the death and erotic instincts determine the degree of masochism. Because masochistic behavior is the consequence of the death instinct, without a token influence from the erotic or life instinct, the result would be death. The intensity and severity of the masochistic behavior then would depend upon the relative presence or absence of the erotic instincts impeding or facilitating the operation of the death instinct.

If the death instinct symbolizes a return to the womb, the first impulse at birth would be a result of the death instinct or the "wish" to return to the womb. According to Freudian theory birth represents a separation of the organism from the warmth and security of the womb.

Using Freudian theory then, the death instinct would be stronger than the life instinct at birth. If the death instinct is stronger during the early life of organisms, one would expect a larger proportion of the masochistic behaviors to occur in the early years of development. Supporting this idea Menaker (1953), a psychoanalytically oriented author, states that masochistic injury originates in the oral level of infantile development, that it is the outcome of traumatic deprivation, and that it functions as a defense against experiencing this deprivation with its corresponding anxiety and aggression. It was further described as a means of perpetuating whatever bonds there were to the mother.

From the present author's observation of self-injurious mental retardates there seems to be some support for the Freudian position. According to Freud, if the erotic instinct is emphasized, the manifestations of the destructive instinct will diminish. If self-injury is considered to be a manifestation of the destructive instinct, we should be able to reduce the incidence of such behavior by focusing the self-injurious patient's attention on the environment, and encouraging the erotic instinct. This has been found in one of the severely retarded patients who exhibited a most severe combination of self-injurious habits. It was found in working with this patient that, as a result of getting him involved in outside activities, getting him to work with things, taking him places, and giving him the direct attention of the personnel, the self-injurious behavior diminished quite remarkably.

However, there are some difficulties encountered in attempting to explain self-injury with the theory of masochism. Zuk (1960) indicates that there seems to be a distinct difference between masochism and self-injury. He notes that the aggressive impulse in cases of self-injury

does not seem to be directed against self as in masochism but rather against some event, object, or person in his environment. Because the retardate has difficulty differentiating himself from the environment, according to Zuk (1960), self-injury reflects a striking out at the most immediate object, himself.

Anxiety and self-injurious behavior. There are a number of behavioral characteristics found in mental retardates that indicate anxiety. Rocking motions are found quite frequently among the most severely retarded patients as well as such activities as thumb sucking, continuous hand waving, and hyperactivity. Also, psychosomatic illnesses can be found in patients functioning intellectually at the idiot and imbecile level in the form of duodenal ulcers, arthritis, and the like. The possibility, therefore, that anxiety exists among the severely retarded, where the more extreme cases of self-injury occur, seems well established on an observational basis. Even without experimental evidence that anxiety is involved in self-injurious behavior, the intensity, severity, and frequency of this behavior seems hardly accountable if the principle of tension reduction is ignored.

The psychological theory that all behavior results in tension reduction would necessitate the presence of anxiety in self-injurious behavior. McClelland (1951) states that it has been reported that self-inflicted pain is an indication of a need for punishment, and aggression directed toward the self supposedly often terminates anxiety. The masochist may seek punishment to the point of self-inflicted injury as a result of anxiety-provoking guilt feelings. However, the self-inflicted injury resulting from a need for punishment appears different from the self-injury found among retardates. It seems that confusing and incom-

prehensible demands from the environment arouse anxiety in the mental retardate, which finds release by aggression directed toward the self.

Self-injury in mental retardates may be a release of anxiety instigated by situational circumstances. Jersild (1954) reports that children blame their anger-provoking difficulties on other people and external circumstances as well as themselves, but, being unable to aggress against others, they release tension and anxiety by directing aggression against themselves. He states that this turned-inward aggression observed in children takes the form of temper tantrums which occur most often after some wish or request has been denied. He mentioned that children may go to such extreme lengths in showing their anger as holding their breath, vomiting, or banging their heads against a hard surface. However, seldom does self-injurious behavior in average children reach the proportion or frequency noted among retardates. This comparison may indicate a far greater amount of anxiety in the self-injurious mental retardate.

The presence of a great amount of anxiety may account for the apparently compulsive nature of self-injurious behavior. The behavior of self-injurious mental retardates is characterized by repeated acts of self-injury which are inappropriate under the existing circumstances. Jersild (1954) states that there have been hints that a compulsive tendency to hurt oneself may be the result of anger directed against the self. However, the compulsive element noted in the average child seems much more sporadic than that of mental retardates who respond so frequently and intensely that medical attention is often required.

Displaced aggression and self-injurious behavior. Children, according to Bender (1956), seem to have difficulty with interpersonal re-

lationships, particularly with parental figures. Since the home is an atmosphere where power is the dominant factor, it is reasonable to assume that aggression underlies the entire behavioral pattern. In this situation, open expression of hostility is not tolerated and retaliation is impossible causing the child's aggressive impulses constantly to boomerang. This is probably best observed in the temper tantrum of the young child who, in attempting to release his hostility, sometimes injures himself. He beats his fist on the ground in a symbolic display of his feelings toward the adult (Bender, 1956). Self-injury, therefore, becomes a mode of aggression in the young child.

Using the aggression hypothesis also, Butterworth and Bower (1959) state that self-injury is a symbolic attack on the body of the mother because among mental retardates self-injurious behavior usually develops only after the patient has been separated from his family for some time. The removal of the retarded child from a relatively comfortable home environment to the routine, almost mechanical existence of a custodial institution symbolizes rejection to the retardate. The mental retardate, therefore, reacts to this rejection, symbolically rebelling against the mother who has deserted him, by inflicting injury upon himself.

There is some difficulty in understanding this theory regarding the origin of self-injury. For instance, Butterworth and Bower do not state specifically why the rebellion was directed against the mother except through the implication that the maternal figure is more important than others during the early stages of development and closely associated with the orality these self-injurious retardates exhibit in biting themselves. Another difficulty concerns the statement that the retardate develops self-injurious habits after institutionalization. There are

actually many occasions in which this behavior originates in the home.

Tactual stimulation and self-injurious behavior. An alternative explanation of the origin of self-injury may involve attempts to compensate for deprivation of tactual stimulation. Harlow (1958) has demonstrated that tactual stimulation appears to be more important to offspring during the early stages of development than any form of stimulus. Mental retardates may have been deprived of the usual fondling and caressing, or tactual stimulation, in childhood, and self-injury involves a most severe form of tactual stimulation. If tactual stimulation is this important, the aggressive responses directed toward the self may be attempts at compensating for tactual deprivation and later take on the form of a regressive phenomenon momentarily gratifying when confronted with an incomprehensible situation.

Conditioning and self-injurious behavior. There is a possibility that self-injury is acquired as a response to difficulties in interpersonal relationships. Lacking intelligence and other personality resources which enable a normal person to adjust to his environment, the retardate may develop undesirable personality reactions such as attention-getting behavior, uncontrolled emotionality, or aggressiveness in attempting to adjust to a threatening environment (Thorne and Andrews, 1949). These anxiety-laden children act out their conflicts and this acting out may result in accidental injury (Bender, 1956) followed by attention and affection. As a result, the child may form an association between the injury and the reward. In other words, the child is conditioned to hurt himself by the rewards which follow such activity.

Self-injury may be reinforced or encouraged by a reaction produced in the environment. When the retarded child is deprived of love and

parental acceptance, his emotional security is threatened and with the development of this insecurity the child struggles to get the affection back from the parents (Robinson and Pasewark, 1951). Because self-injurious behavior attracts concern and attentive care, it may become gratifying or anxiety-reducing in an abnormal and ambiguous situation. Also, these deviant responses may reflect the extent to which the child must go to gain the resultant attention and care.

Through learning, self-injury may decrease pain appreciation in mental retardates. For instance, Melzack and Scott (1957) showed that experience with pain in early life largely accounts for reactions to pain in later life. They showed that subjects who were able to adapt to pain in early life were relatively undisturbed by pain at a later age. In the retardates, therefore, self-injurious behavior acquired in childhood may persist throughout life without ordinary pain appreciation because they are conditioned to self-inflicted injury.

Frustration and self-injurious behavior. Some available literature and observations indicate that frustration is directly related to the occurrence of self-injurious behavior. Frustration is defined as the blocking of, or interference with, an on-going goal-directed activity. The frustration-aggression hypothesis formulated by a group of Yale investigators states that in a frustrating situation aggressive behavior is the typical response and, given aggressive behavior, a frustrating situation is the typical cause (Woodworth and Schlosberg, 1954). Using this explanation of the relationship between frustration and aggression would, at least in part, account for the behavior of individuals who exhibit self-injurious behavior. Here, the aggression that is directed toward the self in self-injury would be conceived of as a result of

some frustrating circumstances.

The most extensive work with frustration has been done by Maier, et al. (1943, 1952, 1955, 1956). Maier's (1956) concept of fixated behavior, a stereotyped, compulsive response, is very similar to self-injurious behavior. Maier (1956) regards fixation as a typical response to extended frustration. He states that frustration produces fixation and the appearance of fixation in an organism indicates that it has been frustrated. The concept of abnormal fixations was used to apply to experimental findings involving persistent maladaptive responses.

There are some basic difficulties in attempting to equate fixated behavior with self-injury in mental retardates. Besides being explained elsewhere as escape learning (Dollard and Miller, 1950), the fixated behavior produced in Maier's work is the result of a forced frustration situation where he is forced to respond with an action which is punished. In the mental retardate who exhibits self-injurious behavior there is no reason to assume that he is being forced to respond as he does. Therefore, the situation involved in the production of these two forms of behavior appears to be different.

When considering self-injury, it seems more helpful to consider frustration as interference with goal-seeking activities. Mowrer (1950) states that "the barrage of prohibitions and injunctions constituting socialization of the growing child in our culture is inevitably frustrating." He states that, although forbidden, the natural reactions to frustration are acts of outright defiance or an attack upon the frustrating person or persons. Considering the situation of the mental retardate, both in terms of his abilities, and the reaction of the environment to him, it is not surprising that such abnormal behavioral

reactions should occur. In other words, the lack of ability to solve emotional problems predisposes the mental retardate to abnormal and deviant responses when confronted with frustrating situations.

A consideration of the relationship between frustration and regression may offer some help in understanding self-injury. Regression refers to a primitivization of behavior, i.e., resorting to a less mature way of behaving which the individual has outgrown. Temporary regressions frequently occur in intense emotional situations with both adults and children. Barker, Dembo, and Lewin (1943) conducted a study in an attempt to create regression in children by frustration. Yielding positive results, the study showed that in frustration there is an aggressiveness, motor restlessness, and hypertension.

A recent article (Zuk, 1960) uses frustration and regression to explain self-injury. The report postulates that the aggressive impulse in self-injury is actually directed against an external frustrating agent. He states that self-injury is a result of a regression of the ego to an infantile level with the consequent breakdown of the identification of the ego with the body. Zuk (1960) states that there is no distinction between the self and the environment in the mental retardate and because of this the aggression is often not directed against the actual frustrating agent. The victim obviously has easy access to his own body, which frequently tends to be selected as the object of the aggression (Zuk, 1960). Therefore, self-injury would represent a distortion of the impulse to strike out at someone else.

Summary

There is little information available concerning institutionalized

mental retardates who exhibit self-injurious behavior such as head-banging, self-biting, self-hitting, and self-scratching. Self-injurious mental retardates are estimated to comprise 10 per cent of institutionalized mental retardates. In a study pertinent to self-injurious behavior, self-injury was concluded to be the result of emotional factors rather than central nervous system impairment. And the presence or absence of pain sensitivity seems to have no facilitating or inhibiting effect upon self-injurious behavior. No successful treatment measures have been found for the causes of self-injury, although ataractics have been shown to be partially effective in relieving the symptoms.

Self-injurious behavior resembles masochism but does not seem to be the same in terms of the direction or goal of the behaviors. Self-injury appears to be a reaction to external circumstances in attempting to adjust to the environment. A number of observations were noted indicating the presence of anxiety and emotional disturbance in the mental retardate. Aggression displaced toward the self was presumed to play an influential role in the behavior of children, giving rise to the possibility that self-injurious behavior may be learned as a result of frequent reinforcement of this behavior through the attention and care it attracts. Tactual sensory deprivation was suggested as a possibility in attempting to account for the regressive nature of self-injury because this very abnormal behavior may involve compensation for tactual stimulus deprivation. The direction of the aggression has been explained on the basis of the very poor self concept of the mental retardate. This theory suggests that the retardate does not differentiate himself from the environment and when confronted with frustrating circumstances strikes out at the nearest object, himself.

Although the original cause for self-injurious behavior has not been determined, the frustration-aggression hypothesis appears to be as fruitful as any in explaining this behavior. Frustrating behavior, in this case, is to be distinguished from the concept of fixation which implies a compulsory, punished response. Frustration resulting in self-injury appears to be the consequence of interference with on-going behavior, and the mental retardate, in attempting to adapt to a confusing or incomprehensible situation, apparently resorts to a maladaptive, stereotyped response, possibly involving regression. Even though frustration may not be the remote cause of self-injury, it may be related to the instigation and prolongation of this behavior.

Conclusions

This review indicated that self-injury seems to be the result of an emotional disturbance rather than any form of central nervous system impairment. There are a number of possible explanations of this form of apparent emotional disturbance but none of them seem adequate to explain the original instigation of this very abnormal response. Without adequate knowledge regarding the original instigating factors, formation of this behavior cannot be prevented. However, if the more immediate or precipitating factors that give rise to self-injurious responses could be determined, an effective treatment program might be devised. Even though displaced aggression and regression may be used to account for self-injury, frustration seems to be the most immediate factor involved in the evocation of self-injurious behavior.

II. STATEMENT OF PROBLEM

The purpose of this study is to test the hypothesis that frustration is the immediate precipitating cause of self-injurious responses in mental retardates. Since the original cause for this behavior is probably too remote to be discovered without a vast study, we will be concerned with this immediate precipitating factor. Confirmation of this hypothesis may suggest a more satisfactory and successful method of treatment.

Assuming frustration to be the precipitating factor in the evocation of self-injury, experimental induction of frustration should produce an increase in the frequency of self-injurious responses. If one is to study this possibility, a number of additional problems arise. There are few reports of objective behavioral measures applied to mental retardates or of experimental conditions that are simple enough to use with the mentally deficient. For this reason a pilot study was conducted to determine whether mental retardates could respond to the proposed experimental conditions and to what extent the various intellectual levels could participate.

In the pilot study it was found that although retardates below a mental age of two years exhibit self-injury most frequently and intensely, it was found that they were unable to respond to the experimental situation because of extreme distractibility and inability to understand very simple instructions. These patients exhibited frequent self-injurious responses even when without frustration in the experimental situa-

tion. Patients above a mental age of two years were found capable of responding to the experimental conditions and those with a history of self-injury exhibited self-injurious responses when confronted with frustrating conditions. The patients at the imbecile level were also found capable of acquiring simple instrumental conditioned responses. Accordingly, the outcome of this pilot study indicated that the hypothesized precipitating factor in self-injury could be tested experimentally with patients at the imbecile intellectual level.

The design of the major experiment was developed to provide a situation in which the effect of frustration could be tested. Also of concern in investigating self-injury was the effectiveness of ataractic medication under frustrating conditions. Using a simple learning task to establish a reward situation, frustration was assumed to be induced by the withdrawal of reward for previously rewarded responses.

The following null hypotheses were formed:

1. that non-reward in a reward situation will cause no change in the frequency of self-injury in mental retardates whose behavior in the past has been characterized by self-injury.
2. that the use of ataractics will cause no change in the frequency of self-injurious responses of mental retardates when they are confronted with non-reward in a situation which previously resulted in reward.
3. that non-reward in a reward situation will cause no change in activity level of mental retardates whose behavior in the past has been characterized by self-injury.

III. EXPERIMENTAL PROCEDURE

General Methodology

The general procedure was to study the incidence of self-injurious behavior with and without ataractic medication when the subjects were rewarded (non-frustrated) and not rewarded (frustrated) for behavior which had been previously rewarded.

Three groups of mental retardates acquired a conditioned response to a Skinneroid experimental situation. Subsequently, the groups were assigned randomly to the experimental conditions of the study. A non-drug group and a drug group were assigned to a non-reward situation and a non-drug group was assigned to a reward situation.

Subjects

The 30 subjects used in this study were male and female patients of the Winfield State Hospital and Training Center, Winfield, Kansas. The subjects were selected on the basis of aide reports of frequent self-injurious behavior. The subjects were matched by threes as closely as possible in terms of age, sex, intelligence, living area, and ataractic medication. Because there are so many differences among the patients in this population it was difficult to match any 3 individuals satisfactorily. Therefore, the members of each set of loosely matched threes were separated into 3 groups and matching was considered on a group basis. The outcome of matching by groups can be found in the chapter of this

paper entitled "RESULTS." Upon division into 3 groups of 10 subjects each, the groups were assigned at random to conditions that are signified by the names: Experimental Group, Control Group, and Drug Group.

Apparatus

The apparatus (Figs. 1 and 2) consisted of two 4' x 6' panels of plywood painted white and hinged together to form two sides of a square enclosure in the corner of the experimental room. A one-way observation mirror was located in the wall of the experimental room allowing observation of activity inside the square enclosure of the experimental situation. Inside the enclosure, attached to one of the white painted panels called the instrument panel, was a 2' black horizontal lever on twin supports of 1" x 3/4" lumber projecting 12" from and perpendicular to the panel. Located 18" above the lever were two round red plastic discs 4" in diameter placed 12" apart horizontally and equidistant from the sides of the panel. Approximately 2" from the bottom of the panel and in the center, a 3" x 6" x 3" metal bread pan protruded 3" from the panel and slanted downward at a 45 degree angle. At the top of the panel, a 1/2' x 4' section of plywood, also painted white, projected upward at a 45 degree angle from the panel. In the center of this projection a viewing panel, an 8" x 12" diamond cutout, was located and covered with one-way vision plastic behind screen wire. The adjacent panel of plywood was unmarked and could be swung out for use as a door to allow the subject to enter and then have it closed behind him.

The rear of the instrument panel consisted of the one-way vision plastic window in the viewing panel above and overlooking the experimental situation. An electric counter was attached to the viewing panel

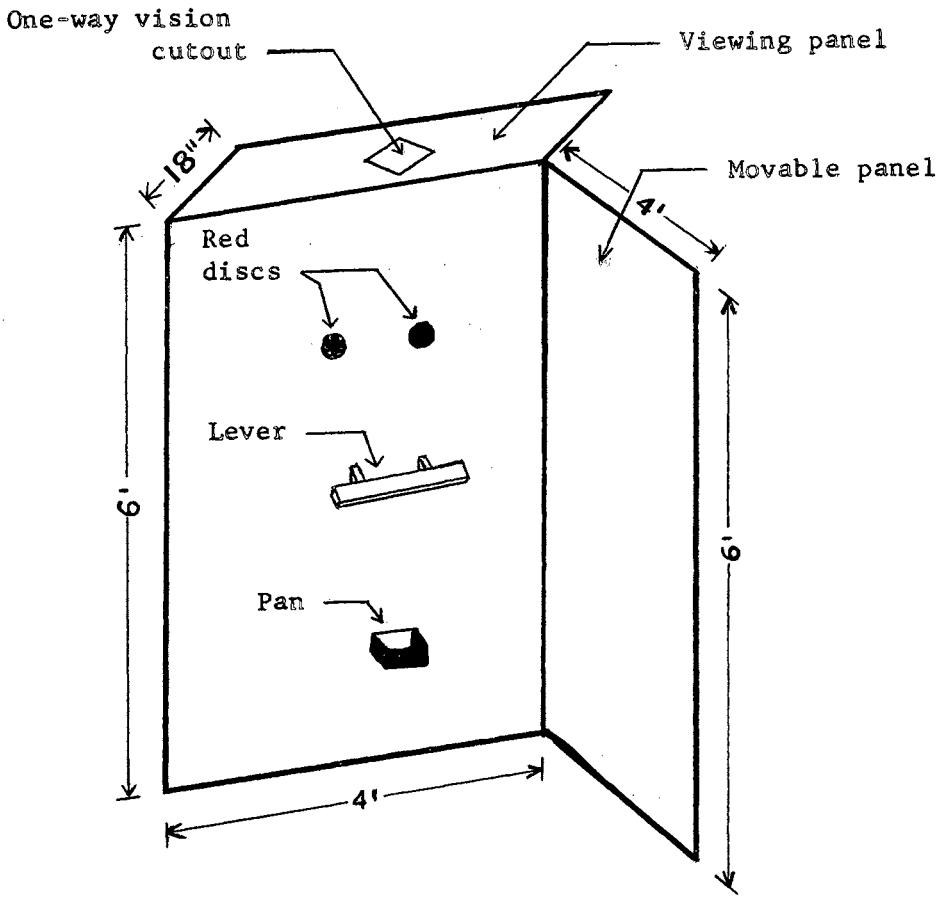

Fig. 1. Diagram of the front of the apparatus

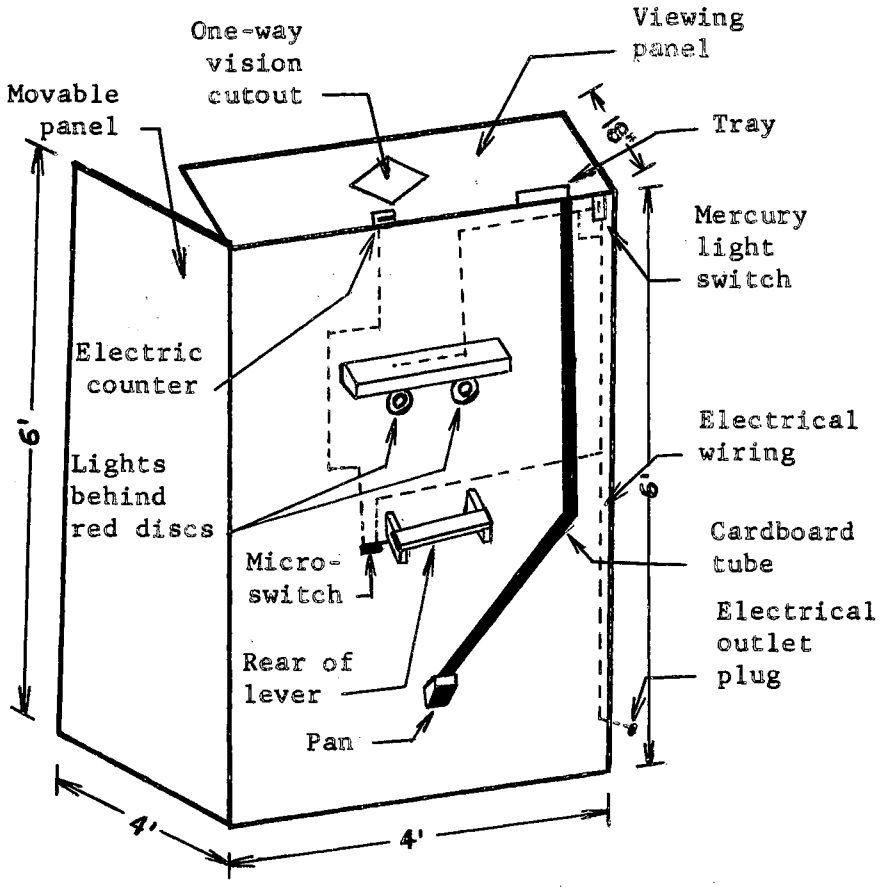

Fig. 2. Diagram of the rear of the apparatus

and connected to a micro-switch that was placed on the lever at the back of the panel to count the number of lever-pressings. There were two 25 watt light bulbs behind the red plastic discs, controlled by a mercury switch also attached to a viewing panel for manual operation by the experimenter. A 5' cardboard tube, 1 1/2" in diameter, was also attached to the viewing panel and led to the pan at the lower part of the instrument panel. Candy (M & M milk chocolates) could then be dispensed manually from the viewing panel. The portion of the lever that protruded 12" from the back of the panel was used to lock the lever in place by applying pressure downward.

Procedure

The ataractic medication of all subjects with the exception of the Drug Group was discontinued seven days prior to being introduced into the experimental situation. The first session, or conditioning session, was the same for all groups. The subjects were brought into the experimental setting individually and told:

> "If you press the lever when the red lights are on, a piece of candy will drop into this pan." (Demonstrated by the experimenter.) "You may eat the candy when you get it or put it in this sack (provided by the experimenter) and take it with you when you leave."

The experimenter then demonstrated two trials, placing the candy in the subject's sack. The subject was then given three trials in the experimenter's presence. Following this the experimenter left the experimental room and the trials began.

One trial consisted of a 5-second period during which the red lights were on. The lever could be pressed and the candy received while the red lights were on. A subject could receive only one piece of candy

each time the red lights were on, no matter how many times he pressed the lever. There was a 10-second between-trial interval following the 5 seconds that the lights were on, during which the lever was locked in place, making the duration of one complete trial 15 seconds. The subjects were given these 15-second trials in sequence until they reached the criterion of ten consecutive rewarded trials. The achievement of this criterion concluded the conditioning phase.

The experimental session was introduced on the following day for all subjects. The initial portion of this session consisted of further training trials and was the same for all groups. The subjects were brought into the experimental setting and told:

"We are going to do the same thing we did yesterday."

The experimenter left and the trials were started in the same fashion as on the previous day. These were continued until the subject achieved five consecutive rewarded trials. Then, automatically, the experimental conditions were introduced for the respective groups.

This portion of the experimental session, the experimental phase, consisted of 40 successive trials. Each complete trial period consisted of 20 seconds. During the initial 5 seconds the red lights were illuminated. The remaining 15 seconds constituted the between-trial interval. The between-trial interval was lengthened in the experimental phase to allow for the possibility of incompatible responses, i.e., between lever-pressing and self-injurious behavior. The lever was not locked during any part of the experimental phase as it was in the conditioning session.

Throughout the experimental phase the Control Group received reward for each appropriate response to the lever, i.e., pressing the lever in the presence of illuminated red discs. The Experimental Group and Drug

Group received no reward for any response throughout the experimental phase and the trials were presented in the same consistent fashion for all groups.

The number of lever-pressings for the experimental phase was recorded by an electric counter attached to the viewing panel. The total number of lever-pressings in the experimental phase for each subject was recorded by the experimenter.

An observer recorded the frequency of responses which resembled head-banging, self-biting, self-scratching, and self-slapping, without concern for intensity, using the one-way vision mirror located in the wall of the experimental enclosure. A part-time observer was used in order to check the reliability of observations. The experimenter was unable to record observed behavior consistently because of the time required for controlling trial periods and manual operation of the experimental apparatus. The primary concern for recording observed behavior was concentrated upon the last 10 seconds of each between-trial interval during the experimental phase. In the experimental situation the observer also recorded behavior, other than self-injury, as closely as possible.

Analysis of the results was carried out by using analysis of variance and t tests.[1]

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[1]This decision was based on consultation with Dr. Carl Marshall, Head of the Statistics Department, Oklahoma State University, Stillwater, Oklahoma.

IV. RESULTS

A total of 63 patients had to be used in the experimental situation in order to obtain 30 subjects who completed both sessions of the experiment. Nineteen of the subjects were unable to learn the lever-pressing response during the conditioning phase. Nine subjects had to be discarded because of irregularities in the procedure, i.e., failure to discontinue ataractic medication seven days before introduction to the experimental situation. Three subjects disqualified themselves because they were apparently unable to withstand the conditions imposed by the experimental phase and refused to stay in the experimental setting. Two subjects were disqualified on the basis of their frequent and intense self-injurious behavior, behavior not found among the other subjects in the conditioning phase.

Since so many of the originally selected subjects failed to complete the experiment, statistical evaluation of the degree of matching could not be computed until the experiment was completed.

The mean age of the patients in the three groups did not differ significantly, F being 1.65 (Table 1). The mean ages were 30.4 years, 38.7 years, and 34.1 years for the Experimental, Control, and Drug groups respectively (Appendix Table 1).

The results of matching on the basis of mental age (determined by the Stanford-Binet Test of Intelligence, Form L) for the three groups did not differ significantly (Table 1). The mental ages were 4.53 years, 4.62 years, and 4.21 years for the Experimental, Control, and

TABLE 1

ANALYSES OF VARIANCE FOR MAJOR CONTROL VARIABLES FOR EXPERIMENTAL, DRUG, AND CONTROL GROUPS

Variable	Source	df	SS	MS	F*
A. Chronological age	Groups	2	346	173	1.65
	Error	27	2.847	105	
B. Mental age	Groups	2	.93	.465	0.34
	Error	27	37.47	1.387	
C. Trials to learning	Groups	2	26	13	1.18
	Error	27	302	11	

*F of 3.35 significant at .05 level

Drug groups respectively (Appendix Table 2).

A more pertinent factor in determining how closely the groups are matched is revealed by the number of trials required to reach the criterion in learning the lever response. The results show that the Experimental Group took an average of 13.8 trials to learn the lever response while the Control Group averaged 13.9 trials and the Drug Group had a mean of 11.9 trials (Appendix Table 3). Statistically the difference was non-significant, F being 1.18 (Table 1).

The matching in terms of sex and living area was much simpler. There were four females and six males in each group. All females used in the experiment reside in one building and all males were from one building.

Matching on the basis of ataractic medication normally administered to these patients was difficult, if not impossible. Although the amount of tranquilizing medication prescribed was somewhat of an index of the frequency and intensity of self-injurious behavior, the difficulty arose for matching purposes from the variety of ataractic drugs used and the differing strengths of each. Thus, matching on this variable was crude.

While the groups were matched on some variables, the groups could not be matched on tranquilization and activity level. For this reason the groups were not considered to be matched when the data were analyzed.

Reliability of Observations

The reliability of observations during the experimental phase was determined by correlating the observations of a full-time observer and a part-time observer. There were a total of twelve paired sets of observations or twelve subjects that both observers observed providing the

data (Appendix Table 4) from which the consistency of the observations was determined. Both the rank difference method (Edwards, 1946) and the sample correlation coefficient (Snedecor, 1956) were used. An r of .98 (Table 2) was obtained for the number of trials in which the subjects exhibited self-injurious responses during the last 10 seconds. The rank difference method yielded a rho of .855 (Table 2). These results indicate high reliability of observations for the number of trials in which a self-injurious response occurred.

An r of .96 and a rho of .86 (Table 2) were obtained for the number of self-injurious responses observed in the last 10 seconds of each trial in the experimental phase. Again, a high degree of consistency between observers was indicated.

Differences between Groups

The first hypothesis which states that self-injury will not increase under non-reward for patients who have a history of self-injurious behavior was first tested by analyzing the results in terms of the number of trials during the last 10 seconds of which a self-injurious response occurred. Analysis of variance for the 3 groups yielded a non-significant F of 0.86 (Table 3). Because the difference between means was large (Table 4), the data were subjected to further analysis through the use of the t test. The largest difference between means was between that of the Experimental and the Control groups, the resultant t of which was 1.61 with probability being less than .20 (Table 4). Therefore, statistical analysis showed that the data from the experimental phase for the number of trials in which a self-injurious response occurred during the last 10 seconds was not statistically significant.

TABLE 2

CORRELATIONS FOR PAIRED OBSERVATIONS OF 12 SUBJECTS DURING THE LAST 10 SECONDS OF EACH TRIAL IN THE EXPERIMENTAL PHASE

Measure	r	rho
Trials in which a self-injurious response occurred	.98	.855
Self-injurious responses	.96	.86

TABLE 3

ANALYSES OF VARIANCE FOR THE EXPERIMENTAL VARIABLES IN THE EXPERIMENTAL PHASE FOR EXPERIMENTAL, DRUG, AND CONTROL GROUPS

Variables	Source	df	SS	MS	F*
I. For the last 10 seconds of each trial:					
A. No. of trials in which a self-injurious response occurred	Treatments	2	90	45	0.86
	Error	27	1406	52	
B. No. of self-injurious responses	Treatments	2	827	413.5	0.95
	Error	27	11,734	434.6	
II. For complete trials:					
A. No. of trials in which a self-injurious response occurred	Treatments	2	61	30.5	0.28
	Error	27	2,911	107.8	
B. No. of self-injurious responses	Treatments	2	794	397	0.41
	Error	27	25,840	957	
C. No. of lever pressings	Treatments	2	10,133	5,066.5	0.99
	Error	27	137,359	5,087.4	

*F of 3.35 significant at .05 level

TABLE 4

TESTS OF MEAN DIFFERENCE BETWEEN THE EXPERIMENTAL, CONTROL, AND DRUG GROUPS FOR THE EXPERIMENTAL VARIABLES IN THE EXPERIMENTAL PHASE

Variables	Groups	Mean	SD	t-value of differences between means[1] Cont.	Drug	Exp.
I. For the last 10 seconds of each trial:						
A. No. of trials in which a self-injurious response occurred	Exp.	7.0	5.73	1.61		
	Cont.	2.8	5.34		.075	
	Drug	5.4	8.9			.045
B. No. of self-injurious responses	Exp.	14.7	13.9	1.79*		
	Cont.	4.7	9.3		1.19	
	Drug	16.7	28.8			0.19
II. For complete trials:						
A. No. of trials in which a self-injurious response occurred	Exp.	8.6	6.08	0.806		
	Cont.	5.1	11.5		0.32	
	Drug	6.8	11.0			0.429
B. No. of self-injurious responses	Exp.	18.8	15.3	0.867		
	Cont.	10.3	25.3		0.76	
	Drug	22.6	41.3			0.26
C. No. of lever pressings	Exp.	88.3	92.9	1.35		
	Cont.	45.6	16.8		1.416	
	Drug	79.3	69.3			0.23

*p less than .10

[1]df for all t tests was 18

The first hypothesis was further tested with the three groups in regard to the number of self-injurious responses occurring in the last 10 seconds of each trial in the experimental phase. The results of an analysis of variance was not significant, yielding an F of 0.95 (Table 3). Since the means of the Experimental and Drug groups again differed greatly from that of the Control Group, the data were subjected to a t test between the means of the various groups. The t, evaluating the difference between the means of the Experimental and Control groups, was 1.79, with p of less than .10 (Table 4). Even though there was a greater disparity between the means of the Control and Drug groups, the resultant t was 1.19, with probability less than .30 (Table 4).

The average number of complete trials for each group in which a self-injurious response occurred was considered next. An analysis of variance resulted in an F of 0.28 (Table 3) which was not significant. Further analysis of the data using t tests indicated no significant differences between the means (Table 4).

Analysis of variance revealed a non-significant F of 0.41 (Table 3) for the average number of self-injurious responses for each group for the entire experimental phase. Computation of tests for differences between means (Table 4) revealed no significant differences.

The analysis of the data in no instance showed differences sufficient for rejection of the hypothesis. It is of interest to note that when comparing means there appears to be a trend in the direction of rejecting the hypothesis. However, this apparent trend is only an observational characteristic and is not sufficient for rejection.

The second hypothesis of this study which states that the use of ataractics will not reduce the frequency of self-injurious behavior under

non-reward conditions for subjects with a history of self-injury was tested by comparing the Experimental and Drug groups in terms of the various measures. The means of the two groups found on the various measures differed very little (Table 4). For mean number of trials in which a self-injurious response occurred in both the last 10 seconds of each trial and complete trials, the Experimental Group was shown to be slightly higher (Table 4). The Drug Group mean was somewhat higher for the number of self-injurious responses that occurred in both the last 10 seconds of each trial and the complete trials of the experimental phase (Table 4). No statistically significant t's resulted in testing differences between the means of the Experimental and Drug groups (Table 4). Therefore, the second hypothesis cannot be rejected.

The hypothesis of this study regarding the activity level was measured by the number of lever-pressings. The hypothesis states that there will be no change in the activity level under non-reward conditions. The number of lever-pressings for each group in the entire experimental phase was subjected to analysis of variance which resulted in a non-significant F of 0.99 (Table 3). The use of t tests in further analyzing the data did not reveal any significant differences between the means (Table 4). On the basis of these data the hypothesis that there will be no change in the activity level under the experimental conditions cannot be rejected.

Observation of the subjects' behavior in the experimental situation appeared to lend some support for rejection of the hypothesis that non-reward would not increase the frequency of self-injurious behavior. This was most clearly seen in patients who were unable to complete the

entire experiment. Several subjects who were originally members of the Experimental Group acquired the conditioned response to the lever quite readily, but when introduced into the experimental phase were unable to stay in the experimental situation and even refused to stay in the building. Other subjects in the Experimental Group would sit in the corner of the enclosure between trials and jump to the lever when the red lights came on. Subjects in the Control Group seemed to be less active and much more task oriented in the experimental situation. The Drug Group resembled the Experimental Group with exception that none of the former subjects, once they had reached the experimental phase left the experimental situation until the trials were completed. However, one member of the Drug Group did attack the apparatus by kicking the pan frequently and intensely.

V. DISCUSSION

The statistical analysis of this study showed no significant differences between the three groups under the experimental conditions. Therefore, the null hypothesis that there would be no change in the behavior of self-injurious mental retardates under non-reward conditions could not be rejected despite the presence of a trend supporting the hypothesis of frustration which is reflected by the means of the different groups. The one positive conclusion that can be derived from the data obtained is that the presence of the predicted trend observed in the different groups indicates the need for more extensive experimentation with the factors involved. The presence of the predicted trend also indicates that the non-reward situation could have produced the assumed frustrating effect.

It was previously mentioned that ataractic medication had been believed to be 50 to 75 per cent effective in decreasing the frequency of self-injurious behavior. For the number of trials in which a self-injurious response occurred the non-reward drug subjects averaged midway between the reward non-drug subjects and the non-reward non-drug subjects. In all cases the non-reward subjects, both drug and non-drug, were different from the reward subjects in terms of means. However, no statistically significant difference was found between drug and non-drug subjects. On the basis of the average activity for the drug and non-drug subjects under non-reward conditions, little difference could be noted even on the basis of inspection. These results

could indicate a number of things. The use of ataractics could reduce the frequency of self-injury in routine activities by calming the mental retardate, but with specific induced frustration the mental retardate responds as if he were on no medication. Since drugs of any kind only produce a condition, it is possible that the expected effects of alleviating the abnormal behavior may be obtained, as in mental hospitals, by capitalizing upon the drug induced state to use other treatment measures in an attempt to deal more directly with the apparent emotional problem involved. The results reported here indicate that ataractics are ineffective even in the treatment of symptomatic behavior when specific frustrating conditions are introduced.

One factor that seems important in the results of this study is the presence of extreme scores in each of the groups. In most cases the variance within groups was greater than that between groups. This usually-predominant within-group variance results from the presence of extreme scores and indicates a need for the use of a larger number of subjects when conducting experiments with mental retardates. Because of difficulties in matching patients from a population of institutionalized mental retardates, small groups seem abnormally susceptible to extreme chance variation.

In working with self-injuring mental retardates, the availability of subjects requires consideration. It has been estimated that self-injury is found in approximately 10 per cent of the institutionalized mental retardates. Although 10 per cent amounts to a relatively large number, it must be remembered that the largest proportion of self-injurious behavior is found among patients functioning intellectually at the idiot level which, for the most part, excludes them from complex

behavioral experimentation. Since this is so, investigations of behavior using this population necessitates a simple experimental design.

VI. SUMMARY AND SUGGESTIONS FOR FURTHER STUDY

This investigation was concerned with various forms of self-injurious behavior found among institutionalized mental retardates. There is a dearth of literature concerning these patients who bang their heads against walls or hit, slap, or scratch themselves although it was estimated that this behavior is found in 10 per cent of institutionalized mental retardates.

For this study, self-injurious behavior was hypothesized to be the result of an inability on the part of these individuals to cope with the demands imposed upon them by their environment. Since the original cause would probably be impossible to determine, frustration was postulated as the primary factor in precipitating self-injurious behavior. The hypotheses for this study were:

1. that non-reward in a reward situation will not cause an increase in the frequency of self-injury in mental retardates whose behavior in the past has been characterized by self-injury.
2. that the use of ataractics will cause no change in the frequency of self-injurious responses of mental retardates when they are confronted with non-reward in a situation which previously resulted in reward.
3. that non-reward in a reward situation will not cause an increase in activity for mental retardates.

To test these hypotheses, an experimental situation was designed

to induce frustration. Three groups of ten imbecile level mental retardates from Winfield State Hospital and Training Center, Winfield, Kansas, acquired a conditioned response to a Skinneroid apparatus designed for this experiment. Two of the groups, the Experimental and Control groups, had their ataractic medication discontinued seven days prior to the experiment, while the remaining group, the Drug Group, continued its usual medication throughout. After acquiring the conditioned response for this experiment, the Experimental and Drug groups were subjected to non-reward conditions involving the previously learned task while the Control Group continued to receive reward for appropriate responses. The frequency of self-injurious responses was recorded by an observer and the activity level was measured mechanically.

The results of the experiment were not statistically significant but inspection of the data seemed to lend some support for rejection of the first and third hypotheses. The trend indicated by the results suggests that further study might be fruitful.

It is suggested that, in the future, studies with mental retardates include the use of large groups because of difficulties found in attempting to match patients as a result of the presence of wide behavioral variability among patients functioning intellectually at the same level. The use of large groups would help in canceling out extreme within-group variation and allow for a statistical interpretation of the relationship between groups. If large groups are to be used, the particular task employed must be chosen on the basis of simplicity because of the vast range in age and intelligence found among institutionalized mental retardates.

The need for adequate behavioral measures to be used with mental

retardates was indicated by this investigation. As in other experimental work the more objective a measure used the more accurate the results obtained. However, frequently, as in this case, difficulties are imposed by the nature of the task involved and the behavior that is to be measured. Apparently a few more studies of this type will have to be completed before adequate measuring devices can be developed.

In line with the basic presupposition of this study, future investigation might focus upon how the mental retardate perceives himself. The implication for the present study is that if the self-injurious retardate does not conceive of himself as distinct from the environment, his self-injurious behavior may be perceived by him as directed toward the environment, the most immediate of which happens to be himself. Some observers have been unable to determine the presence of a self concept among retardates. However, with the methods available these observations are debatable.

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APPENDICES

APPENDIX TABLE 1

CHRONOLOGICAL AGE IN YEARS FOR
SUBJECTS IN EACH GROUP

Subject	Experimental group	Control group	Drug group
1.	39	37	27
2.	31	41	23
3.	30	38	19
4.	32	60	48
5.	40	53	57
6.	26	38	50
7.	28	37	35
8.	28	30	28
9.	26	26	23
10.	24	27	31
Mean	30.4	38.7	34.1

APPENDIX TABLE 2

MENTAL AGE IN YEARS FOR SUBJECTS
IN EACH GROUP

Subject	Experimental group	Control group	Drug group
1.	4.5	4.7	5.0
2.	6.5	3.1	3.0
3.	2.3	4.8	4.5
4.	3.5	5.8	5.9
5.	3.0	3.7	3.5
6.	5.0	4.5	4.1
7.	5.5	4.8	5.3
8.	5.1	3.5	4.3
9.	5.0	7.0	4.5
10.	4.9	4.3	2.0
Mean	4.53	4.62	4.21

APPENDIX TABLE 3

NUMBER OF TRIALS REQUIRED TO REACH LEARNING CRITERION IN THE CONDITIONING PHASE FOR SUBJECTS IN EACH GROUP

Subject	Experimental group	Control group	Drug group
1.	27	19	14
2.	13	16	13
3.	15	10	10
4.	19	19	10
5.	13	13	11
6.	11	20	16
7.	10	10	11
8.	10	10	10
9.	10	10	10
10.	10	12	14
Mean	13.8	13.9	11.9

APPENDIX TABLE 4

DATA FROM 12 PAIRED OBSERVATIONS IN THE LAST 10 SECONDS OF EACH TRIAL IN THE EXPERIMENTAL PHASE

Subject	First Observer		Second Observer	
	No. of trials	No. of self-punitive responses	No. of trials	No. of self-punitive responses
1.	3	4	5	5
2.	1	1	2	2
3.	5	15	4	6
4.	1	4	1	1
5.	0	0	0	0
6.	1	3	1	3
7.	4	16	1	4
8.	8	14	3	3
9.	6	33	3	20
10.	21	51	23	30
11.	38	135	36	50
12.	8	8	7	9

APPENDIX TABLE 5

THE NUMBER OF TRIALS FOR EACH SUBJECT IN WHICH A SELF-INJURIOUS RESPONSE OCCURRED DURING THE EXPERIMENTAL PHASE

Subject	Experimental group		Control group		Drug group	
	Last 10 sec.	Complete trials	Last 10 sec.	Complete trials	Last 10 sec.	Complete trials
1.	3	3	0	0	0	0
2.	13	18	18	39	0	0
3.	1	4	1	1	0	0
4.	8	10	0	0	13	24
5.	2	4	0	0	1	1
6.	4	6	6	8	3	3
7.	8	8	1	1	0	0
8.	21	22	1	1	29	32
9.	5	6	1	1	8	8
10.	5	5	0	0	0	0
Mean	7.0	8.6	2.8	5.1	5.4	6.8

APPENDIX TABLE 6

THE NUMBER OF SELF-INJURIOUS RESPONSES FOR EACH SUBJECT THAT OCCURRED IN THE TRIALS OF THE EXPERIMENTAL PHASE

Subject	Experimental group			Control group			Drug group		
	First 10 sec.	Last 10 sec.	Complete trials	First 10 sec.	Last 10 sec.	Complete trials	First 10 sec.	Last 10 sec.	Complete trials
1.	0	4	4	0	0	0	0	0	0
2.	17	25	42	54	32	86	0	0	0
3.	4	1	5	0	3	3	0	0	0
4.	2	8	10	0	0	0	16	15	31
5.	6	2	8	0	0	0	2	1	3
6.	3	16	19	2	6	8	0	11	11
7.	3	14	17	0	1	1	0	0	0
8.	2	51	53	0	1	1	41	98	139
9.	4	12	16	0	4	4	0	42	42
10.	0	14	14	0	0	0	0	0	0
Mean	4.1	14.7	18.8	5.6	4.7	10.3	5.9	16.7	22.6

APPENDIX TABLE 7

THE NUMBER OF LEVER RESPONSES FOR EACH SUBJECT IN THE EXPERIMENTAL PHASE

Subject	Experimental group	Control group	Drug group
1.	44	40	254
2.	42	39	27
3.	352	43	47
4.	48	38	45
5.	51	96	85
6.	40	40	39
7.	35	40	39
8.	70	41	49
9.	145	40	44
10.	56	39	164
Mean	88.3	45.6	79.3

VITA

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Thesis: THE RELATIONSHIP BETWEEN FRUSTRATION AND SELF-INJURIOUS BEHAVIOR IN MENTAL RETARDATES

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Professional experience: Served in the United States Army from 1951 to 1954; worked as a Psychometrist at the Boy's Vocational School, Lansing, Michigan, the summer of 1956; awarded a graduate teaching assistantship at Oklahoma State University, Stillwater, Oklahoma, for two academic years, 1956-57 and 1957-58; received a Clinical Psychology Assistantship at the El Reno Federal Reformatory, El Reno, Oklahoma the summer of 1957; since June, 1958 has been working as a Clinical Psychologist at the Winfield State Hospital and Training Center, Winfield, Kansas, part of which time was spent collecting data described in this thesis.