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A Determination of the Effect of Sensory Diversion on the Self-Injurious Behavior Level in Two Profoundly Retarded, Multiply Handicapped Females

Lynn Lenore Johnson Scharenbroich

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A DETERMINATION OF THE EFFECT OF SENSORY DIVERSION ON THE

SELF-INJURIOUS BEHAVIOR LEVEL IN TWO PROFOUNDLY

RETARDED, MULTIPLY HANDICAPPED FEMALES

by

Lynn Lenore Johnson Scharenbroich.

B.S., St. Cloud State College, 1974

A Thesis

Submitted to the Graduate Faculty

of

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in Partial Fulfillment of the Requirements

for the Degree

Master of Science

St. Cloud, Minnesota

March, 1982

This thesis submitted by Lynn Lenore Johnson Scharenbroich in partial fulfillment of the requirements for the Degree of Master of Science at St. Cloud State University is hereby approved by the final evaluation committee.

Lynn Lenore Johnson Scharenbroich

Dealing with self-injurious behavior in the classroom is a trying problem. Often it is not possible to determine the causal factors for the behavior and steps must be taken to approach the problem from other directions.

In this study, self-injurious behavior was treated through the use of sensory diversion. The change in behavior was assessed for both increase or decrease and the relationship between duration and frequency.

Two profoundly retarded, multiply handicapped female students were observed and treated. The entire procedure was done in four parts, baseline, assessment, implementation, and return to baseline (A. B. C. A). Each phase ran until 25 instances had been recorded or a maximum of 10 days had elapsed.

Results indicated that the duration of the self-injurious behavior (determined by the assessment) was reduced both in duration and frequency. A probe done nearly a month after the implementation phase showed that when the chosen sensory diversion was in operation, the behavior remained controlled.

James Lewis Chairperson

William Lovelace

Robert Murphy

March 1982

Approved by Research Committee:

James Lewis Chairperson

Vernon P. Sudeman
Dean
School of Graduate Studies

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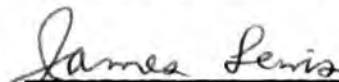
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Two profoundly retarded, multiply handicapped female students were observed and treated. The entire procedure was done in four parts, baseline, assessment, implementation, and return to baseline (A, B, B₁, A). Each phase ran until 24 instances had been recorded or a maximum of 10 days had elapsed.

Results indicated that the sensory diversion of choice (determined by the assessment) did reduce both the frequency and the duration of the self-injurious behavior in a direct relationship. A probe done nearly a month after formal programming had ceased, showed that when the chosen sensory diversion was in operation, the behavior remained controlled.

March 1982

Approved by Research Committee:


James Lewis

Chairperson

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A major part of Public Law 94-142 involves the mandate that students be programmed in the least restrictive environment. However, when EIB comes into play, it becomes extremely difficult, if not impossible, to program in anything except a restrictive environment for the safety of the student. Clearly, then, finding a means of reducing and hopefully eliminating EIB is a high priority for the placement teacher.

Educators have found their pathway to discovering such means to be very narrow. It is not uncommon to find hypotheses on the evolution of EIB in particular cases (Frankel & Simone, 1976), or presently held beliefs about EIB (Garr, 1977), but rarely do they encounter a useful tool for classroom implementation. However, DuBoise, Langley, and Stager (1977) state that a profoundly handicapped

Chapter I

INTRODUCTION

Since the implementation of Public Law 94-142, which requires that every child be given the advantage of an education, teachers have been faced with a myriad of complex programming problems. One very difficult problem encountered by the teachers of profoundly handicapped learners is that of self-injurious behavior (SIB). This is a problem for educators, parents, and surrogate parents.

A major part of Public Law 94-142 involves the mandate that students be programmed in the least restrictive environment. However, when SIB comes into play, it becomes extremely difficult, if not impossible, to program in anything except a restrictive environment for the safety of the student. Clearly, then, finding a means of reducing and hopefully eliminating SIB is a high priority for the classroom teacher.

Educators have found their pathway to discovering such means to be very narrow. It is not uncommon to find hypotheses on the evolution of SIB in particular cases (Frankel & Simmons, 1976), or presently held beliefs about SIB (Carr, 1977), but rarely do they encounter a useful tool for classroom implementation. However, DuBose, Langley, and Stagg (1977) state that a profoundly handicapped

child who refuses to comply with task demands and is physically abusive to self and others must first undergo behavior management training.

There is clearly a need for research on the problem of self-injurious behavior to determine which techniques will best serve the classroom teacher who is striving to successfully reduce SIB in students, thereby redirecting students' energies into obtaining skills to enhance their independent or semi-independent living abilities.

Definition of Terms

Profoundly multiply handicapped. Those individuals who are not toilet trained, aggress toward others, do not attend to even the most pronounced social stimuli, self-mutilate, ruminate, self-stimulate, do not walk, speak, hear, or see, manifest durable and intense temper tantrums, are not under even rudimentary forms of verbal control, do not imitate, manifest minimally controlled seizures, and/or have extremely brittle medical existences (Sontag, Burke, & York, 1973, p. 21).

Self-injurious behavior. Any of a number of behaviors by which the individual produces physical damage to his or her own body is termed self-injurious behavior. Such behaviors may be discernably provoked or may be due to undeterminable causes. For purposes of this study, self-injurious behavior will refer to any instance of hand or arm biting, slapping of the face or head, or banging against objects (Carr, 1977).

Review of the Literature

The general picture of the individual suffering from SIB tends to be a younger, long-institutionalized severely/profoundly retarded female with a medical diagnosis implying brain damage (Maisto, 1978). It is probable that due to a high incidence of visual and language disorders among such individuals, SIB becomes the avenue of communication and environmental control (Bachman, 1972). Exploration into the early life of these persons may very likely show a lack of tactile, auditory, and other stimulation which has caused the avoidance of interaction with others and the difficulty in finding positive meaning in the surrounding environment (Bigge & O'Donnell, 1976).

The etiology of SIB has been explored by many researchers. Some believe it to be the result of cold disinterest and emotional neglect by caregivers (Phillips & Alkan, 1961). This view is supported by Schroeder's more recent findings (1978) that SIB cases tended to be younger and institutionalized longer than the non-SIB retarded population. It seems reasonable that upon extended confinement to the institutional setting, with continuous changing of caregivers and subsequent lack of bonding between child and adult, that SIB could evolve as a bizarre means of obtaining attention (Sutton-Smith, 1973). Further, Bachman (1972) contends that SIB clients may use their SIB as a discriminative stimulus for reward. It is considered a primitive form of communication, in that it is a response that can easily be inadvertently reinforced by caregivers. This unspecified reinforcement may play a main

role in causing the SIB to persist. Such behavioral trapping was identified by Baer and Wolf (1970).

In an effort to bring together the many fragments of research regarding SIB, Carr (1977) compiled a list of five fairly common hypotheses. SIB has been considered as a learned operant behavior maintained in two ways; either by positive social reinforcement or by termination of aversive stimuli. It has also been contended that SIB could be a means of providing sensory stimulation, sometimes referred to as the self-stimulatory hypothesis. Those whose premise is based on organic causes believe it to be the product of aberrant physiological processes. Finally, other researchers maintain that SIB is an attempt to establish ego boundaries or to reduce guilt; the psychodynamic theory.

Because of this difficulty in pinning down the etiology factors of the self-injurious behavior in the institutionalized profoundly retarded, and because most extreme cases occur among the profoundly retarded (Maisto, 1978), efforts have been made toward treating the existing condition within the existing environment. Establishing clinical control first, with therapeutic change avenues implemented after this establishment, appeared to be a workable intervention method reported by Singh, Dawson, and Gregory (1980). Their premise that most treatments for SIB are highly situation-specific with limited duration of suppression caused them to promote the use of more reinforcing activities designed for the individual once suppression of SIB was achieved. Thus, the individual would conceivably be drawn into more acceptable behaviors, thereby

potentially increasing his chances for generalized suppression.

Many other approaches appeared whose foundations were not built on causal factors of SIB. Several treatment programs involved the use of overcorrection. Interestingly, only one (Kelly, 1977) saw the treatment program as it relates to the total scope of daily caregiving activities. He asserts that greater attention should be given to issues such as staff response, cost, and implementation factors, since these are the components which may make even effective treatments impractical.

Other forms of treatment for SIB included the use of a vibrator on a non-ambulatory, profoundly retarded female who could not see, hear, or speak. This procedure, used by Fischer (1979), yielded results showing electric vibration to be a possible powerful reinforcer for sensorially impaired individuals who exhibit SIB.

Informal ignoring procedures have been attempted in the past, but the procedures have been questioned on an ethical basis due to the candid possibility of severe injury to the individual if left to his own designs. Differential reinforcement of other behaviors has also been used; that is, behaviors which are not the target behavior (SIB) are reinforced (Luiselli, 1978).

Physical restraint is perhaps the most commonly used means of treatment by direct caregivers. Monitoring of restraint situations has shown that the use of physical restraint often takes on a reinforcing property such that the individual exhibits SIB immediately upon release from restraints just to obtain replacement of that condition. This unanticipated behavior generated a need for

further exploration (Friedin, 1977). Favell, McGimsey, and Jones (1978) began to pursue this circumstance, and as recently as this year (Favell, McGimsey, Jones & Cannon, 1981) determined that physical restraint can definitely be a reinforcing condition for approximately 12 percent of those individuals for whom it is intended as a punisher. They point out that this reinforcing property may account for the relative lack of success of non-aversive programs since they are often used in conjunction with restraint. They further impress their belief that there is always a need to analyze the function of any generally applied technique, rather than assuming similar functions with all individuals.

SIB cases have also come under treatment programs whose regard is for the sensory input they supply. A possible effective, yet ethically uncertain, approach is that of suppression of SIB through contingent inhalation of aromatic ammonia (Baumeister, 1978). Although suppression is rapid, general, and durable, the experimenter urges caution in administering such a program because of the presently unknown long-range medical repercussions. Another approach has been in the tactile arena where the use of structured, graded tactile stimulation served as an effective treatment for SIB in a nine year old mentally retarded boy (Lemke, 1974).

The cited research indicates that while determining causes of SIB in profoundly retarded individuals is an impractical avenue of pursuit, there are a variety of clinical approaches which have yielded evidence to support their continued implementation. Implied by nearly all the researchers was the conviction that because every

individual case is surrounded by circumstances and conditions peculiar to itself, every effort must be made to tailor treatment plans to meet these specific situations.

Purpose of the Study

The present study was designed to assess the duration of self-injurious behavior episodes in two profoundly multiply handicapped students with regard to its increase or decrease when diverted by three independently administered sensory stimulations. Further, the study was to determine the relationship between duration and frequency under the sensory diversion condition of choice.

Wendy was 14 years old and had lived at a residential facility since age 1. Her parents were both living and she had one sister who was of normal intelligence. There were no abnormalities detected during her birth or directly after. Wendy sustained an acute skull fracture when she was reported to have tumbled off a couch at three weeks of age. The injury resulted in cerebral contusion and cerebral edema causing temporary encephalitis of the left parietal region of the brain.

At the time of her birth, Wendy's mother was 17 and had completed the tenth grade. Her father was 22 and had completed the twelfth grade. Wendy was given tests in 1975 to determine her intelligence and social activity. The Wechsler Intelligence Test yielded a mental age of approximately 1 year with an IQ of 12.

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Chapter II

METHOD

Subjects

The two subjects were selected from a self-contained special education classroom operated by a public school system. Both individuals lived in an institution and both were profoundly retarded with a profound level of deviation from adaptive behavior skill (MDPS scores—Rita: 149 out of 320/short form, Wendy: 434 out of 1440/long form).

Wendy was 14 years old and had lived at a residential facility since age 3. Her parents were both living and she had one sister who was of normal intelligence. There were no abnormalities detected during her birth or directly after. Wendy sustained an acute skull fracture when she was reported to have rolled off a couch at three weeks of age. The injury resulted in cerebral contusion and cerebral adema causing temporary hydrocephalus of the left parietal region of the brain.

At the time of her birth, Wendy's mother was 19 and had completed the tenth grade. Her father was 22 and had completed the twelfth grade. Wendy was given tests in 1975 to determine her intelligence and social maturity. The Kuhlmann Intelligence Test yielded a mental age of approximately 4 months with an IQ of 12.

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The Vineland Social Maturity Scale showed her functioning at about 9 months. However, when this same test was readministered in May, 1981, she had fallen to a 6-7 month functioning level. Wendy has grand mal (tonic clonic) seizures on about a monthly basis. She has been diagnosed as cerebral palsied, mentally retarded, and epileptic. Just this year her family relinquished all parental rights and responsibilities for her.

Rita was 24 years old and had lived at a residential facility since age 8. Her parents and a younger sister were living. A younger brother was deceased. Rita's development was normal up to 3 months of age. At this time she began regressing and doctors informed her parents that she had a patchy cerebral dysgenesis, which is a brain disease. She remained at home, but was non-ambulatory and became difficult to maneuver and feed. Finally, her mother's ill health caused the family to place Rita in an institution; a decision which caused her family great distress. For the sake of Rita's mother's mental health, there were no family visits until years later when Rita was 22 years old. The visitations resumed following the unexpected death of Rita's brother. From the date of her institutionalization, Rita's IQ score dropped from 27 to 15 (change possibly due to the larger chronological age number). Rita was expected to remain in a total care facility for the balance of her lifetime.

These two students were selected because both exhibit frequent disruptive self-injurious behavior patterns. They present further problems because neither student demonstrates definite likes of any

kind, making the likelihood of finding a successful reinforcer very low. These observations have been made by caregiving staff as well as classroom staff.

Rationale for Modality Choices

All modalities used (auditory, tactile, and olfactory) involved a diversion from the environmental conditions which resulted in the self-injurious behavior. The three sensory modalities have within them stimulations which are not aversive. Since it is extremely difficult, if not impossible, to determine a reinforcer for either student, this experimenter preferred to try diverting their attention from the prevailing situation to an entirely new stimulus.

Additionally, within the auditory domain, it is known that perception of pitch is present in the newborn child (Leventhal & Lipsitt, 1964), as is perception of sound duration (Keen, Chase, & Graham, 1965), and rhythm (Grier, Counter, & Shearer, 1967). Engen and Lipsitt (1965) have demonstrated that olfactory perception, or awareness of smells, is also present in the newborn. Similarly, reaction to touch, or tactile perception, appears in the neonate (Schaffer & Emerson, 1964). Since reactions to all these forms of stimuli have been proven to be present at a newborn functioning level, one is relatively assured that there will be a brain transmission of an activity occurring, regardless of the actual functioning level of these two students.

Setting

Both students attended public school from 7:15 a.m. until 12:15 p.m. They were returned to their living units at that time for 40 minutes of rest time. At 1:00 p.m., the students again returned to school for one hour of group activity. This afternoon session was generally a leisure/recreation/arts type of activity as opposed to the intense one-to-one working situations in the morning. Each student spent a total of six hours in school programming. The classroom for these students was on the first floor in a residential building on the campus of an institution. They were part of a class of seven students with a total of four staff.

Morning goal work was concentrated in the areas of gross and fine motor training, communication and socialization skills, self-help training and some rudimentary attending skills. All goals were monitored and recorded by the responsible staff each day on 5" x 7" goal cards.

Prior to the implementation of this study, a differential reinforcement of interfering behavior (DRI) was in effect on 15 minute intervals. Each reinforcement was verbal praise. That aspect was still in operation at the onset of this experiment, and continued throughout the study.

Recording

All programming data was recorded by the staff within the classroom. This experimenter instructed the staff on the exact procedure outlined in the Procedure Section of the diversion plan.

Reliability

Adherence to specified procedure and reliability of data collection was monitored simultaneously by the occupational therapist on staff with the public school. There was at least one time during each phase that a check was made. Checks were made on both students' diversion programs. Each check covered at least five episodes of SIB.

Within the classroom, three teacher's aides and the teacher were the primary observers. All aides and the occupational therapist were trained in the specific procedure. The teacher was the experimenter. All personnel were familiar with both students' behaviors. Each of the primary observers was responsible for certain periods of time throughout the day. This pattern was followed to lessen the effect of a particular observer's tendency to over or under rate behavior (Hersen & Barlow, 1976).

There was a practice session for all persons involved in treating the two students. Observers were provided with an opportunity to record a 'dummy' student and the individual responsible for reliability checks took comparison data. Inter-observer reliability was checked at this time also.

Reliability was computed by dividing the number of episodes recorded as the same duration by the total number of episodes recorded the same plus those recorded differently during each check and multiplied by 100. (Acceptable range was 75-100 percent agreement.)

Design

A combination of multiple component and ABA design was used in this experiment. The 'A' phase was the baseline period to determine the frequency of SIB and the duration of each instance. Baseline data was collected until 24 instances were recorded, or a maximum of 10 days of baselining was completed. The 'B' phase (multiple component portion) was the assessment which ran until 24 instances of SIB were recorded. Instances of SIB number 1, 4, 7, 10, 13, 16, 19, 22 were interrupted by auditory stimulation. Instances of SIB number 2, 5, 8, 11, 14, 17, 20, 23 were interrupted by tactile stimulation. Instances of SIB number 3, 6, 9, 12, 15, 18, 21, 24 were interrupted by olfactory stimulation. The 'B₁' phase was the implementation then, which focused on the modality which best interrupted the behavior. This stimulation was used each time SIB was exhibited and ran until 24 instances were recorded. Data was collected with regard to frequency and duration. Following the 'B₁' phase, was a return to baseline conditions until 24 instances were recorded or a maximum of 10 days.

A probe was then administered one month after the return to baseline to determine whether the sensory diversion retained its usefulness. The probe was run for no longer than two school days.

The ABA design had its roots in the clinical case studies and application of quasi-experimental designs done by Campbell and Stanley (1966). This type of design allowed for an analysis of the controlling effects of the treatment since it revealed both introduction and withdrawal trends. This was an improvement over the

basic A-B design which yielded only tentative conclusions about a treatment's influence. Although ABA designs have undergone criticism for not exercising control over multiple treatments and resulting sequential confounding, their results continue to carry credence as they are replicated on different subjects. A further criticism of ABA is the fact that the design ends in a non-treatment phase.

Despite the criticisms, ABA design is accepted as a useful research tool especially when there is a time factor involved or pressing medical aspects to a case (Hersen & Barlow, 1976, pp. 176-181).

In this study, one of the subjects was soon to move to another building outside this experimenter's control. Also, it was desirable to not disrupt the educational format for any longer than necessary in an effort to continue to comply with the IEP on each student. Therefore, since the ABA design yielded the data necessary to formulate a treatment plan, it was selected as the design of choice.

Of importance also, was the reasoning behind the 'B' (assessment) phase. Because of the inherent differences in children, and the accentuated individuality of these SIB cases, the assessment phase was deemed necessary to determine which particular modality appeared most effective in interrupting the SIB in each student's case.

Procedure

Baseline phase. Data regarding the frequency of SIB and the duration of each instance measured in seconds were collected on a chart (see Appendix A). The baseline ran until 24 instances of SIB were recorded, or a maximum of 10 days. Each phase of this study was independently replicated, with Rita being the first to be engaged. No task requests were made of either student during the baseline, and behavior was monitored only during the school day.

Assessment phase. The student's behavior was again monitored only during the school day. This phase also ran until 24 instances of SIB had been assessed, or a maximum of 10 days. Frequency and duration data continued to be taken (see Appendix B).

Instances 1, 4, 7, 10, 13, 16, 19, 22 were interrupted through the use of auditory stimulation. Five specific stimuli (tribal screaming, windstorm, bell tones, quiet humming, and laughter) were presented to the student within a 10 second span. Following the 10 seconds of stimulation, the student was observed for 5 seconds. If, after 5 seconds, no SIB occurred, the behavior was recorded as ceased. If, after 5 seconds, the behavior was still persisting or it had recurred, it was recorded as continued.

Instances 2, 5, 8, 11, 14, 17, 20, 23 were interrupted through the use of tactile stimulation. Five specific stimuli (vibration, hair brush bristles, soft fur, wet oats, and head massage) were presented to the student within a 10 second span. (With the exception of head massage, all tactile stimulation was done on the

hands and/or arms.) Following the 10 seconds of stimulation, the student was observed for 5 seconds. If, after 5 seconds, no SIB occurred, the behavior was recorded as ceased. If, after 5 seconds, it still persisted or recurred, it was recorded as continued.

Instances 3, 6, 9, 12, 15, 18, 21, 24 were interrupted through the use of olfactory stimulation. Five specific stimuli (liquid smoke, garlic, Vicks menthol creme, perfume, and Limberger cheese) were presented to the student within a 10 second span. Following the 10 seconds of stimulation, the student was observed for 5 seconds. If, after 5 seconds, no SIB occurred, the behavior was recorded as ceased. If, after 5 seconds, it still persisted or recurred, it was recorded as continued.

No task requests were made of either student during this phase.

Implementation phase. That modality, which through assessment, appeared to most effectively divert the student from her SIB was employed during the school day for each instance of SIB. Regular task requests were not made of either student during this phase. Data was gathered on continued or ceased SIB, with careful attention paid to the frequency of SIB and the duration of each instance. This phase ran until 24 instances were recorded, or a maximum of 10 days (see Appendix C).

Return to baseline phase. Once again, no task requests were made of either student. Similarly, no sensory diversion was employed

when SIB emerged. Data was collected with regard to frequency and duration of SIB and again ran until 24 instances had been recorded, or a maximum of 10 days. During this phase, data revealed the controlling effects of the sensory diversion (see Appendix D).

Duration of self-injurious episodes in two profoundly multiply handicapped subjects was assessed with regard to its increase or decrease when diverted by three independently administered stimuli. Additionally, the relationship between duration and frequency under the sensory diversion condition of choice was assessed.

Target Behavior (Bite)

The level of duration of self-injurious instances for Bite declined quite rapidly once she began the implementation of R₁ phase. She baselined at a mean of 23 seconds. In comparison, her longest episode during implementation was 1 second, and this was an isolated occurrence. All the rest ceased immediately showing only 1 second duration. Her diversion of choice was the battery of olfactory stimuli. This was determined by comparing the means from the re-assessment phase. They revealed that tactile stimulation yielded a 19.75 mean, auditory stimulation yielded a 16.2 mean, and olfactory stimulation yielded an 11.5 mean. These results are graphically displayed in Figure 1.

It bears re-emphasizing here that no tick requests were made during any of the experimental phases in an effort to rule out

Chapter III

RESULTS

Duration of self-injurious episodes in two profoundly multiply handicapped students was assessed with regard to its increase or decrease when diverted by three independently administered stimulations. Additionally, the relationship between duration and frequency under the sensory diversion condition of choice was screened.

Target Behavior (Rita)

The level of duration of self-injurious instances for Rita declined quite rapidly once she began the implementation or 'B₁' phase. She baselined at a mean of 33 seconds. In comparison, her longest episode during implementation was 3 seconds, and this was an isolated occurrence. All the rest ceased immediately showing only 1 second duration. Her diversion of choice was the battery of olfactory stimuli. This was determined by comparing the means from the assessment phase. They revealed that tactile stimulation yielded a 49.75 mean, auditory stimulation yielded a 16.1 mean, and olfactory stimulation yielded an 11.5 mean. These results are graphically displayed in Figure 1.

It bears re-emphasizing here that no task requests were made during any of the experimental phases in an effort to rule out

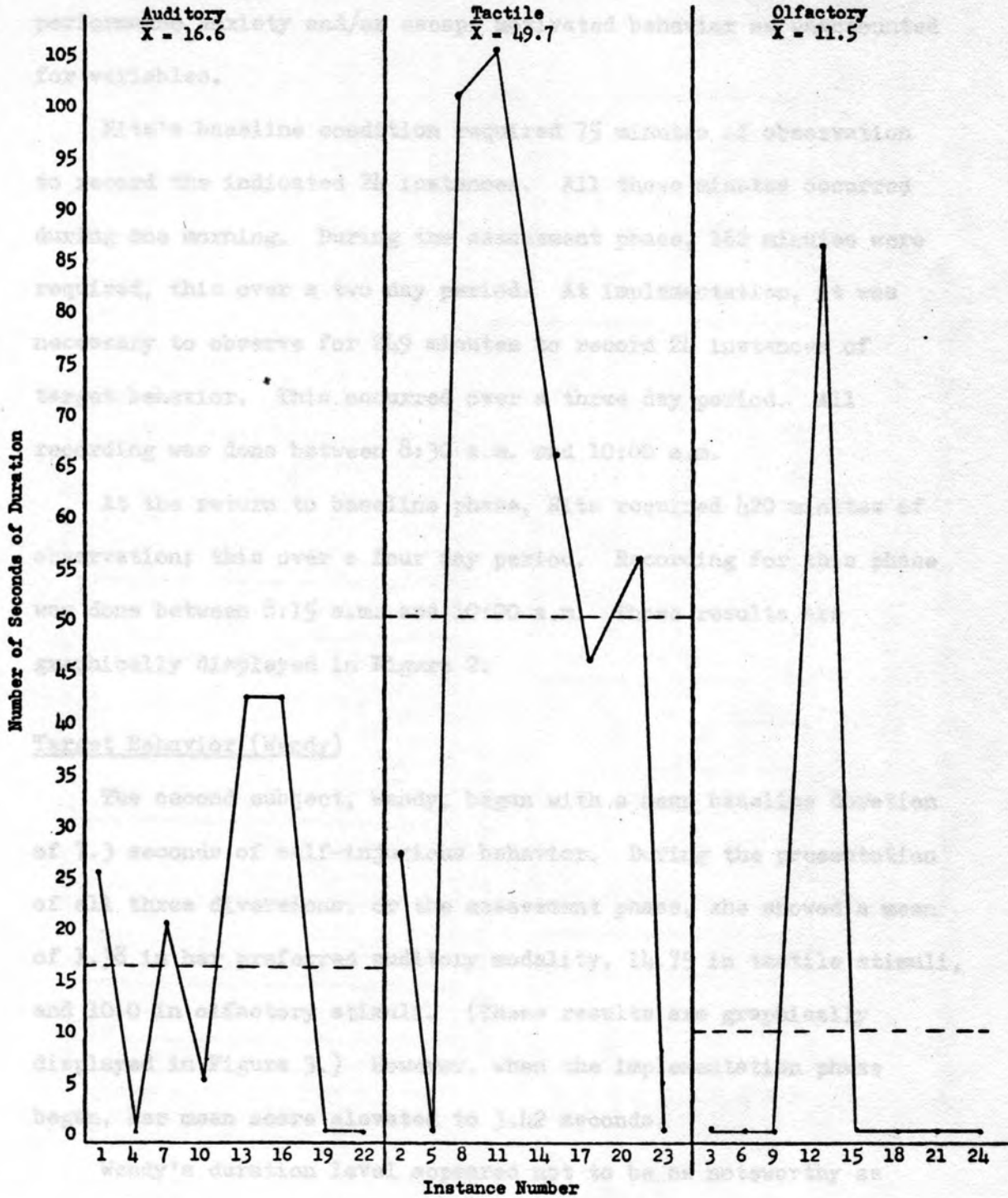


Figure 1

Assessed Modality Choices for First Subject, Rita

performance anxiety and/or escape motivated behavior as unaccounted for variables.

Rita's baseline condition required 75 minutes of observation to record the indicated 24 instances. All these minutes occurred during one morning. During the assessment phase, 162 minutes were required, this over a two day period. At implementation, it was necessary to observe for 249 minutes to record 24 instances of target behavior. This occurred over a three day period. All recording was done between 8:30 a.m. and 10:00 a.m.

At the return to baseline phase, Rita required 420 minutes of observation; this over a four day period. Recording for this phase was done between 8:15 a.m. and 10:00 a.m. These results are graphically displayed in Figure 2.

Target Behavior (Wendy)

The second subject, Wendy, began with a mean baseline duration of 7.3 seconds of self-injurious behavior. During the presentation of all three diversions, or the assessment phase, she showed a mean of 1.38 in her preferred auditory modality, 14.75 in tactile stimuli, and 10.0 in olfactory stimuli. (These results are graphically displayed in Figure 3.) However, when the implementation phase began, her mean score elevated to 3.42 seconds.

Wendy's duration level appeared not to be as noteworthy as her frequency level. Her entire series of 24 instances required only 71 minutes of observation during the baseline phase. This occurred in one morning. During the assessment phase, she required 62 minutes

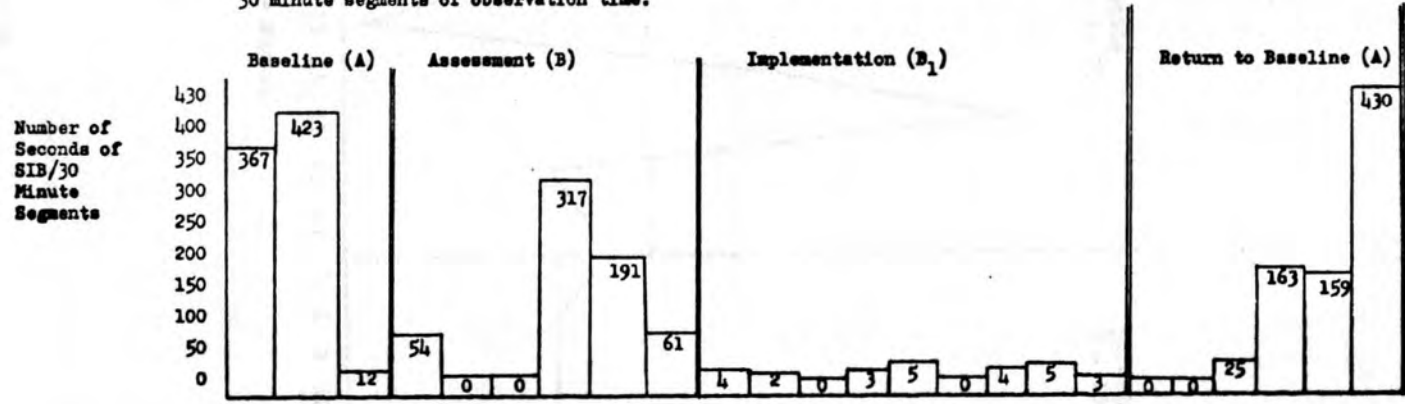
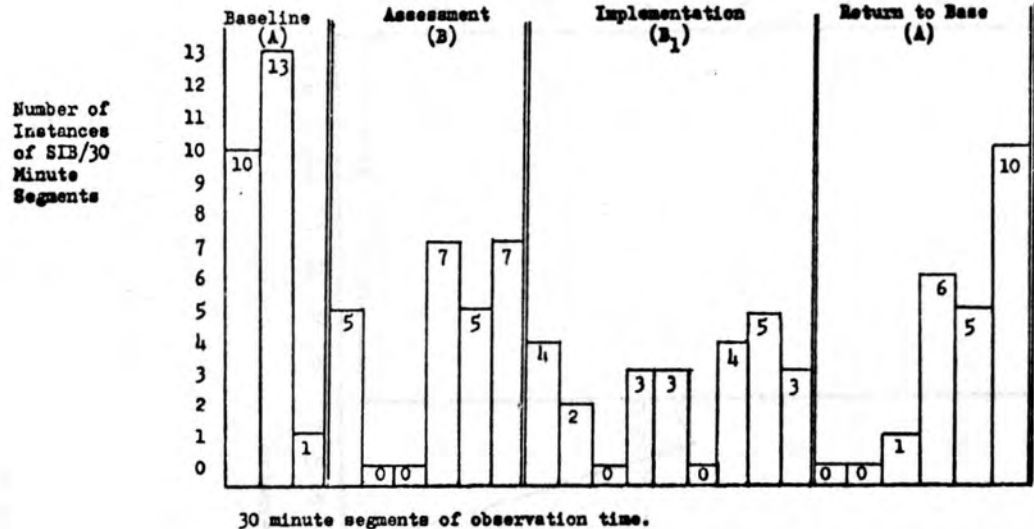
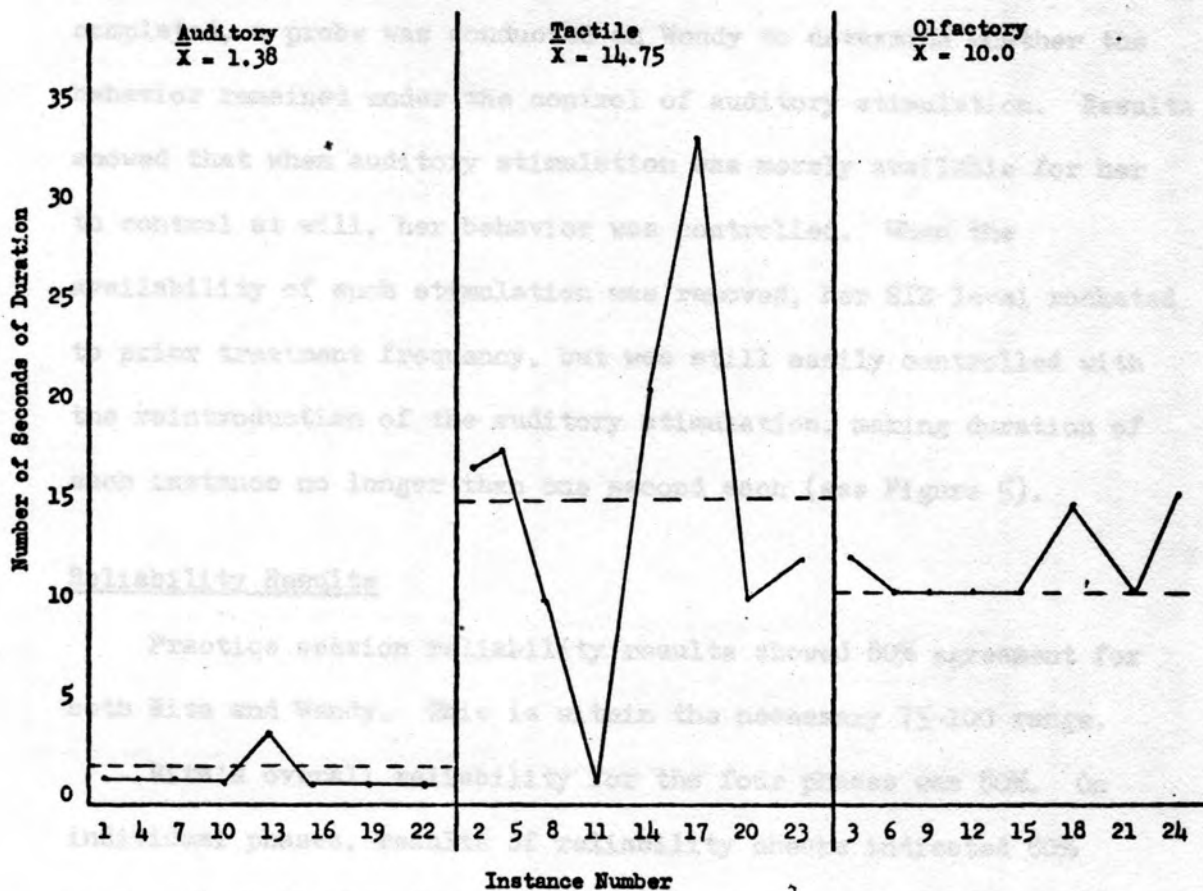


Figure 2

Comparison of Frequency and Duration Data on First Subject, Rita

of observations all in one morning. During the implementation phase, however, three days of observation were required to obtain the necessary 24 instances. The total amount of time observed was 350 minutes. All recording was done between 8:15 a.m. and 11:00 a.m. These results are graphically displayed in Figure 4.

One month after the collection of her progress data had been



agreement on the baseline phase, 83% on the assessment phase, 83% on the implementation phase, and 100% on the return to baseline phase (see Appendix B).

Wendy's overall reliability was measured at 90%. On her individual phases, percent agreement was as follows: 83% on

Figure 3
Assessed Modality Choices for Second Subject, Wendy

of observation; all in one morning. During the implementation phase, however, three days of observation were required to obtain the necessary 24 instances. The total amount of time observed was 354 minutes. All recording was done between 8:15 a.m. and 11:00 a.m. These results are graphically displayed in Figure 4.

One month after the collection of her program data had been completed, a probe was conducted on Wendy to determine whether the behavior remained under the control of auditory stimulation. Results showed that when auditory stimulation was merely available for her to control at will, her behavior was controlled. When the availability of such stimulation was removed, her SIB level rocketed to prior treatment frequency, but was still easily controlled with the reintroduction of the auditory stimulation, making duration of each instance no longer than one second each (see Figure 5).

Reliability Results

Practice session reliability results showed 80% agreement for both Rita and Wendy. This is within the necessary 75-100 range.

Rita's overall reliability for the four phases was 80%. On individual phases, results of reliability checks indicated 80% agreement on the baseline phase, 60% on the assessment phase, 80% on the implementation phase, and 100% on the return to baseline phase (see Appendix E).

Wendy's overall reliability was measured at 90%. On her individual phases, percent of agreement was as follows: 90% on

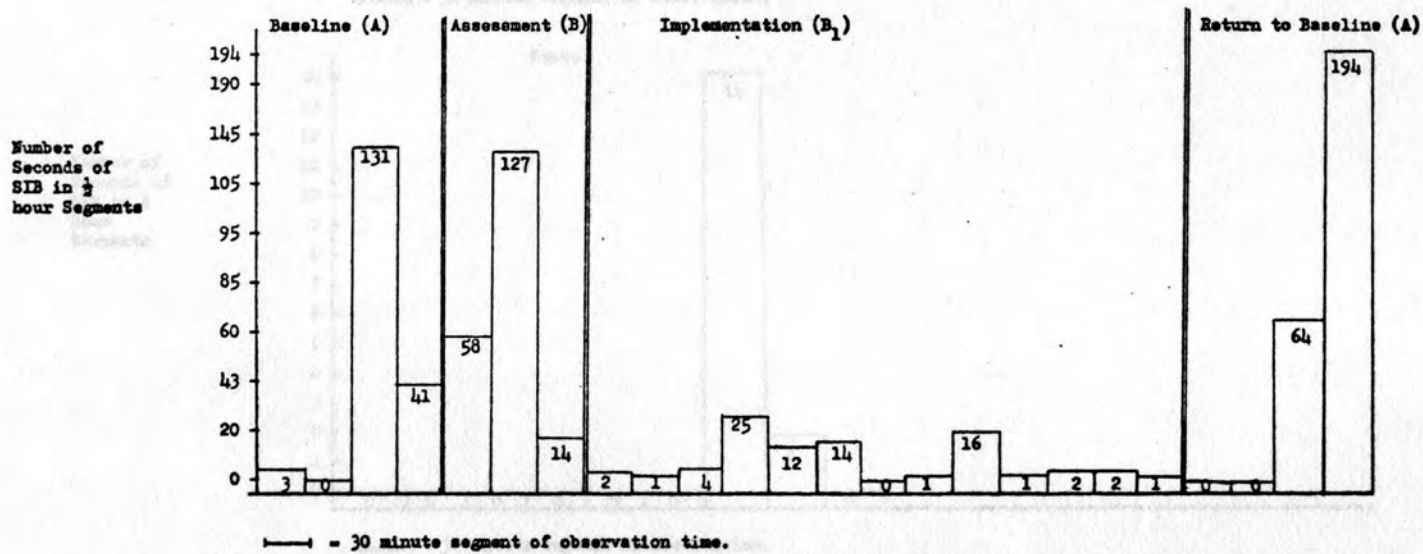
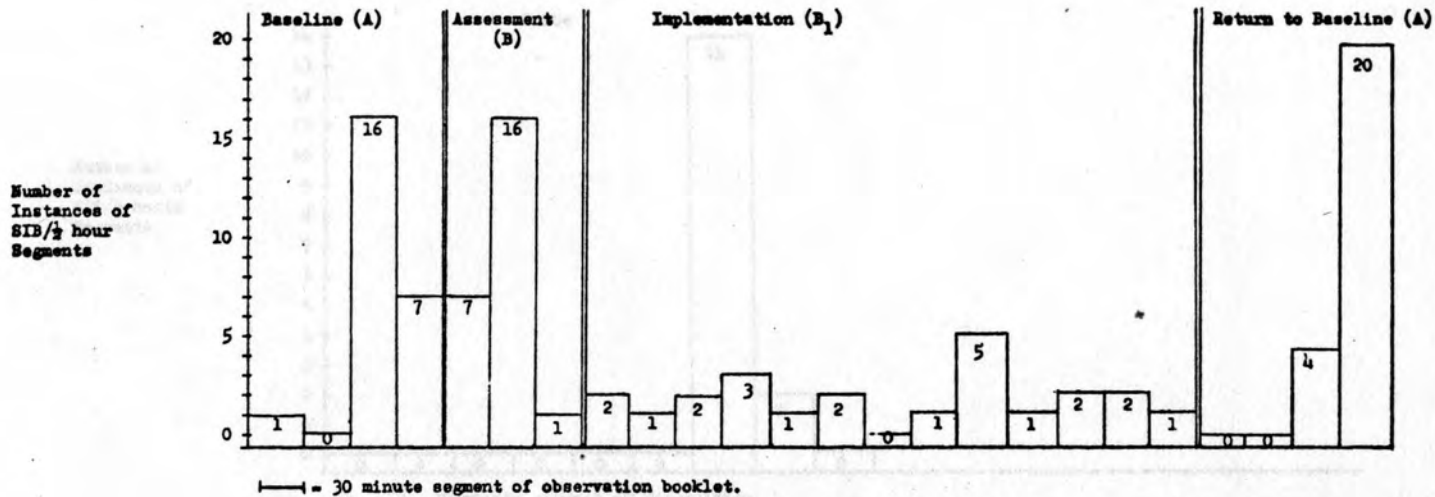
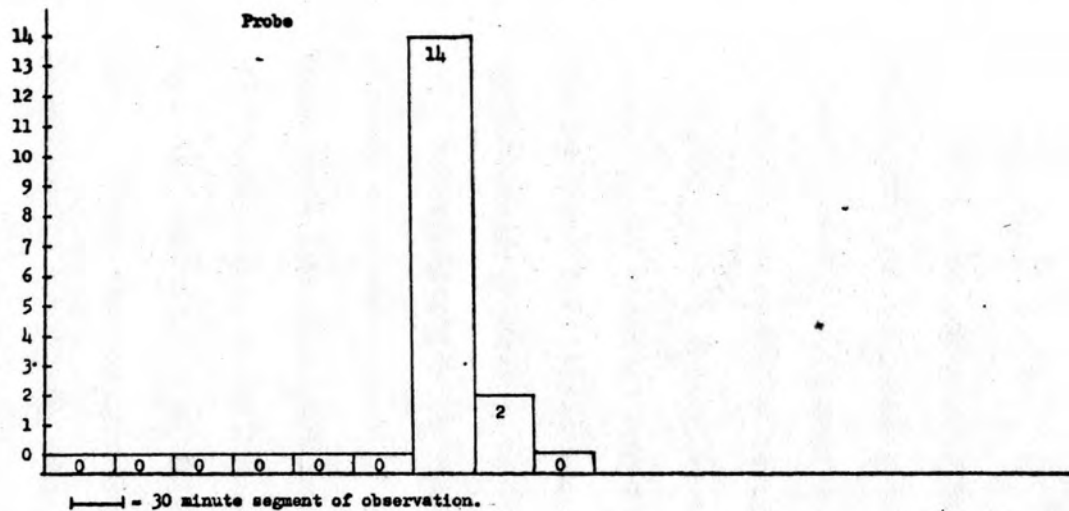


Figure 4

Comparison of Frequency and Duration Data on Second Subject, Wendy

Number of
Instances of
SIB/½ hours
Segments



Number of
Seconds of
SIB in ½
hour
Segments

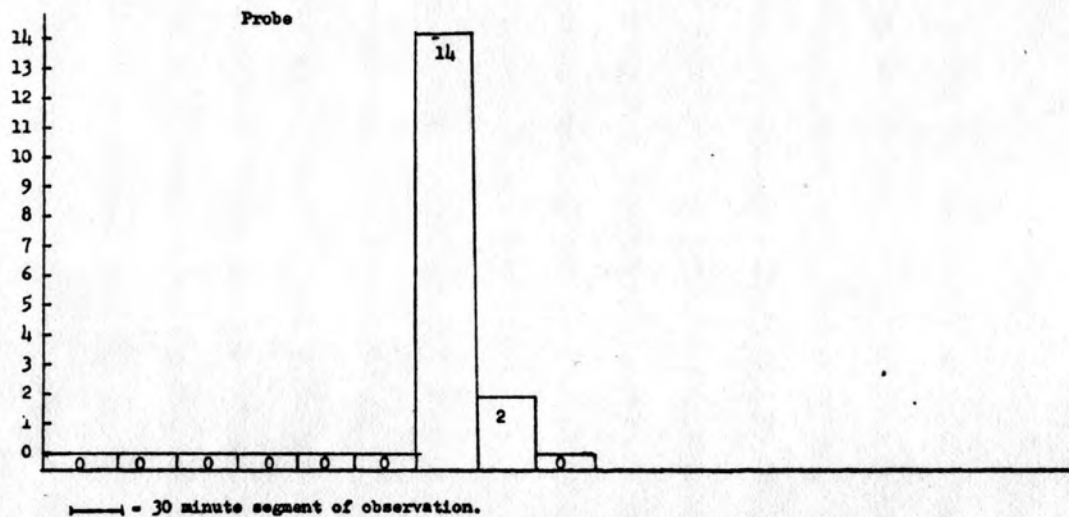


Figure 5

Behavioral Probe on Second Subject, Wendy

baseline, 100% on assessment, 100% on implementation, 80% on return to baseline (see Appendix E).

CHAPTER IV

DISCUSSION

The first purpose of this study was to assess the duration of self-injurious behavior episodes in two profoundly multiply handicapped students with regard to its increase or decrease when diverted by three independently administered sensory stimulations. Further, the study was to determine the relationship between duration and frequency of episodes under the sensory diversion condition of choice. The students considered were both attending public school in a self-contained setting.

The application of this diversion procedure did show a clear reduction in the amount of seconds each child engaged in SIB. Rita's results were particularly significant. Her baseline mean was 33 seconds of self-injurious behavior. When the assessment phase data was studied, it revealed an 11.5 mean in her preferred stimulus area. Then, the implementation phase reduced her SIB duration level even more to a very acceptable 1 second mean. Upon return to baseline conditions, Rita's mean duration level again went up to 14.8 seconds. For this child, the sensory diversion created a situation where teaching could now take place. There was no longer the interfering self-injurious behavior to preclude teaching efforts. Although still present, the level did not prevent a progressing

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Chapter IV

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problem.

In Rita's case, since the reduced duration again accelerated when the diversion was removed, it seemed fairly conclusive that the diversion was, in fact, the component causing this change. The effect of the diversion on the frequency of the behavior needs to be examined. The trend is quite unexpected. Rita's baseline observations required 75 minutes, all obtained in one morning. As the experiment continued, each phase required greater amounts of observation time, going to 162 minutes for the assessment phase, 249 minutes for the implementation phase, and all the way up to 420 minutes for return to baseline; this taking 4 days to gather.

Deciphering of this data without knowing this child would be difficult. Because of the familiarity with her case, it was determined that for her such a trend should not be considered unusual. She often becomes reluctant to pursue a course that has been interfered with by outside forces. An example of this is found in her food scooping behavior. When she was given an open-handled spoon to grasp allowing staff finger to insert into the opening and guide her, she would not scoop. However, if no interference was made for some time, she would again begin to scoop. This method of behavior must have spilled over into the negative realm of self-injury also, so that whenever her SIB is interfered with, she waits a long time before exhibiting it again. The important fact is that she does exhibit the behavior again. While in the case of food scooping, recurrent behavior is desired, in this case it is not. Speculation based on this phenomenon would indicate that if the SIB

continues to be interrupted, it may extinguish itself through Rita's own behavior pattern. The diversion idea appeared to be an unexpectedly wise approach in her case.

Wendy began the experiment with a lower duration level than Rita. Her baseline mean was 7.3 seconds of self-injury per episode. During the assessment phase, Wendy's duration level fell to 1.38 in her preferred stimulus area. A slight increase was demonstrated during the implementation phase when the mean increased to 3.42 seconds. At the return to baseline phase, she was back up to 10.75 seconds mean. Although this change was not as dramatic as Rita's, it nonetheless, again showed clearly that the diversion was effective. The frequency of Wendy's behavior was interesting. Her baseline phase required 71 minutes of observation all recorded in one morning. Similarly, her assessment phase required one morning for the 62 minutes it took. But, when the implementation phase was started, it was as though Wendy suddenly realized something different was happening when she came to school. Because this was the second day that no one had taken her out of her wheelchair and set up the goal table, she became suspicious. She observed the experimenters as closely as they observed her. In fact, by episode #4 of this phase, she had the entire set-up clearly in her mind. Since auditory stimuli was her preferred modality, the tape recorder was set up near her wheelchair and it was turned on when the SIB episode began. Wendy, after 3 normal instances of behavior, would bring her finger to her mouth, put it between her teeth, and stare at the tape recorder. The moment the button was pressed, she would remove her hand and

laugh. It took 3 days and 354 minutes of observation to obtain the necessary 24 instances. This was an outstanding event! It has caused the staff working with her to re-evaluate our own expectations for her and restyle her school program to better fit her functioning level as we now see it. Further, since her SIB can so easily be controlled, the amount of programming time lost is greatly reduced.

At return to baseline, Wendy showed a 10.75 second mean. This was slightly higher than her original baseline and required 112 minutes to gather.

After the results of Wendy's sensory diversion treatment were evaluated, it was determined that auditory stimulation should become a greater part of her life. A toybar equipped with auditorially-interesting toys and instruments were attached to her lapboard on her wheelchair. She immediately began manipulating them and would turn to this source of enjoyment when situational demands which would otherwise cause disinterest or displeasure occurred.

At the time the behavior probe was administered, Wendy had the toybar with her. The first day of observation revealed no instances of SIB. The second day, her toybar was removed for about 45 minutes. There was a dramatic increase in the frequency of her SIB. However, when auditory stimulation was presented, the SIB ceased immediately, as it had during formal programming.

Wendy's present situation is that she is now able to divert herself from unacceptable behavior. Also, she is, as a byproduct, developing her fine motor skills.

The diversion procedure used in this experiment had two factors which made it desirable. One was its built-in assessment making it tailor made for each individual case, the other was its easy implementation. The many people involved in the experiment found it not at all cumbersome or difficult to understand. Such a consideration is vital when working with paraprofessionals who do not have a great deal of behavior background on which to rely.

On the basis of this research, it is believed that the sensory avenues can be utilized in a non-aversive way to eradicate or significantly reduce the duration of self-injurious episodes in the classroom. Further, although the frequency did not appear to have a generalized relationship to duration, it was the measure which revealed the most interesting facets of the study. This experimenter believes that anyone wishing to try this diversion should also record frequency and assess that section on the basis of what is already known about a child, as in Rita's case, and on the basis of what programming changes might be indicated by results, as in Wendy's case.

REFERENCES

Anderson, R. C. & Feustel, H. W. Emotional psychology: The science of instruction and learning. New York: Holt, Rinehart and Company, 1973.

Ariss, E. M., Gottlieb, L., Rogovin, L., Wealowski, R. E., & Sahn, T. Eliminating self-injurious behavior by educative procedures. Behavior Research and Therapy, 1979, 17, 402-411.

Bachman, J. A. Self-injurious behavior: A behavioral analysis. Journal of Abnormal Psychology, 1972, 80, 214-224.

Beur, D. N. & Volf, H. N. The entry into natural construction of reinforcement. In S. Hirsman, G. Buschick, & J. Mober (Eds.), Control of human behavior. Illinois: Scott, Foresman and Company, 1970.

REFERENCES

Bumister, A. I. Suppression of repetitive self-injurious behavior by contingent inhalation of aromatic ammonia. Journal of Autism and Childhood Schizophrenia, 1978, 8, 71-77.

Bigge, J. L. & O'SConnell, P. A. Teaching individuals with physical and multiple disabilities. Columbus, Ohio: Charles E. Merrill Publishing Company, 1976.

Coer, S. G. The motivation of self-injurious behaviors: A review of some hypotheses. Psychological Bulletin, 1977, 84, 300-316.

Daker, P. S. Behavioral analysis of self-injurious behavior of the mentally retarded. Scandinavian Journal of Behavioral Therapy, 1978, 1, 185-196.

Hagen, W. & Lipsitt, L. P. Decrement and recovery of responses to olfactory stimuli in the human neonate. Journal of Child Psychology, 1965, 53, 312-316.

Payell, J., McGhiey, J., & Jones, M. The use of physical restraint in the treatment of self-injurious and self-positive reinforcement. Journal of Applied Behavioral Analysis, 1978, 11, 227-231.

Payell, J. M., McGhiey, J. F., Jones, M. L., & Dawson, P. M. Physical restraint as positive reinforcement. Journal of Mental Deficiency, 1981, 21, 111-117.

REFERENCES

- Anderson, R. C. & Faust, G. W. Educational psychology: The science of instruction and learning. New York: Dodd, Mead and Company, 1973.
- Azrin, N. H., Gottlieb, L., Hughort, L., Weslowski, M. D., & Rahn, T. Eliminating self-injurious behavior by educative procedures. Behavior Research and Theory, 1975, 13, 101-111.
- Bachman, J. A. Self-injurious behavior: A behavioral analysis. Journal of Abnormal Psychology, 1972, 80, 211-224.
- Baer, D. M. & Wolf, M. M. The entry into natural communities of reinforcement. In R. Ulrich, T. Stachnik, & J. Mabry (Eds.), Control of human behavior. Illinois: Scott, Foresman and Company, 1970.
- Baumeister, A. A. Suppression of repetitive self-injurious behavior by contingent inhalation of aromatic ammonia. Journal of Autism and Childhood Schizophrenia, 1978, 8, 71-77.
- Bigge, J. L. & O'Donnell, P. A. Teaching individuals with physical and multiple disabilities. Columbus, Ohio: Charles E. Merrill Publishing Company, 1976.
- Carr, E. G. The motivation of self-injurious behavior: A review of some hypotheses. Psychological Bulletin, 1977, 84, 800-816.
- Duker, P. C. Behavioral analysis of self-injurious behavior of the mentally retarded. Scandinavian Journal of Behavior Therapy, 1978, 7, 185-194.
- Engen, T. & Lipsitt, L. P. Decrement and recovery of responses to olfactory stimuli in the human neonate. Journal of Child Psychology, 1965, 59, 312-316.
- Favell, J., McGimsey, J., & Jones, M. The use of physical restraint in the treatment of self-injury and as positive reinforcement. Journal of Applied Behavioral Analysis, 1978, 11, 225-241.
- Favell, J. E., McGimsey, J. F., Jones, M. L., & Cannon, P. R. Physical restraint as positive reinforcement. American Journal of Mental Deficiency, 1981, 85 (4), 425-432.

- Fischer, M. The use of a vibrator to reduce self-abusive behaviors in a mentally retarded and sensorially handicapped individual. Presented at The American Psychological Association. New York, 1979.
- Frankel, F. & Simmons, J. Q. Self-injurious behavior in schizophrenic and retarded children. American Journal of Mental Deficiency, 1976, 80, 512-522.
- Friedin, B. D. Clinical issues on the physical restraint experience with self-injurious children. Research and the Retarded, 1977, 4, 1-6.
- Grier, J. B., Counter, S. A., & Shearer, W. M. Prenatal auditory imprinting in chickens. Journal of Science, 1967, 155, 1692-1693.
- Hersen, M. & Barlow, D. H. Single case experimental designs: Strategies for studying behavioral change. New York: Pergamon Press, 1976.
- Keen, R. F., Chase, H. H., & Graham, F. K. Twenty-four-hour retention by neonates of an habituated heart response. Psychoneurological Science, 1965, 2, 265-266.
- Kelly, J. A. Overcorrection: An effective procedure that failed. Journal of Clinical Child Psychology, 1977, 6 (3), 38-40.
- Lemke, H. Self-injurious behavior in the mentally retarded. American Journal of Occupational Therapy, 1974, 28 (2), 94-98.
- Leventhal, A. S. & Lipsitt, L. P. Adaptation, pitch discrimination, and sound localization in the neonate. Journal of Child Development, 1964, 35, 759-767.
- Maisto, C. R. An analysis of variables related to self-injurious behavior among institutionalized retarded persons. Journal of Mental Deficiency Research, 1978, 22, 27-36.
- Martin, G. & Pear, J. Behavior modification: What it is and how to do it. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1978.
- Niblette, R. K. Conjugate control of stereotyped body rocking in institutionalized retarded persons using auditory stimulation. Dissertation Abstracts International, 1976, 37, 2518.
- Phillips, R. H. & Alkan, M. Recurrent self-mutilation. From the Department of Psychiatry, State University of New York--Upstate Medical Center in Syracuse and Willard State Hospital, Willard, New York, 1961.

- Rose, T. Reducing self-injurious behavior by differentially reinforcing other behaviors. AAESPH Review, 1979, 4 (2), 179-186.
- Schaffer, H. R. & Emerson, P. E. Patterns of response to physical contact in early human development. Journal of Child Psychology, 1964, 5, 1-13.
- Schroeder, S. R. Prevalence of self-injurious behaviors in a large state facility for the retarded: A three year follow-up study. Journal of Autism and Childhood Schizophrenia, 1978, 8 (3), 261-269.
- Silva, D. A., Friedlander, B. Z., & Knight, M. S. Multihandicapped children's preferences for pure tones and speech stimuli as a method of assessing auditory capabilities. American Journal of Mental Deficiency, 1978, 83 (1), 29-36.
- Singh, N. N., Dawson, M. J., & Gregory, P. R. Self-injury in the profoundly retarded: Clinically significant versus therapeutic control. Journal of Mental Deficiency Research, 1980, 24, 87-97.
- Sontag, E., Burke, P., & York, R. Considerations for screening the severely handicapped in the public schools. Education and Training of the Mentally Retarded, 1973, 8 (2), 20-26.
- Sutton-Smith, B. Child psychology. New York: Appleton-Century-Crofts, 1973.

APPENDIXES

BASELINE DATA SHEET

Date	Time	Duration In Seconds	Episode Number
			1
			2
			3
			4
			5
			6
			7
			8
			9
			10
			11
			12
			13
			14
			15
			16
			17
			18
			19
			20
			21
			22
			23
			24

APPENDIX A

BASELINE DATA SHEET

BASELINE DATA SHEET

Date	Time	Duration in Seconds	Episode Number
			1
			2
			3
			4
			5
			6
			7
			8
			9
			10
			11
			12
			13
			14
			15
			16
			17
			18
			19
			20
			21
			22
			23
			24

ASSESSMENT DATA SHEET

Date	Time	Instance #	Diversion	On Presentation		Five Seconds After		Duration
				Cease	Cont.	Cease	Cont.	
		1						
		2						
		3						
		4						
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						
		19						
		20						
		21						
		22						
		23						
		24						

IMPLEMENTATION DATA SHEET

Date	Time	Instance #	No. Presentation		Five Second Effort		Duration
			Case	Cont.	Case	Cont.	
		1					
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9					
		10					
		11					
		12					
		13					
		14					
		15					
		16					
		17					
		18					
		19					
		20					
		21					
		22					
		23					
		24					
		25					

APPENDIX C

IMPLEMENTATION DATA SHEET

IMPLEMENTATION DATA SHEET

Date	Time	Instance #	On Presentation		Five Seconds After		Duration
			Cease	Cont.	Cease	Cont.	
		1					
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9					
		10					
		11					
		12					
		13					
		14					
		15					
		16					
		17					
		18					
		19					
		20					
		21					
		22					
		23					
		24					

RETURN TO BASELINE DATA SHEET

Date	Time	Duration in Seconds	Episode Number
			1
			2
			3
			4
			5
			6
			7
			8
			9
			10
			11
			12
			13
			14
			15
			16
			17
			18
			19
			20
			21
			22
			23
			24

System #	Person A	Person B
1	5	5
2	5	5
3	5	5
4	5	5
5	5	5

APPENDIX E

RELIABILITY FIGURES

System #	Person A	Person B
1	50	50
2	5	5
3	5	5
4	5	5
5	5	5

System #	Person A	Person B
1	5	5
2	5	5
3	5	5
4	5	5
5	5	5

System #	Person A	Person B
1	5	5
2	5	5
3	5	5
4	5	5
5	5	5

System #	Person A	Person B
1	5	5
2	5	5
3	5	5
4	5	5
5	5	5

Reliability—Rita

Episode	Person	A	B	C	D
	Seconds				
1	1	1	1	1	1
2	1	1	1	1	1
3	1	1	1	1	1
4	1	2	1	2	
5	1	1	1	1	1

B
a
s
e
l
i
n
e

	Episode #	Person A	Person B
	Seconds		
1	(19)	69	69
2	(20)	5	5
3	(21)	35	15
4	(22)	60	60
5	(23)	5	5

I
m
p
l
e
m
e
n
t
a
t
i
o
n

	Episode #	Person A	Person B
	Seconds		
1	(11)	3	3
2	(12)	1	1
3	(13)	1	1
4	(14)	1	2
5	(15)	1	1

A
s
s
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	Episode #	Person A	Person B
	Seconds		
1	(6)	1	1
2	(7)	20	20
3	(8)	100	96
4	(9)	1	1
5	(10)	5	3

R
e
t
u
r
n
T
o
B
a
s
e

	Episode #	Person A	Person B
	Seconds		
1	(13)	5	5
2	(14)	24	24
3	(15)	2	2
4	(16)	65	65
5	(17)	10	10

Reliability - Wendy

Episode	Person	A	B	C	D	E
	Seconds					
1		3	3	3	3	3
2		3	3	3	3	3
3		5	7	8	8	8
4		15	15	15	15	15
5		1	1	1	1	1

B
a
s
e
l
i
n
e

Episode #	Person A	Person B
1	(7)	5 5
2	(8)	3 5
3	(9)	6 6
4	(10)	8 8
5	(11)	10 10

I
m
p
l
e
m
e
n
t
a
t
i
o
n

Episode #	Person A	Person B
1	(1)	1 1
2	(2)	1 1
3	(3)	1 1
4	(4)	0 0
5	(5)	3 3

A
s
s
e
s
s
m
e
n
t

Episode #	Person A	Person B
1	(3)	12 12
2	(4)	1 1
3	(5)	17 17
4	(6)	10 10
5	(7)	1 1

R
e
t
u
r
n
t
o
B
a
s
e

Episode #	Person A	Person B
1	(20)	12 12
2	(21)	9 10
3	(22)	12 12
4	(23)	11 11
5	(24)	9 9