

**BEHAVIOR MODIFICATION TECHNIQUES FOR SEVERELY
AND PROFOUNDLY MENTALLY RETARDED INDIVIDUALS
DISPLAYING SELF-INJURIOUS BEHAVIOR**

TERESA DELAWSON MITCHELL

BEHAVIOR MODIFICATION TECHNIQUES FOR SEVERELY
AND PROFOUNDLY MENTALLY RETARDED INDIVIDUALS
DISPLAYING SELF-INJURIOUS BEHAVIOR

A Research Paper
Presented to the
Graduate and Research Council of
Austin Peay State University

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

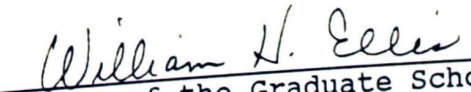
by
Teresa Delawson Mitchell
December 1988

To the Graduate and Research Council:

I am submitting herewith a Research Paper written by Teresa Delawson Mitchell entitled "Behavior Modification Techniques for Severely and Profoundly Mentally Retarded Individuals Displaying Self-Injurious Behavior". I have examined the final copy of this paper for form and content, and I recommend that it be accepted in partial fulfillment of the requirements for the degree Master of Arts, with a major in Psychology.


Major Professor

Accepted for the Graduate and
Research Council:


Dean of the Graduate School

ACKNOWLEDGEMENTS

The author wishes to express sincere appreciation to Dr. Susan Kupisch, Associate Professor of Psychology and Chairperson of the Department of Psychology, Austin Peay State University, for her guidance, support, concern, and extreme patience.

Appreciation and gratitude is extended to Dr. Elizabeth Stokes, Professor of Psychology (retired), Austin Peay State University for her encouragement, support, and devotion in encouraging the study of individuals with mental retardation. Additionally, the author wishes to thank her children, mother, and friends for their help, understanding, and support while working on this project.

TABLE OF CONTENTS

CHAPTER	PAGE
1. Introduction.....	1
2. Review of Literature.....	4
3. Conclusions.....	21
REFERENCES.....	27

CHAPTER 1

Introduction

Self-injurious behavior in severely and profoundly mentally retarded individuals is a problem often difficult to analyze and even more difficult to treat.

Self-injurious behavior is a term used to describe a broad array of responses which result in physical damage to the individual displaying the behavior (Halpern & Andrasik, 1986). Self-injurious behavior generally involves topographically similar repetitious and chronic response patterns (Wieseler, Hanson, Chamberlain, & Thompson, 1985). A narrower definition could be "overt acts directed toward oneself that have restricted spatial and temporal topographies, whose rate of occurrence is reliably observable, and whose consequences are actual or threatened physical damage" (Schroeder, Schroeder, Rojahn, & Mulick, 1981, p.61).

There is widespread agreement that mentally retarded individuals, especially those institutionalized, are more likely to display maladaptive behaviors, such as aggression, feeding disorders, stereotypical behaviors, and self-injury (Duker, Druene, Jol, & Oud, 1986). Several studies have surveyed the prevalence of self-injurious behavior in institutionalized mentally retarded individuals. Griffin, Williams, Stark, and Altmeyer (1986) found when they surveyed 13 residential facilities for mentally retarded individuals in Texas, 19.8% of the clients were either

severely or profoundly mentally retarded. Fifty-eight percent of the clients engaged in more than one self-injurious behavior response topography, 57% of the clients emitted self-injurious behavior at least once per day, and 33.1% were on a formal positive treatment program. Only 6.8% were on a formal aversive treatment program. In this study, 56.8% were males and 43.7% were females, which was equal to the male/female ratio in the residential facility.

Rojahn (1986) conducted a study on noninstitutionalized mentally retarded individuals in the Federal Republic of Germany. Among 25,872 mentally retarded persons, 1.7% were found to display self-injurious behavior; those who displayed self-injurious behavior were diagnosed as more severely retarded. This greatly contrasted with the findings by Hill and Bruininks (1984), which found a prevalence of 11.1% among 964 residents from 16 community residential facilities in the United States. It is apparent, however, that self-injurious behavior is prevalent in various forms in the mentally retarded population, especially individuals institutionalized in residential facilities.

At present only two syndromes are known to have self-injurious symptoms: Lesch-Nyhan Syndrome and Cornelia de Langes Syndrome. Lesch-Nyhan Syndrome is a sex-linked disorder affecting metabolism. The individual demonstrates spasticity, choreoathetosis, possible mental retardation, elevated urine acid, self-mutilation, and aggressive

behaviors. Biting of the oral structures and fingers is the most common form of mutilation. In Cornelia de Lange's Syndrome the individual may be characterized by low birth weight, retarded growth, and digital abnormalities. No consistent chromosomal abnormalities have been found for this syndrome. The self-injurious behaviors include self-inflicted blunt trauma, such as hitting the face, extremities, or trunk area, and self-biting. No other physiological condition predisposes self-injurious behavior in the mentally retarded population (Schroeder et al 1986).

In treating self-injurious behavior in severely and profoundly mentally retarded individuals, several methods have been studied. The procedures most cited in the literature include overcorrection, physical and mechanical restraint procedures, positive reinforcement, and medication.

CHAPTER 2

Review of Literature

In reviewing behavior modification techniques designed to reduce or eliminate self-injurious behavior in severely or profoundly mentally retarded individuals, various methods have been implemented with varying success.

Halpern and Andrasik (1986) investigated the use of overcorrection to treat self-injurious behavior. Their subject was a 23 year old, nonverbal, profoundly mentally retarded male. The subject displayed self-injurious behavior in the form of headbanging when discontent, usually as a means to avoid task demands. Contingent upon each headbanging episode, the subject was immediately reprimanded. The overcorrection procedure consisted of the trainer manually guiding and verbally prompting the subject to move his head to the right to the left, and back with each position being held for 15 seconds. If the subject resisted at any point, his head was maintained in one position until 15 second had elapsed without resistance. This overcorrection treatment was continued for 35 weeks. The study yielded significant results, but by no means eliminated the self-injurious behavior. In addition to significantly reducing the self-injurious behavior, a significant increase in the subject's social interaction was noticed along with a noticeable increase in overall happiness. In a follow-up study a year later moderate maintenance of the effect of time was found.

Another study investigating the use of overcorrection with mentally handicapped individuals was conducted by Barton and Lagrow (1983). Their first subject was a 21 year old profoundly retarded female. She was also deaf and blind. Her self-injurious behavior consisted of hitting her cheeks and eyes. Her inappropriate behaviors included self-injurious, destructive, and aggressive behaviors. These behaviors limited her ability to function in educational and vocational programs. The overcorrection intervention was implemented after baseline data had been collected. The overcorrection was initially contingent upon demonstration of aggressive behavior towards others and consisted of holding the subject's arms perpendicular to her body, then above head, and then down to her sides with each position being held for 5 seconds. This overcorrection was repeated continuously for 10 minutes. On the 26th day of treatment self-injurious behavior became a contingency for the overcorrection procedure. The reported results indicated her self-injurious behavior had decreased from 78 incidents per day during baseline to an average of three incidents per day at the end of the study.

Luiselli and Michaud (1983) investigated the use of overcorrection to reduce self-injurious behavior in two subjects. The first subject was an 11 year old, moderately retarded, visually impaired male. His self-injurious behavior included hits to the head or face with one or both hands. This was particularly dangerous as this subject

had a cataract in one eye and a surgically repaired retinal detachment in the other eye. The procedures were implemented in an ABAB design. The overcorrection phase consisted of required participation in five minutes of functional arm-movement training upon displaying self-injurious behavior. If he refused to comply with the arm-movement training, he was physically guided into participation. The overcorrection procedure, at the end of the reinstated treatment phase, resulted in a decrease from the initial baseline of 4.2 incidents per hour of hits to the head or face to .48 incidents per hour. One month later self-injurious behaviors was an average of .36 incidents per hour with the continuance of the overcorrection procedure.

Luiselli and Michaud's (1983) second subject was a severely mentally retarded, totally blind, 19 year old male who displayed self-injurious behavior in the form of arm biting. His arm biting had produced continuous dermal abrasion and numerous open sores on both arms. These procedures were implemented in an AB design. The treatment program consisted of restitutorial overcorrection as a consequence of arm biting. The restitutorial overcorrection consisted of the subject being led to a bathroom, placed in front of a sink, and physically guided through a specific first-aid sequence. Each overcorrection procedure lasted approximately five minutes. The treatment program was continued for 15 weeks and yielded positive results. During the baseline phase, arm biting occurred an average of 9.8

incidents each week. When the treatment program was implemented, arm biting was reduced to an average of 2.3 incidents per week. Only four instances of arm biting occurred during the four-month follow-up period and no incidents occurred during the final five weeks of data collection. The utilization of overcorrection in these two subjects suggested that when used in conjunction with other methods, such as positive reinforcement, self-injurious behavior can be significantly reduced, even with subjects of limited cognitive ability and visual impairments.

Many retarded persons exhibit behaviors that seem designed to prevent their individuals forms of self-injurious behavior by utilizing what has been called self-restraint, such as entangling their limbs in their clothing or placing their hands under their legs so they cannot slap or hit themselves. Self-restraint is incompatible with self-injurious behavior.

Silverman, Wantanabe, Marshall, and Baer (1984) investigated this concept by providing protective clothing to a 13 year old male who was profoundly mentally retarded and legally blind. His self-injuries included punches to the eyes and chin, kicks to the leg, and slams of the forearm against hard objects, which produced localized bruises and swelling. The protective clothing included a hard plastic helmet with a clear plastic face mask and padding a 1.9 cm thick forearm pad attached to the back of each shoe to cover each heel and the back of the leg. The

subject was given materials, such as a musical toy, cubical blocks, and a metal dish as a receptacle for the blocks. He was encouraged to manipulate these objects when not self-abusive.

The results of this study supported the concept that strategic use of protective clothing can be a practical and simple means of reducing self-injurious behavior. It may also free the previously restrained limbs, giving the individual an opportunity to become more involved in the acquisition of necessary skills.

To further support the use of protective equipment, Dorsey, Iwata, Reich, and David (1982) investigated the use of protective equipment for the treatment of self-injurious behavior. Their first subject was a 16 year old, profoundly retarded male. He was also visually and hearing impaired. He had been institutionalized since the age of two. His self-injurious behaviors included head hitting and hand biting which resulted in subdural hematomas and abrasions of the skin. Their second subject was a 16 year old, severely retarded female. She had been institutionalized since the age of six. Her self-injurious behaviors included inserting her fingers into her eye sockets, hand biting, and head hitting which resulted in superficial cuts, callouses, and scar tissue. Their third subject was a 14 year old, severely retarded male. He was also visually impaired. He had been institutionalized since the age of four. His self-injurious behavior consisted of inserting his index

finger into the eye socket between the eye ball and eye lid. This resulted in swelling of the entire eye, as well as fracturing a cataract.

Two experiments were conducted by Dorsey et al (1982). All subjects were used in each experiment and baseline data was collected for the self-injurious behaviors for each subject. For the first experiment the following treatment procedures were implemented: reinforced toy play plus verbal reprimand; reinforced toy play plus verbal reprimand plus mist; continuous protective equipment; and two-minute protective time-out plus sensory stimulating toy play. The results indicated significant reduction in self-injurious behaviors with the continuous protective equipment condition. Low levels of self-injurious behaviors were maintained with the two-minute protective time-out plus sensory stimulating toy play condition. The results suggested that protective equipment may be useful in treating self-injurious behaviors. Manipulation of materials (toy play) and self-injurious behavior appear to be inversely related.

The second experiment included the same subjects and investigated the use of two-minute protective time-out plus contingent sensory stimulatory toy play. Protective equipment, as used in the first experiment, was placed on the subjects for a period of two minutes upon the display of self-injurious behavior. Upon the absence of self-injurious behavior, stimulating toys were made available. The results

yielded a reduction in self-injurious behaviors for all three subjects. This study indicated that the combination of contingent protective equipment and access to sensory-stimulating toys (positive reinforcement) may maintain decreased self-injurious behaviors after treatment.

Ball, Datta, Rios, and Constantine (1985) implemented flexible arm splints to assist in controlling finger biting of an 11 year old nonambulatory victim of Lesch-Nyhan syndrome and finger sucking of a 38 year old, profoundly retarded male. The flexible arm splints allowed control of hand-to-mouth contacts without restricting range of motion.

Ball's et al (1985) first subject's finger biting was serious and had necessitated his being kept in posey (soft-tie) restraints. When released from the posey restraints in order to collect baserate data, the incidents of finger biting were extreme. A significant reduction of finger biting was found, as well as greater cooperation in training tasks, with the implementation of the flexible arm splints. An additional factor in the significant reduction of finger biting may have been the positive reinforcement received, since there was increased cooperation and successful manipulation of training tasks.

The second subject's inappropriate behavior of finger sucking was also significantly suppressed by the implementation of the flexible arm splints. In follow-up sessions with and without the flexible splints, it was apparent from the data that application of the flexible

splints continued to significantly decrease finger sucking.

The implication of this study is that flexible splints may prove to be an effective, less restrictive alternative to more restrictive restraints, such as the traditional posey restraints. Flexible arm splints are convenient, easy to apply, require minimal staff time, and allow the individuals the opportunity for exploration of their environment. The individual, thus, will have the opportunity to receive more positive reinforcements (Ball et al 1985).

Another method of reducing self-injurious behavior is time-out when self-injurious behavior is displayed. Rolider and van Houten (1985) studied the effects of movement suppression time-out. This involved punishing any movement or verbalization while a client was placed in a time-out area. In this study four experiments were evaluated. Rolider and van Houten's (1985) first subject was a 10 year old boy who was labeled psychotic and displayed tantruming that involved headbanging against the floor or walls, scratching his face, and hitting himself in the head or chest with clenched fists. The first experiment tried application of a Differential Reinforcement of Other Behavior (DRO) procedure consisting of praise and reinforcement of an edible every 15 minutes he was tantrum free. No produced change in the frequency of self-injurious behavior was noted. A marked decline in self-injurious behavior after the introduction of DRO plus movement

suppression time-out was noted. The procedure rapidly eliminated the behavior in all settings.

Rolider and van Houten's (1985) second experiment involved a 9 year old boy labeled autistic. The subject displayed self-injurious behavior of biting himself and mouthing objects. The biting consisted of grasping his arm between his teeth which frequently produced bruising and broken skin. Again, introduction of DRO procedure had no effect on either arm biting or mouthing objects. The addition of movement suppression produced rapid elimination of both behaviors. This procedure only had to be implemented 14 times for total elimination of the biting.

This study demonstrated that movement suppression time-out plus DRO procedure successfully suppressed self-injurious behavior in these psychotic and developmentally delayed individuals. An underlying principle is that movement suppression plus DRO increases the difference between the reinforcement available in the time-out and time-in environments by depriving the subject of numerous sources of reinforcements in the time-out setting. Movement suppression time-out may seem restrictive, but it is noted that the time-out period lasts for only 2 to 3 minutes. It appears to be very effective after only a few applications of the procedure.

In another study focusing on self-injurious behavior, Smith (1985) implemented a Differential Reinforcement of Other Behavior (DRO) with an 18 year old, severely autistic

male. His self-injurious behavior included severe headbanging, requiring staff to intervene for the subject's safety. His self-injurious behavior usually occurred in the presence of food and was usually accompanied by verbal requests for food. The DRO was implemented on a three-minute schedule. Staff and food snacks were used as reinforcers. Provided the subject was not aggressive or self-injurious, he received food immediately upon request in hopes of substituting language for aggression or self-injury. A significant increase in the amount of time spent engaged in appropriate nonaggressive activities was found by the 16th day of treatment. This study supported the utilization of positive reinforcement in treating self-injurious behaviors.

Hamad, Isley, and Lowry (1985) found that providing a high density of positive reinforcement, including verbal praise, edible reinforcers, and preferred activities, significantly reduced the amount of time an individual was required to remain in mechanical restraints. These researchers conducted a case study on a 41 year old man who had been institutionalized since the age of six and whose self-injurious behavior had begun approximately at age eight. Initially, his self-injurious behavior consisted of hitting his head with his fists. Four years prior to this case study, his self-injurious behavior resulted in detached retinas and blindness in both eyes due to his hitting the area around the eyes with his knees. The mechanical

restraint used was a brace-like restraint device attached to his hip and knee area which prevented knee to head contact. It allowed for ambulation and sitting.

Initially, the subject was released from the mechanical device for one 15 minute trial. During this release the subject was provided with a high density of positive reinforcers. These reinforcers included verbal praise, physical contact, edible reinforcers, and various preferred activities. Part of the treatment procedure included physically prompting him to perform a behavior incompatible with his self-injurious behavior. While in the mechanical restraint device, the subject was spoken to only for basic needs, such as feeding or toileting. All possible positive reinforcements were withheld when self-injurious behavior was attempted. These procedures were continued for a total of six months, at which time the need for the restraint was completely eliminated. This study suggested that to decrease or prevent self-injurious behavior in a severely retarded individual, one must provide the individual with appropriate positive reinforcers, social interaction, and preferred activities.

In relation to the use of positive reinforcers, Lockwood and Bourland (1982) structured a subject's environment to appropriately facilitate and maintain toy use. Their first subject was a 17 year old, nonambulatory, profoundly retarded female with a history of nail biting. Mechanical restraints at the wrist had been implemented.

The second subject was a 19 year old, deaf, nonambulatory, profoundly mentally retarded male with a history of arm biting and face slapping. Both subjects resided in a state residential facility.

For the first subject, appropriate toys were made available, either loose in the subjects lap or attached by an elasticized line to a metal hanger affixed to the side of the wheelchair at eye level. Initially, with given reinforcements and the attached toy condition, the reduction of finger biting was rapid and minimally variable. In the final stage the reduction of finger biting was maintained but the presence of attached toys even after the reinforcements had been faded.

The second subject's conditions were sequenced in an ABAB design. Introduction of toys attached to a hanger resulted in a substantial reduction in both arm biting and face slapping, while returning to a no-toys condition resulted in a substantial increase in self-injurious behavior. This was reversed when the attached toys were reintroduced with both self-injurious behaviors stabilizing at near zero frequency levels.

This study supported previous studies showing that providing activity materials in the environments of mentally retarded individuals may lessen dysfunctional behaviors such as self-injurious behaviors. This is true even when other positive reinforcers are discontinued.

To further support the utilization of positive reinforcers, Freschi and DeLeo (1982) utilized positive interference to reduce a 9 year old autistic male's severely high rate of self-abusive behavior. Freschi and DeLeo (1982) defined positive interference as "therapeutic interruption of a high-rate self-abusive or self-stimulatory behavior with a reinforceable desired behavior" (p. 77). The procedure consisted of interrupting self-abusive behaviors, either by blocking or preventing the behavior to occur. The child was immediately redirected into performing an already targeted positive behavior. At this point the child went through an instructional sequence of brief practice of the selected positive behavior. Whenever the child displayed self-abusive behavior while working on a given task the behavior was interrupted, intervention of the positive behavior occurred, and the child returned to the original task. Reinforcement was presented each time the positive behavior was performed. The results indicated a 12% reduction of self-abusive behavior at the end of one year.

Gaylord-Ross, Weeks, Lepner, and Gaylord-Ross (1983) conducted a study to investigate whether positive reinforcement or punishment procedures suppressed self-injurious behaviors in severely retarded, nonverbal individuals. Self-injurious behaviors of the 22 subjects studied included either hand biting or head striking. The experimental conditions consisted of presentation of a task

with the following treatment procedures: differential reinforcement of incompatible behaviors; omission training; reinforcement withdrawal; and contingent restraint. These researchers found that contingent restraint proved to be the most effective in reducing the frequency of self-injurious behaviors from baseline levels. The contingent restraint consisted of a verbal directive for the subject to put his hands down upon display of the target behavior. If this directive proved ineffective, his hands were held to his side for a one-minute interval. Eventually, the trainer made no verbalizations, but controlled the display of self-injurious behavior with a gesture. This study suggested contingent restraint might prove beneficial in initial reduction of self-injurious behaviors.

Another area frequently investigated to control self-injurious behaviors is the administering of medications. Barron and Sandman (1983) investigated the relationship of self-injurious behaviors and stereotypy with the response of mentally retarded individuals to sedative-hypnotic medications. These researchers thought that a disturbed endogenous opiate system may be involved in initiating and maintaining self-injurious behaviors by elevating the pain threshold. In individuals with chronic insensitivity to pain, evidence indicated that treatment with naloxone, a putative endogenous opiate antagonist, has been helpful.

Self-injurious behavior patients who experience favorable responses to naloxone often display "paradoxical" (Barron and Sandman, 1983 p. 178) responses to analgesic agents, such as excitation rather than sedation to standard doses of narcotics, sedatives, and hypnotics. Barron and Sandman (1983) found that in studying 100 mentally retarded individuals, a higher percentage of individuals who exhibited self-injurious behaviors or stereotypy also displayed paradoxical responses to sedatives when compared with those individuals who did not exhibit self-injurious behavior or stereotypy. An impaired endogenous opiate system may be a particular type of syndrome for self-injurious behavior.

In a case study of an 8 year old, multiply handicapped boy who was severely mentally retarded, due to agenesis of the corpus callosum, Davidson, Kleene, Carroll, and Rockowitz (1983) found that administration of naloxone to their subject had no effect on frequency of headbanging. From clinical observations, however, the quality of the headbanging became less intensive during the drug administration despite the maintenance of a high response rate. Observations indicated that fewer hard hits were noted and the subject appeared to wince more often when injury occurred.

To further support the use of naloxone in reducing self-injurious behavior in developmentally delayed individuals, Sandman, Datta, Barron, Hoehler, Williams, and

Swanson (1983) studied two individuals. The first subject was a 26 year old, nonverbal, profoundly retarded male who had been institutionalized since the age of eleven. He had developed a calloused thickening of his skull, "cauliflower ear", and ecchymosis of his right eye from years of self-injurious behavior. The second subject was a 16 year old, nonverbal male, who was profoundly retarded. He had developed "cauliflower ear", partial separation of his left ear lobe, multiple scars, and various abrasions from self-injury. He also had been institutionalized since the age of eleven.

Both subjects displayed paradoxical responses to analgesic agents. The first subject, the 16 year old male, responded positively to the administration of naloxone within the first 10 minutes by significantly reducing the frequency of self-injurious behavior, although the effects began to diminish 70-80 minutes after the administration of naloxone. The second subject's frequency of self-injurious incidents were virtually eliminated after treatment. Neither subject developed ancillary adaptive or maladaptive behaviors after treatment of naloxone. The second subject even developed more interpersonal and play behavior during the time he received the drug treatment.

Szymanski, Kedesdy, Sulkes, Cutler, and Stevens-Our (1987) conducted another study with the use of naloxone on self-injurious behavior. Their first subject was a 21 year old female who was nonverbal and diagnosed as profoundly

mentally retarded. She first displayed self-injurious behavior at age 14 by scratching, headhitting, and headbanging to the point of detaching her retina which resulted in total blindness. She displayed self-injurious behavior at a higher frequency and at greater severity when distressed, although her display of self-injurious behavior was not contingent upon environmental events.

Szymanski's et al. (1987) second subject was a 29 year old nonverbal, profoundly retarded, blind male with a history of prematurity, retrolental fibroplasia, and convulsive seizures. His self-injurious behaviors began at the age of 23 and had progressively increased. His self-injurious behavior included face slapping, biting, and aerophagia. He was often withdrawn, agitated, and unpredictable.

Both subjects were administered naloxone with no measurable effects on the frequency of self-injurious behavior. These researchers did not rule out the possibility that an opoid dependent mechanism might exist in some cases of self-injurious behaviors. They suggested that the opoid dependency might have triggered the initial episodes of self-injurious behavior which was then somehow reinforced, thus resulting in a learned inappropriate habit.

Conclusions

The prevalence of self-injurious behavior in severely and profoundly mentally retarded individuals constitutes a need for treatment in order to reduce serious injuries sustained while exhibiting such maladaptive behaviors. Determining the etiology, such as Lesch-Nyhan Syndrome and Cornelia de Lange's Syndrome, or a disturbed endogenous opiate system, might lead to a specific method to deal with the self-injurious behavior.

If the self-injurious behavior is a result of a disturbed endogenous opiate system, there is a possibility that administration of naloxone may alleviate the behavior by lowering the threshold of pain experienced by the individual. Not all individuals who display self-injurious behavior display a paradoxical effect to sedatives, making the administration of naloxone unusable in certain individuals. Even if administration of naloxone reduces the threshold of pain, the behavior may have already been so ingrained in the individual's habit system that behavior modification techniques are necessary to change the self-injurious behavior.

It seems that the underlying factor in changing self-injurious behavior is the use of positive reinforcers. Each study reviewed used manipulation of a preferred reinforcer in addition to the procedure utilized. Once the individuals learned that abstaining from self-injurious

behavior allowed them the opportunity to receive a preferred reinforcer (i.e. staff attention, play objects, or edible reinforcers), their attention to those reinforcers increased, thus reducing their self-injurious behaviors.

Halpern and Andrasik (1986) found that the use of overcorrection to reduce headbanging was successful, as did Barton and Lagrow (1983), and Luiselli and Michaud (1983). The above researchers also used positive reinforcers in conjunction with the overcorrection procedures. Silverman et al. (1984) utilized positive reinforcers in conjunction with protective clothing to reduce self-injurious behavior. Dorsey et al. (1982) also used protective equipment coupled with toy play to reduce self-injurious behavior. Ball et al. (1985) implemented flexible arm splints to assist in controlling finger biting and finger sucking. Ball et al. (1985) found that positive reinforcement assisted in decreasing these behaviors in their subjects.

Rolider and van Houten (1985) reduced self-injurious behavior of their subjects by implementing movement suppression time-out. In addition to the time-out, positive reinforcers were implemented when the subjects were not in a time-out phase. Their results indicated that minimal progress was made when only time-out was used, but significant reduction of the self-injurious behavior was found when positive reinforcers were implemented. The same results were found by Smith (1985), Hamad et al (1985), and Freschi and DeLeo (1982).

Lockwood and Bourland (1982) structured their subjects' environment to facilitate the use of toys. Finger biting, arm biting, and face slapping were significantly reduced once the subjects were given free opportunity to occupy themselves with the presented toys. Again, successful reduction of self-injurious behavior was demonstrated through the use of preferred reinforcers, such as the implementation of the toys.

In reviewing the literature, much additional research needs to be implemented to find appropriate and successful behavioral intervention procedures for the reduction of self-injurious behaviors. It can be hypothesized that structuring an individual's environment with easy access to preferred reinforcers significantly reduces self-injury in severely and profoundly mentally retarded individuals. This is supported by the studies conducted by Halpern and Andrasik (1986), Silverman et al. (1984), Barton and Lagrow (1983), Luisellie and Michaud (1983), Dorsey et al. (1982), Ball et al. (1985), Rolider and van Houten (1985), Smith (1985), Fresch and DeLeo (1982), Hamad et al. (1983), and Lockwood and Bourland (1982).

To further investigate this hypothesis, a study which structures individuals' environments so preferred positive reinforcers are easily assessable is proposed. This study would be conducted in an ABAB single subjects design with 4 severely or profoundly mentally retarded individuals who currently display self-injurious behavior.

Before observation or treatment sessions, data determining preferred reinforcers for each individual would be determined by presenting various possible reinforcers to each subject for 20 trials per reinforcer. If the subject held or viewed the object for at least 5 seconds during at least 3 of the trials it would be considered a preferred reinforcer for that subject.

The following conditions would be constructed for the ABAB design: Without Treatment I; With Treatment I; Without Treatment II; and With Treatment II. The Without Treatment I condition would consist of observation sessions lasting 30 minutes per day for 10 days. Data would be collected on frequency and severity, using a scale with 1 as low and 5 as high, of the targeted self-injurious behavior. The data would yield baseline rates of behavior. During the Without Treatment I condition the subject would be placed in an isolated room with a caretaker and would be observed by another individuals through an observation window.

The With Treatment I condition would consist of treatment sessions lasting 30 minutes per session per day for 20 days. During the With Treatment conditions, data would again be collected on frequency and severity of the targeted self-injurious behavior. Each subject would be placed in the same isolated room as in the Without Treatment I condition with the same caretaker and would be observed by the same individual as in the Without Treatment condition throughout the observation.

Although this study will look directly at reducing the frequency of self-injurious behavior, it would be beneficial to look at the severity of the self-injurious behavior to further determine if structuring an individual's environment with easy access to preferred reinforcers significantly reduces self-injurious behavior in these individuals. It is possible that the frequency level of a behavior might continue at near baseline rate but the severity level of the self-injurious behavior would decrease. An average of overall severity for each training session, both with and without treatment, would be calculated. The severity averages between the baseline data and the other treatment conditions would be compared to determine if a reduction in the severity of the self-injurious behavior had occurred. A 20% decrease in the severity averages between the baseline data and the final With Treatment II condition would be necessary to consider the decrease significant.

A significant decrease in either the frequency or severity would support the hypothesis that structuring a severely or profoundly mentally retarded individual's environment with preferred reinforcers significantly reduces self-injurious behavior. The data would have to be taken with caution due to the low number of subjects.

Altmeyer, B.K., Locke, B.J., Griffin, J.D., Rickettes, R.W., Williams, D.E., Mason, M., & Stark, M.T. (1987).

Treatment strategies for self-injurious behavior in a large service-delivery network. American Journal of Mental Deficiency, 7, 333-340.

Ball, T.S., Datta, P.C., Rios, M., & Constantine, C. (1985). Flexible arm splints in the control of a lesch-nyahn victim's finger biting and a profoundly retarded client's finger sucking. Journal of Autism and Developmental Disorders, 15, 177-184.

Barron, J., & Sandman, C.A. (1983). Relationship of sedative-hypnotic response to self-injurious behavior and stereotypy by mentally retarded clients. American Journal of Mental Deficiency, 88, 177-186.

Barton, L.E., & Lagrow, S.J. (1983). Reducing self-injurious and aggressive behavior in deaf-blind persons through overcorrection. Journal of Visual Impairment and Blindness, 71, 421-424.

Davidson, P.W. Kleene, B.M., Carroll, M., & Rockowitz, R.J. (1983). Effects of naloxone on self-injurious behavior: a case study. Applied Research in Mental Retardation, 4, 1-11.

Dorsey, M.F., Iwata, B.A., Reid, D.H., & Davis, P.A. (1982). Protective equipment: continuous and contingent application in the treatment of self-injurious behavior. Journal of Applied Behavior Analysis, 15, 217-230.

Duker, P.C., Druenen, C., Jol, K., Oud, H. (1986).

Determinants of maladaptive behavior of institutionalized mentally retarded individuals. American Journal of Mental Deficiency, 91, 51-56.

Freschi, D.F., & DeLeo, P.D. (1982). Treatment of self-abusive behaviors using positive intervention with an autistic boy. Exceptional Child, 49, 77-78.

Gaylord-Ross, R.J., Weeks, M., Lipner, C., Gaylord-Ross, C. (1983). The differential effectiveness of four treatment procedures in suppressing self-injurious behavior among severely handicapped students. Education and Training of the Mentally Retarded, 18, 38-44.

Griffin, J.C., Williams, D.E., Stark, M.T., Altmeyer, B.K., & Mason, M. (1986). Self-injurious behavior: a state-wide prevalence survey of the extent and circumstances. Applied Research in Mental Retardation, 7, 105-116.

Halpern, L.F. & Andrasik, L. (1986). The immediate and long term effectiveness of overcorrection in treating self-injurious behavior in mentally retarded adult. Applied Research in Mental Retardation, 7, 59-65.

Hamad, C.D., Isley, E., & Lowry, M. (1983). The use of mechanical restraint and response incompatibility to modify self-injurious behavior; a case study. Mental Retardation, 21, 213-217.

Hill, B.K., & Bruininks, R.H. (1984). Maladaptive behavior of mentally retarded individuals in residential facilities. American Journal of Mental Deficiency, 88,

- Luiselli, J.K., & Michaud, R.L. (1983). Behavioral treatment of aggression and self-injury in developmentally disabled, visually handicapped students. Journal of Visual Impairment and Blindness, 77, 388-392.
- Lockwood, K., & Bourland, F. (1982). Reduction of self-injurious behaviors by reinforcement and toy use. Mental Retardation, 20, 169-217.
- Rojahn, J. (1986). Self-injurious and stereotypic behavior of noninstitutionalized mentally retarded people: prevalence and classification. American Journal of Mental Deficiency, 91, 268-276.
- Rolider, A., & van Houten, R. (1987). Movement suppression time-out for undesirable behavior in psychotic and severely developmentally delayed children. Journal of Applied Behavior Analysis, 18, 275-288.
- Sandman, C.A., Datta, D.C., Barron, J., Hoehler, F.K., Williams, C., & Swanson, J.M. (1983). Naloxone attenuates self-abusive behavior in developmentally disabled clients. Applied Research in Mental Retardation, 4, 5-11.
- Schroeder, S.R., Schroeder, C.S., Rojahn, J., & Mulick, J. (1981). Self-injurious behavior: an analysis of behavior modification techniques. In J.L. Matson & J.R. McCartney (Eds.). Handbook of behavior modification with the mentally retarded. New York: Plenum Press.
- Silverman, K., Wantanabe, K., Marshall, A.M., & Baer, D.M. (1984). Reducing self-injury and corresponding

self-restraint through the strategic use of protective clothing. Journal of Applied Behavior Analysis, 17, 545-552.

Smith, M.D. (1985). Managing the aggressive and self-injurious behavior of adult's disabled by autism. Journal for the Association for Persons with Severe Handicaps, 10, 228-232.

Szymanski, L., Kedesdy, J., Sulkes, S., Cutler, A., & Stevens-Our, P. (1987). Naltrexone in treatment of self-injurious behavior: a clinical study. Research in Developmental Disabilities, 8, 179-190.

Wieseler, H.D., Hanson, R.H., Chamberlain, T.P., & Thompson, T. (1985). Functional taxonomy of stereotypic and self-injurious behavior. Mental Retardation, 23, 230-234.