A STUDY OF THE TREATMENT OF BLINDISMS USING PUNISHMENT AND POSITIVE REINFORCEMENT IN LABORATORY AND NATURAL SETTINGS

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This is to certify that the

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ABSTRACT

A STUDY OF THE TREATMENT OF BLINDISMS USING PUNISHMENT AND POSITIVE REINFORCEMENT IN LABORATORY AND NATURAL SETTINGS

By

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The purpose of this thesis was to determine if a combination of punishment and positive reinforcement is effective in the reduction of blindisms, to determine the effects of such treatment on concomitant blindisms, and to observe the generalization of these effects to various stimulus situations. In addition, the literature reviewed indicated a need to test effective procedures for controlling blindisms and to introduce variations in the application of the treatment procedures to generate suggestions for procedures in classroom settings.

Six subjects (cases) were used each representing an independent experimental study. The subjects ranged in age from 16 to 20, with I.Q. scores from 85 to 134. Of the two males and four females, five of the subjects were blind due to retrolental fibroplasia and one student was blind due to optic atrophy. The visual acuity of the subjects varied from no light perception in either eye to light perception in both eyes.

A multiple baseline technique was used with each of the six cases. In three of the cases, an A-B-A-B reversal technique was also

applied. The study of six individual cases facilitated the use of a combination of replication designs (i.e., intrasubject direct replication and systematic replication). The hypotheses were tested by evaluating changes in the frequency and duration of the blindism.

The blindisms (sterotypic behaviors) observed in this study were head-rolling, rocking and eye-poking. These behaviors were recorded in terms of frequency and time (duration) of the blindism. The punishment or aversive stimulus used was a screeching sound of chalk on a blackboard. The positive reinforcer was money. The experiment took place at the Western Pennsylvania School for the Blind in a combination of three stimulus situations for each subject, a laboratory setting and two regular classrooms. For every subject there was first a period of observation to establish a baseline, followed by periods of treatment or of observation without treatment.

In every instance for all six cases, when punishment and positive reinforcement were introduced, there was a marked decrease in the frequency and duration of the blindisms.

The trend of the data offered moderate support for the generalization of a reduction of a blindism in a laboratory setting to a reduction of the blindism in a classroom setting, however there was a variability of results. This variability of results was also found in the data testing the hypothesis dealing with the generalization of a reduction of a blindism in one classroom setting to another classroom setting. While some of the cases offered moderate support for these hypotheses, there were instances also of contradictory findings, so that these results must be regarded as inconclusive.

The treatment and reduction of one blindism contributed to a simultaneous reduction in a second untreated blindism in four of the six cases. No data were available in one case and there was an increase in the second untreated blindism in the sixth case.

The results of a neutral stimulus (CS) paired with an aversive stimulus (US) during initial treatment sessions demonstrated that the CS served as an effective aversive stimulus in repeated treatment sessions.

Finally, the results demonstrated that the reduction of blindism in a laboratory setting contributed to a markedly reduced frequency and duration of this blindism over a period of time without further treatment.

A STUDY OF THE TREATMENT OF BLINDISMS USING PUNISHMENT AND POSITIVE REINFORCEMENT IN LABORATORY AND NATURAL SETTINGS

By

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CHAPTER I

INTRODUCTION

The most common treatment variables for behavior modification studies have been social reinforcement,--praise and other forms of attention from the teacher,--(e.g., Clark and Walberg, 1968; Schutte and Hopkins, 1970; Sibley, Abbot and Cooper, 1969; Thomas, Becker and Armstrong, 1969; and Ward and Baker, 1968); token economies,--points or counters which can later be exchanged for reinforcers,--(e.g. Glynn, 1970; O'Leary and Drabman, 1971; Packard, 1970; and Tyler and Brown, 1968) and contracts with the student that desirable reinforcers will be available at the completion of a specified task (e.g. MacDonald, Gallimore and MacDonald, 1970; and Smith, Brethower and Cabot, 1969). Punishment or the combination of punishment and positive reinforcement have been studied relatively little in educational settings, partly as a consequence of the stress on positive reinforcement and partly because educators and those working with them are apprehensive lest punishment be badly misused by untrained or insensitive teachers. However, the use of punishment often occurs, although its use has often been maligned and little understood as a method of behavior modification. Because the issue was unsettled with regard to the efficacy of the combined use of punishment and positive reinforcement, and because the use of punishment has not been widely investigated, there was a need to explore the effectiveness of punishment and positive reinforcement.

The use of behavior modification in remedying behavioral deficits of children has been demonstrated in numerous instances (Harris, Wolf, and Baer, 1964; Allen, Henke, Harris, Baer and Reynolds, 1967; Baer and Wolf, 1968; Hart, Reynolds, Baer, Brawley and Harris, 1968; Buell, Stoddard, Harris and Baer, 1968). These studies have singled out specific behavior problems for the child under study and have demonstrated that remediation can be achieved systematically.

The resulting changes in behavior were rarely questioned and were clearly desirable. However, the quantitative evaluation of concomitant behavior has been of little concern. The literature reviewed revealed one such study in which Buell, Stoddard, Harris and Baer (1968) made an attempt to deal with the problem of allied social behavior changes while studying a specific motor deficit. Therefore, there was a need to determine whether a reduction in one behavior would be accompanied by a reduction in a second allied behavior.

Finally, blindisms (sterotypic movements in blind children: e.g., rocking, unusual movements with the hands, rotating movements of the head, forward tilt of the head and eye poking) are apparent in most, if not all, congenitally blind children. These blindisms are undesirable in that they draw attention to the individual's exceptionability, but they also have other adverse consequences. They contribute to poor and inefficient work and/or study habits. They cause fatigue, pain, general discomfort and they disrupt communication (Scott, 1969). These behaviors may hinder the social acceptance of blind individuals by drawing attention to their differences. Sighted people may intrepret these behaviors as indications of emotional maladjustment or other types of mental disorders. Many authors have offered interpretations of these blindisms (Cutsforth, 1951; Holand, 1971; Lowenfeld, 1964; Smith, Chetnik and Adelson, 1969; Spencer, 1960; and Thurrell and Rice, 1970). However, the literature reviewed for this study failed to reveal any systematic and effective procedures for controlling blindisms in the school setting. Therefore, a need existed to explore several variations of treatment procedures which could be used by teachers in classroom situations to effectively reduce blindisms.

Purpose

Since the combined use of punishment and positive reinforcement has been studied relatively little, one purpose of this study was to explore the use of punishment and positive reinforcement in the reduction of blindisms among blind adolescents.

As few studies have made an attempt to deal with the effects of the treatment of one symptom on a presumably related symptom, a second purpose of this study was to determine if a reduction in one blindism is accompanied by a reduction in a second blindism.

However, the above purposes deal only with principles of behavior modification and it has been pointed out that there is a need to test effective procedures for controlling blindisms. Therefore, a third purpose was to determine if the proposed treatment procedures are effective in controlling blindisms.

Finally, a fourth purpose of this study was to introduce variations in the application of the treatment procedures (i.e., punishment and positive reinforcement) to generate suggestions for the application of these behavior modification procedures in a school setting.

Research Questions

1. Can blindisms be effectively reduced by a combination of punishment and positive reinforcement with short-term treatment procedures applied in a school setting?
2. Will the reduction of blindisms in a laboratory setting lead to a simultaneous reduction of blindisms in classroom settings?
3. Will reduction of blindisms in one classroom setting lead to a simultaneous reduction of the blindisms in other classroom settings?
4. Will a reduction in one blindism lead to a simultaneous reduction in second untreated blindism?
5. Will a neutral stimulus (CS) paired with an aversive stimulus (US) during initial treatment serve alone as an effective aversive stimulus in a repeated treatment session?
6. Will successful reduction of a blindism in a laboratory setting be reflected in a reduced manifestation of the blindism in classrooms over a period of time without further treatment?

Organization of the Remainder of the Thesis

Chapter II contains a summary of the literature, including literature related to: blindness and blindisms; similar mannerisms; behavior modification techniques; the use of punishment; and behavior modification in natural settings. A description of the methodology used in this study is presented in Chapter III. A summary of the results is presented in Chapter IV. A discussion and summary of the study is found in Chapter V.

CHAPTER II

REVIEW OF LITERATURE

Literature Related to Blindisms

Many professionals working with visually handicapped individuals have interpreted the presence of blindisms in many ways. One of the prominent interpretations is that of Cutsforth (1951). He believes that while the normal child's life develops to include an ever-widening range of stimulation, the blind child must find his only stimulation within bodily reach. From the onset of blindness, the blind child constitutes the greatest part of his own environment. Therefore, he finds in himself the stimulation and motivation to action that the seeing child finds in his visual environment.

Cutsforth also discussed the nature of the stimulation that the tactual environment provides. He indicates that the greater part of the blind child's environment consists of the self, as soon as it is differentiated from a meaningless mass of clothing and blankets. The body becomes at once the source and the object of stimulation. Thus, the patterns for bodily stimulation and manipulation are established in the cradle; and it may be counted on that they will persist until other, and equally adequate forms of stimulation are substituted. These acts of automatic self-stimulation to be found among the blind are commonly known under the generic term of blindisms. Children who have a very slight degree of vision usually adopt the blindism that consists of fluttering the hands and fingers before the eyes so that the movement of light and shadow may be observed. Tactual stimulation takes the form of thrusting the fingers into the eyes, nose, or mouth, or manipulating appendages such as ears, nose, lips, or locks of hair. Proprioceptive stimulation is produced through bodily swaying, rolling or tilting the head, arm motion and shoulder shrugs, and exaggerated genuflections. Some believe blindisms to be nervous habits of one sort or another. Supporting such a view, Spencer (1960) discussed the values in taking a blind child for a walk, stating that it helps to cut down on the amount of nervous tension marked by the eye rubbing and other mannerisms that may be seen in some blind children. In an anecdotal report describing two blind children, Spencer notes that "Johnny's tension mounts and he rubs his eye, a habit often exhibited in moments of frustration. However, it is normally outgrown, completely, by the time a blind child reaches school age."

Lowenfeld (1964) when discussing blindisms agrees with the lack of stimulation hypothesis and states that it can be easily understood that a child who does not get visual stimulation from the outside world will turn to his own body for stimulation. The blind child will continue to do this if he finds it satisfactory or pleasurable.

Can the blind child be kept sufficiently stimulated to avoid development of blindisms? Lowenfeld believes that it would not be wise to attempt such stimulation. The blind child cannot hope to match the many impressions which the seeing child receives from his environment, and the same holds true of his outlets for activity. Therefore, Lowenfeld maintains that it would appear almost normal for the blind child to resort to some self-stimulation. As the blind child grows older, he will be able to develop interest in a greater variety of activities, and in due time they will supplant his mannerisms because of their greater power to provide satisfaction. Because of this, although these mannerisms are quite commonly observed among young blind children, they may decrease in the lower grades and possibly disappear almost completely in the high school child and in blind adults. Lowenfeld points out that when a blind person develops some peculiar habits, as seeing people do, the public has been unduly ready to ascribe to his blindness these mannerisms, which otherwise would receive little or no attention or interpretation.

Lowenfeld does not believe that much can be done about the mannerisms while the child is quite young and that, in fact, the child who is forced to stop one mannerism may develop another one. But as the child grows older and becomes capable of being active in a variety of ways, more able to control himself by his own will power, and more open to reasoning, the time is ripe for a natural abandonment of these mannerisms. He goes on to say that if the child is provided with opportunities for experiences and is kept busy, if he is encouraged to experience his own will, and if he knows that these mannerisms are not acceptable to others, he will in all likelihood give them up as time goes on.

Many parents are concerned about these mannerisms because they fear the mannerisms are a sign of their child's lack of mental capacity. Lowenfeld feels that this is not at all true unless these habits persist, and there are other indications of mental retardation. He believes that the mannerisms as such must be considered as quite "normal."

While there have been many interpretations of blindisms, Lowenfeld's (1964) and Cutsforth's (1951) interpretation, indicating a lack of stimulation as the cause, is the most prominent. Even though there has been a great deal of speculation as to the origins of these blindisms, a review of the literature failed to reveal any studies that dealt with the systematic control of these stereotypic behaviors.

Literature Related to Similar Mannerisms

Many interesting and bold interpretations of habits, not "blindisms" specifically, were reported in a study by Dunlap (1945). He defines tics as "obsessive motor performances such as thumbsucking and fingernail biting, and recurrent movements of an annoying sort, such as jerking the head, twisting the shoulders, making facial grimaces, etc."

Dunlap states that tics are generally symptoms of basic maladjustments, the sources of which are various. He states that in eliminating the tic, there must be, on the part of the patient: an understanding of the habit and its detrimental effects; the ideal of abolishing it and the desire to be free from it; and faithful carrying out of the practice prescribed. He believes that tics are sometimes due to inadequate outlets for certain normal desires such as sex. Spasmodic twisting of the head is an example. Elimination of a tic of this type involves producing the tic voluntarily. Sometimes after a few such sessions, the tic is permanently abolished, but a tic of a different sort takes its place. If other tics develop as substitutes for the original one, these should be treated concurrently. Dunlap states, "It may be that the basal maladjustment of the patient is little modified by the abolition of the tic."

It has been hypothesized that some ticks may be drive-reducing conditioned avoidance responses, originally evoked in a highly traumatic situation (Yates, 1958). In such a traumatic situation, intense fear has been aroused and a movement of withdrawal or aggression was made. If the movement produced or coincided with the cessation of the fear inducing stimulus, it acquired strength through reinforcement. On subsequent occasions, through stimulus generalization (including internal symbolization), conditioned fear (anxiety) may be aroused, which has then been reduced by the performance of the movement. In this way the tic, eventually elicited by a large variety of stimuli, achieves the status of a powerful habit.

It has been demonstrated (Yates, 1958) that animals placed in a highly traumatic situation develop conditioned avoidance responses which apparently reduce the anxiety associated with the original situation and which are highly resistant to extinction. It has been suggested that the tic is an avoidance response arising originally in a highly traumatic situation, especially in childhood. Next, the kind of response evoked may be determined partly at least by the mode of response characteristic of the subject in any stressful situation. In terms of Hullian learning theory (Yates 1958), the reaction potential of the tic at a given moment may be conceived as a multiplicative function of the habit strength ($_{s}H_{r}$) of the tic (determined mainly by the number of times it has previously been evoked) and the momentary drive strength of anxiety (D), which fluctuates from time to time.

Yates reported a successful experiment on the extinction of four tics in a female psychiatric patient of high average intelligence. He based his method of treatment on a theoretical model treating the tic as a simple learned response which has attained its maximum habit strength. His general hypothesis was that massed practice of the tic leads to a significant decrement in the ability of the subject to respond voluntarily, and eventually leads to extinction of the tic by the process of building up a negative behavior pattern of "not performing it." His results confirmed this hypothesis. He described several experiments in detail but the main outcome was that very prolonged periods of massed practice, followed by prolonged rest periods, produced the largest declines.

Lovaas, et al. (1967) worked with children whose behavioral repertories were restricted to three simple categories: (a) self stimulation (stereotyped, repetitive behavior such as rocking, twirling, spinning, etc.); (b) tantrums, including self-destructive behavior (e.g., head-banging); and (c) vocal output involving mostly vowels, tongue clicking, etc. The method used to establish nonverbal imitation involved a set of successive discriminations. Therefore, the children were positively reinforced (food) for closer and closer approximation to the attending adult's behavior. The procedure was on a one hour a day, five days a week basis, involving sixty behavior items or tasks.

One autistic girl, for example, was engrossed in self-stimulatory behaviors for as much as 99% of her day. After one year of training in nonverbal imitation, she demonstrated a preference for engaging in appropriate play (drawing and painting) and the pathological behaviors were reduced greatly.

Macpherson (1967) attempted to apply some of the procedures used in behavior therapy in symptomatic relief of a patient suffering from Huntington's chorea. Prior to training, the patient attempted to reduce involuntary movement in her legs by pressing her hand down on her knee. Generally, the result of this was that involuntary movement was temporarily avoided and the patient's attempt at control was immediately reinforced. However, when the involuntary movement did take place, the marked increase in muscle tone which accompanied it added to the explosive and gross character of the movement. Since the response of increased muscle tone was immediately reinforced it had become established as a habit. The training involved three stages: (1) training in relaxation; (2) training in attending to interoceptive afferent input associated with the onset of involuntary movement; and (3) training in reciprocal inhibition of involuntary movements by deep muscle relazation. The patient showed marked improvement and treatment was no longer needed after six weeks.

As pointed out, attention toward a particular motor behavior to be extinguished may, in fact, increase the frequency of the undesired behavior. Madsen, et al. (1968) observed the reinforcing function of "sit-down" commands. After a baseline of standing-up behavior was established, the teachers were instructed to attend more to standing up behavior and this behavior, in fact, tripled. Finally, teachers praised incompatible behavior (sitting in seat) and standing up behavior fell far below the baseline. Therefore, attention to the inappropriate behavior of standing served to increase the frequency of this behavior.

Barrett (1962) describes an application of free operant methods to the control of multiple neuromuscular tics in a 38 year old subject. By use of a tape recorder, a positive stimulus (music) could be removed or an aversive stimulus (noise) presented when a tic occurred. The contingency arrangement was programmed so that each tic produced a 1.5 second interruption of music. If the patient did not tic for at least 1.5 seconds, he could hear the music until it was automatically interrupted by the next tic. This tic-contingent interruption of music by white noise proved to be very effective.

The above studies indicate that there are a variety of interpretations as to the causes of various stereotypic behaviors (Dunlap, 1945; Yates, 1958). Some of these same behaviors are labeled blindisms when emitted by blind individuals. Yates viewed these behaviors as learned, and successfully controlled them by utilizing massed practice. Lovaas, et al. (1967) positively reinforced appropriate modeling. Barrett (1962) effectively used positive reinforcement and punishment to control multiple neuromuscular tics. Based on the success of the studies cited, it would appear that control of blindisms could also be achieved.

The Use of Behavior Modification Techniques

During the past few decades an experimental analysis of behavior has produced several powerful and reliable techniques for controlling behavior (Holland and Skinner, 1961). Although these procedures were originally established with lower organisms, research has shown that, if principles of behavior are determined clearly and then applied in a systematic manner to human beings, the final result is a much more effective training program (Watson, 1967). The extension of these procedures to human behavior was made when Lindsley (1956) successfully applied the methodology of operant conditioning to the study of psychotic behavior. Following Lindsley's example, numerous investigators have demonstrated that, in its essentials, the behavior of mentally defective individuals (Orlando and Bijou, 1960), stutterers (Flanagan, Goldiamond and Agrin, 1958) and economically deprived children (Hall, Lund and Jackson, 1968) is subject to the same controls.

Data have provided evidence that maladaptive behavior can be modified by the teacher in a variety of situations and contingencies. Hart, Reynolds, Baer, Browley, and Harris (1968) demonstrated the positive effect of adult social reinforcement contingent on the cooperative play of a nonsocial disruptive five year old. Hewett (1967) developed an engineered classroom design in four public school systems and a hospital setting. He stated that "one of the aspects that most impressed observers is the purposeful, controlled and productive atmosphere in the classroom." Allen, Turner and Everett (1970) found that the deciding factor in improving the behavior of children in a Head Start class was the teacher's behavior and the use of appropriate reinforcement techniques. They stated that "successful behavior modification depends on correct teacher-child interaction." A study dealing with the handling of tantrums, irrelevant verbal behavior and baby talk (Zimmerman and Zimmerman, 1962) used attention as the reinforcer. At the conclusion of this study the subject was working more efficiently in class and was reported to be making good progress. His speech was generally characterized by relevancy and maturity.

In working with undesirable behavior, Girardeau and Spradlin (1964), Gordon and Hollis (1965) and Colwell (1966) recommended extinction to eliminate undesirable behavior patterns while simultaneously using positive reinforcement to develop desirable behavior that would be incompatible with the unwanted behavior. Girardeau and Spradlin (1964) used token reinforcement to eliminate temper tantrums in a retarded girl. They also differentially reinforced verbal behavior in a girl who had a reputation for continually complaining and had repeatedly alienated herself from institutional members because of this behavior. She was reinforced for making positive statements while extinction was used to eliminate her noxious verbal behavior.

Gordon and Hollis (1965) noted there was minimal interaction between attendants and retardates, except when retardates were engaged in undesirable acts, e.g., those who were in imminent danger from self-destructive acts, those who became overtly aggressive, those who soiled themselves, or those who tore or otherwise were destroying their clothing." Such findings have been noted in other studies dealing with both children and adults and the thinking has been that much of the maladaptive behavior was due to reinforcement of this behavior and ignoring of the appropriate behavior.

Flanagan, Goldiamond and Azrin (1958) worked with three male stutterers. The S's read from printed pages and every time they stuttered, the experimenter pressed a microswitch and initiated a 30-minute period of response-contingent stimuli. Use of noise as an aversive stimulus was contingent upon stuttering or could be escaped by not stuttering. When termination of a noxious stimulus was made contingent upon stuttering, stuttering increased. When onset of a noxious stimulus was made contingent upon stuttering, stuttering decreased. For one S, stuttering was completely suppressed, and this suppression continued beyond the termination of the aversive contingency.

Wolfe, Risley, and Mees (1964) used operant conditioning procedures on the behavior problems of an autistic child. The behavior problems included temper tantrums, not wearing glasses, bedtime problems, verbal problems and eating problems. A combination of mild punishment and extinction, and also successive approximation, were procedures employed on these problems. A follow-up report six months after the child's return home indicated he wore his glasses, had no tantrums, no sleeping problems, and was more verbal.

Bandura (1961) who has reviewed much of the literature concerned with the direct manipulation of "symptomatic" behavior, concludes:

> On the whole the evidence, while open to error, suggests that no matter what the origin of the maladaptive behavior might be,

> a change in behavior brought about through learning procedures may be all that is necessary for the alleviation of most forms of emotional disorder. If the teachers' behaviors are 'correct,' then the behaviors of the student will become progressively better; that is, the student will be learning. At the same time, the 'correct' behaviors of the teachers will be reinforced by the progress of the student and, thereby, be maintained.

Bandura further stated that "more and more cases of non-learning are, simply enough, reinforcement problems." In summarizing "correct" teaching behavior for behavior modification, Larsen (1970) provided further rationale for the use of the techniques. He stated:

> In any instructional setting, the presence of a reinforcer and its administration contingent upon appropriate responding must be assured . . . very little appropriate student behavior is generated in the absence of reinforcement. Reinforcement is a highly individual thing, and especially in dealing with the multiply handicapped, wide individual differences with respect to what is, and what is not, reinforcing can be expected.

For efficiency in teaching, Larsen stressed the need for precise assessment of the behavior of the student prior to his beginning the instructional program and equally precisely, his behavior when he completes the program.

The studies reviewed in this section indicate that behavior modification techniques have been successfully used to control a variety of undesirable behaviors. While none of the studies dealt specifically with stereotypic behaviors in blind children some of the blindism-like behaviors were controlled in other exceptional children.

The Use of Punishment

Several behavioral techniques can be used to reduce the rate of an undesirable behavior pattern. Generally, the best known of these techniques are extinction, reinforcement of an incompatible response, and punishment. Extinction technique involves the discontinuation of reinforcement for a response. Conditioning one or more responses that are incompatible with the undesirable response represents the incompatible response procedure. Punishment may involve either of two procedures: "the presentation of an aversive stimulus, such as electric shock, following the response. The second involves the removal of a positive reinforcer, such as food, following the response" (Vakelich and Hake, 1971).

These three behavioral techniques can be used in combination to increase the likelihood of eliminating the undesirable response, i.e., undesirable behavior patterns are extinguished and punished while incompatible responses are reinforced.

For many years theorists avoided the use of punishment regarding it as unpredictable and likely to produce undesirable side effects (Kanfer and Phillips, 1970). The use of punishment has also been studied relatively little in educational settings, partly as a consequence of the stress on positive reinforcement, ethical considerations, and the realization that punishment could be badly misused by untrained or insensitive teachers.

Recent research has clarified parameters governing the diverse effect of punishment, and resulted in a re-examination of its supposed harmful side effects (Kanfer and Phillips, 1970). Reviews of the punishment research such as those by Church (1963), Solomon (1964), Azrin and Holz (1966), Boe and Church (1968), Campbell and Church

(1969) and Brush (1971), have fostered renewed investigation and research with punishment.

Punishment has often been the procedure of choice because the reinforcement history and current maintenance of the undesired behavior was unknown. Without such knowledge the use of extinction or the use of the same reinforcer with an incompatible alternative behavior is not possible.

The punishment procedure using an aversive stimulus has been shown to be effective with responses that need to be reduced immediately (Bucher and Lovaas, 1967; Tate and Baroff, 1966; Lovaas and Simmons, 1969), and responses that cannot be eliminated with any other procedure (Risley, 1968).

Punishment studies utilizing the procedure of removing positive reinforcers have also eliminated undesirable behavior patterns (e.g., Wolf, et al., 1964; Zeilberger, Sampan and Sloane, 1968; Bostow and Bailey, 1969; Sloane, et al., 1967). However, punishment by means of a reduction in positive reinforcement was not as effective as the punishment procedure using an aversive stimulus in eliminating undesirable climbing behavior (Risley, 1968). Lovaas and Simmons (1969) found punishment by a reduction in positive reinforcement to be effective in eliminating self-destructive responses, but it took so long that its practical value in preventing physical injury was questionable. The incompatible response procedure has a similar drawback. Lovaas, Freitag, Gold and Kassorla (1965) and Peterson and Peterson (1968) have shown that this procedure can reduce self-destructive behavior, but the time required to condition incompatible responses makes the procedure less practical than punishment by using an aversive stimulus.

Holz and Azrin (1963) have listed four criteria on which to measure the effectiveness of procedures designed to eliminate behavior: the immediate effect, the enduring effect; whether or not the effect is reversible; and whether or not suppression is complete. They compared the following procedures which reduce response ratio: stimulus change; extinction; satiation; physical restraint; and punishment. Overall, punishment was the most effective. Therefore, neither the incompatible response procedure nor punishment by the removal of a positive reinforcer are as fast or as effective as punishment by an aversive stimulus.

Among the parameters that influence the effectiveness and durability of punishment discussed by Kanfer and Phillips (1970) are the stimulus intensity and contingency schedule, the immediacy and frequency of punishment, the possibility of undesired escape responses, the absence of positive reinforcement as a predictable sequel to punishment, and simultaneous development of alternative desirable behaviors which produce positive reinforcement. "Available evidence does not support earlier suspicions that punishment and other operations with aversive stimuli need have harmful side effects, when the procedures are properly constructed and applied to suit the individual circumstances" (Kanfer and Phillips, 1970).

Investigators who have used aversive control have reported the effects on other areas of behavior as well as on the target behavior. Risley (1968) monitored a number of other behaviors while punishing climbing by a shock, and autistic rocking by shouting and shaking, in a six-year-old girl. Punishment was applied in the laboratory and at home, both by the investigator and by the mother. In both cases, the target behaviors were rapidly eliminated.

Among the side effects noted were increases in similar behavior (e.g., climbing on a chair) when the target behavior patterns were suppressed (i.e. climbing a book case). However, when this response was also punished, no other substitute appeared. No general avoidance of the situations or of punishing agents was reported. Instead, avoidance responses were highly specific. No other behavior patterns were suppressed, nor did any aggressive behavior occur. Despite the stimulus control exerted by the investigator over response rate, the girl increased her eye contact with him after punishment began, thereby enhancing other training activities, and she otherwise behaved no differently with the experimenter. Risley concludes:

> The most significant side effect was the fact that eliminating climbing and autistic rocking with punishment facilitated the acquisition of new desirable behaviors. . . . Some deviant behaviors, maintained by unknown variables, interferred with the establishment of new behaviors. This interference was not primarily due to a physical incompatibility between the behaviors. This interference, which might be termed 'functional incompatibility,' suggests that the elimination of such deviant behaviors may be a necessary prerequisite to the establishment of new behaviors (pp. 25-26).

Bucher and Lovaas (1968) report similar results for their clinical use of punishment. After self-destructive behaviors were suppressed by shock and generalization was promoted by use of several punishing agents in several environments, their autistic boy exhibited less avoiding of adults and less crying. Eliminating previously necessary physical restraints, he also rapidly developed many desirable behaviors. Comparable positive side effects were noted in other children.

The generalization of a response suppression produced by punishment has been dealt with in several studies (Corte, Wolf, and Locke, 1971; Azrin, 1956, Brethower, and Reynolds, 1962). When punishment is associated with one set of "safe" stimuli (S^{Δ}) (Azrin, 1956), in some cases, a contrast effect may boost responding in the safe context (S^{Δ}) above what it had been before treatment (Brethower, and Reynolds, 1962). Birnbauer (1968) provides a clinical illustration of the effects of punishment so highly discriminated as to thwart therapeutic goals. The subject, an adolescent retardate, had to be kept in restraints constantly because of his biting and other destructive acts. In laboratory sessions intense shock was contingent on destructive acts, and the specific target behaviors were quickly eliminated. However, verbal warnings, paired with shock in an effort to make them conditioned aversive stimuli, were effective only when spoken by the person who had actually administered shock (S^{D}). Concurrent attempts to reduce another destructive act (i.e. napkin-tearing during meals) by reinforcing competing responses and time out contingent upon the target behavior were tried. These procedures had no effect. Only when shock was administered for this specific response was it suppressed. Birnbrauer concluded that application of punishment requires safeguards "against the formation of discriminations--between responses, between a response at one time from the same response at other times, between situations, and between people" (p. 209).

Punishment may use a variety of aversive stimuli. Punishment by electric shock has been used effectively with retarded and autistic children to increase social behavior (e.g., Lovaas, Schaeffer, and Simmons, 1965), to decrease self destructive and other deviant behavior (e.g., Lovaas and Simmons, 1969; Risley, 1968; Tate and Baroff, 1966) and as an aversive stimulus for inattentive behavior and incorrect responding in a picture naming task with retarded children (Kirsher, Pear and Martin, 1971).

Noise has also proven to be an effective, non-detrimental stimulus. Wickes (1958) treated a number of Ss for persistent enuresis with the use of a loud buzzer. Azrin (1958) demonstrated that intense noise (95 db of white noise) can serve as an aversive stimulus to modify behavior. These studies demonstrate that response-contingent noise produces large and stable modifications of performance.

In a study by Azrin, et al. (1968) a sound was used as an aversive stimulus to correct rounding of the back or slouching. An apparatus was developed that provided a warning stimulus followed by an aversive tone for the duration of slouching. Slouching was thereby punished by the onset of the tone, and non-slouching was reinforced by tone termination and postponement. The experiment involved twenty-five adults who wore the apparatus during their normal working day during alternate periods in which the aversive tone was connected and disconnected experimentally. Also, a miniature time meter was used to record the duration of slouching. The results showed that slouching decreased for each subject. Two subjects were used as an experimental control in which slouching terminated the tone. The result was an increase of slouching, demonstrating that the postural changes were controlled by the scheduled relation between the aversive tone and the slouching response.

The condition of spasmodic torticollis is one in which there is a disorder of the cervical muscles, resulting in abnormal movements or positioning of the head. This condition may be a symptom of a neurological disorder, or it may be hysterical in origin. Brierley (1967) devised a technique in which the occurrence of the undesirable habit of inclining the head was associated with an aversive stimulus. The apparatus consisted of a headgear which could be positioned firmly over the top of the head. A clip slid along the head band and carried a small mercury switch. As the head tipped a circuit was completed causing a shock to the head. Two patients were treated on a weekly basis in three, three-minute reading sessions divided by five-minute rest periods. Symptoms disappeared after about the tenth session. The patients were treated for four and nine months respectively and in a one year follow-up study, symptoms had not recurred.

Punishment suppresses old behaviors whereas positive reinforcement strengthens new. By breaking up an old behavior pattern, punishment can provide the occasion for the positive reinforcement of new or more advantageous behavior that was of greater value to the subject (Kanfer and Phillips, 1970). Kircher, Pear and Martin (1971) demonstrated that mild shock that was used in conjunction with positive reinforcement was more effective and faster in teaching retarded children to name pictures than other procedures. In addition, the combined procedure produced a greater decrease in the ratio of incorrect responses to correct responses. Because of these effects, the absolute number of correct responses tended to be increased and the learning rate was much higher than that produced by the other procedures.

MacMillan, Forness, and Trumbull (1973) emphasize the fact that punishment is particularly effective if at the same time the socializing agents (e.g., teachers) provide information concerning alternative desired behaviors. The teacher must therefore provide and reinforce alternatives to the punished behavior. It is often important that these be competing behaviors or responses that are incompatible with the undesirable behavior. In essence, the teacher clearly communicates that behavior A is not appropriate but behavior B is appropriate.

Frequently, as is the case with blindisms, children are exposed to constant criticism or punishment by teachers and/or parents. Azrin (1959) reported that extended periods of punishment diminished its effectiveness. A child becomes adept at "tuning out" the berating mother or teacher; repeated spankings become old hat, criticisms tend to be accepted as a part of life and cease to arouse much anxiety.

The studies reviewed above suggest that the judicious use of punishment and positive reinforcement can be a very fast, effective and enduring technique for controlling behavior. Such techniques have been effectively used on behaviors similar to blindisms. While blind children may have long histories of receiving criticism about their undesirable behavior, they may have tuned out this consequence of their behavior. Finally, electric shock and noise have proven to be effective aversive stimuli; however, the use of shock is frequently not permitted.

Behavior Modification in Natural Settings

The previous studies have demonstrated the success of behavior modification as a technique of changing behavior. However, this evidence is limited to laboratory or highly controlled classroom settings. Thus the usefulness of current behavior modification techniques in non-research oriented human service settings such as public schools, prisons, mental hospitals and institutions for handicapped individuals is unclear. Reppucci and Saunders (1974) point out that

> The point to be made is not simply that there is a large gap between what is real and what is imagined about the social application of behavior modification; rather, it is that there are reasons for this gap, and that some of these reasons fall outside the domain of behavioral technology as it is presently elaborated. Although there is little question that behavior modification techniques have potent, predictable effects under carefully controlled conditions, psychologists have only a slight comprehension of their effects under less-than-optimal conditions usually encountered in natural settings. Most of the academic literature in the field leaves one with the impression that implementation of an effective modification program is a straightforward, trouble-free affair, and that all one really requires for success is an understanding of learning theory and the techniques of behavior analysis (e.g., Bijou, 1970; Ullmann, and Boren, 1968; Tharp, and Wetzel, 1969). In natural settings, the behavior modifier faces a variety of problems that do not relate directly to theoretical issues in behavior modification and that are either nonexistent or relatively inconspicuous in the laboratory or special research situations, where the investigator has almost complete control over the contingencies of reinforcement. Failure to appreciate the importance of these problems may be the primary reason why demonstration projects so often fail when efforts are made to transfer them out of the isolated classroom, ward, or building and into the natural setting (pp. 649-650).

Reppucci and Saunders (1974) further discuss eight problems that confront the change agent in natural settings and tend to mitigate the attainment of optimal results. The first problem, the institutional constraint is often labeled as "red tape" or "administrative matters." These are constraints that occur by virtue of common institutional procedures and arise with great frequency, regardless of the particular individuals who occupy specific positions. The second problem, external pressure, often dictated by political, economic, or administrative considerations is always a potential force for change. However, the direction of change valued by the external pressure does not necessarily coincide with what is seen as desirable by the behavior modifier. Therefore the process of change can seesaw under the alternating influence of the behavior modifier and external pressure.

It is important to develop a common vocabulary among staff in the natural setting. The third problem is therefore the problem of language (i.e., communication). The fourth problem of two populations concerns the situation where the behavior modifier is not able to work directly with his subject. In natural settings the indigenous personnel must be utilized to perform the actual behavior modification operations. Therefore the behavior modifier can influence the behavior of subjects only by modifying the behavior of the staff.

The problem of limited resources can be quite severe in natural settings. Many very desirable behavior changes are possible "in principle" or in the research laboratory, but not in the "real world." In short, since all of the operations normally performed by elaborate equipment or skilled research assistants in the controlled laboratory must be left to indigenous staff and the creativity of the behavior modifier in most uncontrolled natural settings, the precise measurement of behavior necessary for optimal behavior modification cannot be obtained.

In the natural setting the problem of labeling occurs since behavior modification programs encompass a wide range of activities that often bear value-laden labels such as education, recreation, therapy and rehabilitation. In such cases the indigenous staff may respond to the label of the activity rather than the function.

The seventh problem is one of perceived inflexibility. A variety of circumstances, some of which have been mentioned already, make it difficult to establish and maintain a behavior modification program in the natural environment. Because of this, behavior modifiers working in the natural environment must struggle constantly to ensure the basic integrity of the programs they develop while at the same time not becoming unduly and unrealistically rigid; that is, they must strive for flexibility but within a theoretical context.

The eighth problem discussed by Reppucci and Saunders (1974) concerns the problem of compromise. Objectivity may be readily lost in natural settings, which are characterized by the values or preferences that govern their operations. Therapeutic contingencies of reinforcement are by definition statements of values in the sense that certain of the subject's behaviors are rewarded over others, and a project is not likely to be supported by the setting unless the values of the behavior modification programs are at least somewhat concordant with the values of powerful individuals in that setting. Therefore, the behavior modifier is permitted entry to the setting only as long as he embraces certain of the values of the institution and its staff. This situation can lead to compromises (trade offs) that may jeopardize the objectivity and integrity of the research.

The fact that some applied research efforts have successfully and closely adhered to principles of good design and research methodology suggests that compromise on the fundamentals of scientific analysis is not always necessary, although circumstances and problems peculiar to each research setting will effect the degree of sophistication in design and execution that each study attains.

MacMillan, Forness, and Trumball (1973) state that classroom teachers are often faced with the problem of eliminating or weakening certain behaviors that are either interfering with a child's learning or hindering his social adjustment. This appears to be particularly true of teachers of exceptional children. MacMillan, Forness, and Trumball further state that based on the literature the only viable alternatives available to the classroom teacher are extinction and counter-conditioning (reinforcing a behavior that is incompatible with the undesirable behavior). Punishment has all but been rejected theoretically, yet remains one of the most commonly used behavioral devices by parents and teachers. Johnston (1972) discusses several issues concerning the use of punishment in natural settings. He maintains that the behavior modifier must attempt to define and control, as carefully as feasible, factors in the natural setting such as the reinforcers for the response to be punished. If punishment procedures are less successful than expected, the behavior modifier must be ready to admit that the uncontrolled factor in the natural setting may have hindered the effects of the punishing stimuli.

Johnston states that a great deal of concern is frequently expressed in applied settings over whether or not the punishing effects will generalize to other settings in which the response has not been punished and if undesirable responses that have not been punished will similarly decrease in frequency. The punishment of a response in one situation and not in others is likely to increase the sharpness of the control, but it may well decrease the probability that the response will be reduced in nonpunishment situations.

In many cases the teacher serves as a S^D discriminative stimulus: that is, a stimulus during which if the child responds in a certain way he will receive punishment (or reinforcement). This is in contrast to the S^Δ situation in which a different teacher may represent the absence of any contingency (i.e., punishment or reinforcer).

This was the case in a study reported by Ramey (1974):

> (1) the elimination of the self-abusive behavior remained person and place specific. That is, the behavior was eliminated only when the child was both (a) in the classroom and (b) in the physical presence of the teacher. The child was quickly able to discriminate that the device would not be employed by others. It was amazing to see how quickly a severely retarded child could learn that discrimination. Face slapping behavior that would go on in the hallway would stop immediately upon entering the classroom where the teacher was present. This effect of aversive conditioning has been noted in a number of studies (Risley, 1968; Birnbauer, 1968; Lovaas, and Simmons, 1969; Corte, Wolf, and Lock, 1971; Azrin, and Holtz, 1966). Lovaas (1969) has noted if punishment to suppress self-destruction is to be maximally therapeutic (i.e., durable and general), it has to be administered by more than one person, in more than one setting. Practical problems prevented that being done in this case, with the results being the lack of generalization effect. (2) While

the face slapping was eliminated, the crying that frequently accompanied the behavior was not eliminated, although it was significantly reduced.

The studies cited above point out a variety of problems when applying principles of behavior modification in a natural setting as outlined in this study. The problems of institutional constraints, external pressures, language, two-populations, limited resources, labeling, perceived inflexibility, and compromise affect the degree of sophistication in design and execution that a study attains when being conducted in a natural setting.

The use of punishment and the generalization of the effects derived from the aversive stimulus can be greatly influenced by the natural setting. The use of a small residential institution such as the one used in the present study, may in effect magnify the problems described above or introduce unique problems not mentioned.

CHAPTER III

METHODOLOGY

This study consists of six individual case studies utilizing experimental designs employing research strategies that have become traditional in the study of operant conditioning. This chapter is in two parts: the first describes general aspects of the research methodology that apply to all of the individual case studies; the last part of the chapter describes the individual studies.

In stressing a functional analysis of behavior within a behavior modification framework, Sidman (1960) emphasizes that "a group function may have no counterpart in the behavior of the individual. . . " (p. 53). He maintains, for example, that replications across successive individual subjects (each dealt with singly) are more powerful in testing the reliability of a central tendency than are group data which cannot indicate the nature of exceptional cases. Therefore, Sidman maintains that replication of observed functional relationships within the same individual is the most powerful investigative tool.

The study of six individual subjects facilitated the use of a combination of replication designs. Sidman states, "The soundest empirical test of the reliability of data is provided by replication."

Direct replication was achieved by making repeated observations on the same subject under each of several conditions (intrasubject). Systematic replication was achieved by varying the method of presentation of the independent variable as well as the situation in which it was presented. According to Sidman (1960) ". . . every successful systematic replication demonstrates that the finding in question can be observed under conditions different from those prevailing in the original experiment. Where direct replication helps to establish generality of a species, systematic replication can accomplish this and, at the same time, extend its generality over a wide range of different situations."

The A-B-A-B reversal technique and the multiple-baseline technique were used. In the A-B-A-B reversal technique, a behavior is measured and examined over time to establish a baseline. Then, the treatment or independent variable is applied and the behavior continues to be measured to determine if in fact behavior has been affected. If a change has occurred, the independent variable is discontinued to see if the behavioral change just brought about depends on this variable. If so, the behavioral change should be lost or diminished. The independent variable is then applied again to see if the behavioral change can be recovered. The behavioral change may be reversed briefly again, and so forth.

Hypotheses

Following are the hypotheses of the study.

Hypothesis 1: The application of punishment and positive reinforcement reduces a blindism. Hereafter, this hypothesis has been referred to as the "Treatment" hypothesis.

Hypothesis 2: The reduction of a blindism in the laboratory sessions contributes to a simultaneous reduction of the blindism in classroom situations. Hereafter, this hypothesis has been referred to as the "Laboratory Generalization" hypothesis.

Hypothesis 3: The reduction of a blindism in one classroom setting contributes to a simultaneous reduction of the blindism in other classroom settings. Hereafter, this hypothesis has been referred to as the "Classroom Generalization" hypothesis.

Hypothesis 4: The treatment and reduction of one blindism contributes to a simultaneous reduction in a second untreated blindism. Hereafter, this hypothesis has been referred to as the "Concomitant" hypothesis.

Hypothesis 5: A neutral stimulus (CS) paired with an aversive stimulus (US) during initial treatment sessions serves as an effective aversive stimulus in repeated treatment sessions. Hereafter this hypothesis has been referred to as the "CS-US" hypothesis.

Hypothesis 6: The reduction of a blindism in a laboratory setting contributes to a reduced manifestation of this blindism over a period of time without further treatment. Hereafter this hypothesis has been referred to as the "Duration" hypothesis.

The hypotheses relative to the research questions were stated for each subject. In terms of the replication design, each subject represents an independent study and therefore the cases varied and hypotheses were tested subject by subject. The scope of the study permitted most of the research questions to be tested by several independent studies while two of the research questions were tested by only one independent study.

Subjects

The criteria for selecting the subjects were as follows: they were enrolled in grades 4 through 12 or equivalent; were of normal hearing; obtained I.Q.'s of not less than 80; were congenitally blind; showed visual acuity of not more than light perception; and exhibited two or more blindisms. Additionally it was necessary that permission to serve as a subject was granted by the subject, the parents, and the administration. The subjects were all selected from the Western Pennsylvania School for Blind Children which offered a population of 146 students from which to choose. Only six students met the above criteria.

These six students, two males and four females, ranged in age from 16-20 with I.Q. scores from 85 to 134. One of the students was in 9th grade, four were in 11th grade and one was in an ungraded program. Five of the students were reported to be congenitally blind due to retrolental fibroplasia and one student was congenitally blind due to optic atrophy. Finally, the visual acuities varied from no light perception in either eye to light perception in both eyes.

Settings

There were two types of settings in which treatment was administered and/or in which observations occurred. First, there was what is called hereafter the "laboratory" setting. It consisted of an unused normal classroom. The second setting was a regular classroom in which the subject was a member.

The selection of classrooms for each subject met the following criteria: the class occurred in the morning; the experimental study in that room had the approval of the principal and teacher so as not to impose an imposition on the student, teacher or school; and it was the kind of class in which the subject remained in his seat and was not restricted from engaging in the specified blindism.

So as not to disrupt the class, the teachers of the specific classes were informed as to the nature of the experiment, of the fact that observers would be visiting classes and maintaining records of the students' blindisms, and of possible behavior modification techniques to be administered within the classroom.

For T2 (see below) the classroom where the greatest incidence of the primary blindism was emitted was selected as the setting in which to administer the treatment.

Phases of the Studies

To unify discussion of the designs of the six individual case studies the notion of "phases" of observation and treatment was utilized. These phases are named and defined below. They gain added meaning as they are applied in the tables describing the design for each case in the last part of this chapter (Tables 2 through 7).

Baseline: a pre-experimental period in which the operant level of the blindism was established. Baselines were established in each of the settings on days 1 and 2 (Case 4 was an exception).

Treatment in Situation 1 (T1): the period during which the aversive stimulus, treatment (T), was first administered, in either the laboratory or classroom setting.

Treatment in Situation 2 (T2): the period during which T was administered in a second setting, in each case a classroom.

Observation (Ob): the period during which T was not administered in any setting but observations (O) occurred in classrooms.

Treatment in Situation 2 repeated (T2'): the period during which T was reinstated in the same setting as in T2.

The Behavior Modification Procedures (The Independent Variables)

In this section the behavior modification techniques are described. A description of the procedures used is included.

The Laboratory Setting

Punishment

The aversive stimulus that was used in the punishment procedure was a recording of a screeching sound of chalk on a blackboard. This aversive stimulus was presented each time the subject emitted the primary blindism and was maintained until the blindism stopped.

In the laboratory setting the subject was engaged in an activity which tended to maximize the probability of the subject exhibiting the blindisms. Therefore, subjects were engaged in the following activities: listening to pre-recorded stories; reading out loud from a braille book with soft background music, or typing via a braille writer with soft music in the background. Pre-recorded four track tapes were made with stories or music on two tracks and the aversive stimulus on the other two tracks. Each time the subject emitted the primary blindism a switch on the tape recorder was used to change from either the music or the story to the aversive stimulus. When the subject stopped emitting the blindism, the recording was again switched from the aversive stimulus back to the music or story.

Positive Reinforcement

The positive reinforcer was 75¢ given at the end of the laboratory session. This reinforcement was given for participation in the session and was not contingent on the subject's behavior during the session.

The Classroom Settings

Punishment

The "chalk screeching noise" was recorded on casette tape. The ear piece from the casette recorder was placed next to the student (on the individual's desk or ledge next to the student). When the student emitted the blindism the recorder was immediately turned on. Variations of this procedure are discussed for the specific case.

Positive Reinforcement

Positive reinforcement, as in the laboratory setting, involved the giving of 75¢, except that in the classroom settings this reward was contingent on the subject not exceeding a criterion level of the blindism. The frequency of the primary blindism on the last day in T1 was used as a base for the first treatment session in T2. The following formula was used to establish a criterion frequency for purposes of reinforcement in order that by day five of T2 the frequency would be zero: T2, day 1, Base - (.33 x Base) = X_1; day 2, Base - (.66 x Base) = X_2; day 3, Base - (.99 x Base) = X_3; and day 4, X_4 = 0. If at the end of day 1, a frequency of less than X_2 had been obtained, this frequency was used as a criterion rather than X_2 and so on.

Table 1 portrays these behavior modification techniques schematically.

TABLE 1.--Definitions of Positive Reinforcement, Punishment and Negative Reinforcement.

	Presentation	Withdrawal
Positive Reinforcer (money)	Positive Reinforcement Ex: (for not rocking)	Punishment Ex: (for rocking)
Aversive Stimulus (Chalk-screeching noise)	Punishment Ex: (for rocking)	Negative Reinforcement Ex: (for not rocking)

Punishment, the presentation of an aversive stimulus, occurred in both the laboratory and classroom settings. Punishment, as withdrawal of a positive reinforcer, occurred only in classroom settings. Positive reinforcement contingent on the reduction of blindisms occurred only in classroom settings.

Due to the abruptness of the withdrawal of the aversive stimulus (i.e., duration of less than a second), negative reinforcement was not considered to be used in this study.

Measurement of Emission of Blindisms (The Dependent Variable)

Definitions

Three blindisms were observed in this study.

Head-Rolling: repetitive side to side rotation of the head in a figure eight pattern.

Rocking: repetitive movement of the head and trunk in the frontal plane (with subject 5, for reliability, repetitive movement of the head only in the frontal plane was also scored as rocking).

Eye-Poking: contact of a finger or part of the hand with the eye.

Primary Blindism

When the subjects were selected, the frequency and duration of each of the subject's blindisms was established. The most prevalent blindism was considered the primary blindism.

Secondary Blindism

After a primary blindism was established (see above) the second most prevalent blindism was considered the secondary blindism.

Measures

There were two measures of the occurrence of a blindism: frequency, the number of times a blindism was initiated; and the elapsed time, or duration, of the blindism. Each served as a separate dependent variable. The blindisms were measured in the following way: for eye poking, for example, a frequency of one was counted, and a stop watch started each time a finger or part of the hand made contact with the eye. When the subject removed his finger or part of his hand from his eye, the timing was discontinued. The subject had to remove his hand from his eye before another frequency could be scored. Therefore, it was possible to have a frequency of one and a time of 20 minutes. The scoring of head rolling and rocking was accomplished in a similar fashion. Each time the subject began to move his trunk in the frontal plane in a rocking fashion, or, in the case of head rolling, began to rotate his head literally in a figure eight pattern, the action was counted as a frequency of one.

At the same time, the stop watch was activated. The subject had to stop these movements of head rolling or rocking for a minimum of 3 seconds in order to permit a second frequency count. The data were collected in three (3) separate and independent twenty minute (20) sessions per day. Each of these three separate sessions represented a different stimulus situation.

Observer Training and Inter-Observer Agreement

The observers participated in a training session which involved a description of the study, a video tape of samples of rocking, head rolling and eye poking behavior and observations of students (other than subjects) that exemplified the specified mannerisms. The subjects were observed from within the experimental room or the particular classroom used. The observers used the observation forms (Appendix A), stop watches, a regular watch, clip boards and pens. Inter-observer agreement was analyzed by having a second observer periodically (at least once during each phase of the study) make a simultaneous but independent observation record. Reliability was calculated by scoring each five-minute frequency count (i.e., first 5 minutes, second 5 minutes, third 5 minutes and fourth 5 minutes of the observation session) as agree or disagree, and dividing the total number of agreements by the number of agreements plus the number of disagreements (Bijou, Peterson and Ault, 1968).

Inter-observer reliability of the observation procedure was analyzed during all phases of the study for each subject which totaled 21 such occasions (once during each phase of the study for each subject). Agreement on the number of intervals scored (frequency) ranged from 79 percent to 100 percent, with a median of 97 percent.

Experimental Procedures

The experiment (baseline) was begun on the same day for all subjects except for one. However, the beginning of T1 was on the same day for all subjects. The reason for starting T1 the same for all subjects stems from the fact that since the students were living in a residential school there was a great deal of communication. Therefore, this eliminated contamination of the baseline data by one student sensitizing the other students to the observance of blindisms by the experimenter. From this point on, occurrence of the different phases for the different subjects varied, based on the time at which each subject met the specified criteria (T1) and on variations in the different independent experiments.

The duration of the studies varied from a minimum of 13 days to a maximum of 16 school days. This length of time was based upon the number of times the individual was absent or called out of classes for school business.

The Laboratory Sessions

Two observers were present during the laboratory sessions. These sessions occurred in the morning prior to the subject's attending any morning classes.

Immediately before the laboratory session on the first day of the experiment, verbal instructions containing the following points were given:

1. You have been asked to participate in an experiment at this time for the next several days.
2. You will receive 75 cents for listening to stories, typing braille, or reading out loud.
3. There will be other people in the room from time to time.
4. Do you have any questions?

Immediately before the first session of T1, the additional instructions were given to the subject: I have noticed you have a habit of (Primary Blindism) ____. Today, each time you (Primary Blindism) ____ the recording will go off. Instead you will hear this noise that sounds like chalk screeching on a blackboard (sound). As soon as you stop (Primary Blindism) ____ the story (or music) will go on again. If there are no questions, we will begin.

The Classroom Sessions

Class sizes varied from 10 to 15 students. Since the students were visually impaired, observations were made within the classroom without the students' knowledge. Since class size was small, observations were made from various locations within the classroom that allowed a satisfactory view of the subject. During each of the classroom sessions the observers were instructed to note any actions or attitudes on the part of the teacher which possibly elicited or reinforced the "blindisms" of the subject (since some of the teachers were blind, it is doubtful if there were any reinforcers given by the teachers). This information was recorded at the bottom of the observation sheet under comments (see Appendix A); however, there was no attempt to modify teacher behavior in this study.

Treatment of the Data

The hypotheses were tested by inspection of the changes in the emission of blindisms as measured by changes in frequency and time. These changes were measured by what is called here "percentage scores." A percentage score is obtained by dividing the mean score for each phase by the mean of the baseline. Thus, a percentage greater than 100 indicates an increase in a blindism, a percentage less than 100 indicates a decrease in the blindism and a percentage of 100 indicates no change. There is no accepted method for estimating the statistical significance of such changes. Instead, the significance of the changes is evaluated by a reasonable interpretation based on the magnitude of the experimental effect.

This treatment of the data represents a functional analysis of the behavior under study. A functional analysis requires a believable demonstration of the relationship between the experimental variable and the dependent variable. As Sidman (1960) points out, an experimenter has achieved an analysis of a type of behavior when he can exercise control over it. He further emphasizes that replication across successive individual subjects, each dealt with singly, is more powerful in testing reliability and generality than are replications of group data.

Further explication of the treatment of the data is included in the discussions of the individual cases that follow, and in the presentation of the findings.

The Individual Experiments

Case 1

Special Consideration.--The primary blindism was rocking and the secondary blindism was eye poking. The three stimulus situations included a laboratory session, an English class during the third period and a biology class during the fourth period. The subject was listening to recorded stories during the laboratory sessions. The experimental design consisted of only a Baseline, T1 and Ob (refer to Page 36).

Experimental Procedure.--This experiment (see Table 2) represented intrasubject direct replication (T1) and the first treatment segment of the multiple baseline technique (see Page 33).

TABLE 2.--Experimental Procedure for Case 1.

Stimulus Situation	Base- line		T1		Ob									
Laboratory Session	B	B	T	T										
Classroom 1	B	B	0	0	0	0	0	0	0	0	0	0	0	0
Classroom 2	B	B	0	0	0	0	0	0	0	0	0	0	0	0
Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14

Note: B = Baseline; 0 = Observation; T = Treatment of primary blindism.

Case 2

Special Considerations.--This subject did not participate in a laboratory session but rather three different classroom situations. Instructions were not given before the baseline; however, immediately before the first period class on the third day of the experiment (T1), the following instructions were given to the subject: "You have been asked to participate in an experiment during your first period class for the next several days. Your teacher knows that you are participating in the experiment. You will receive 75 cents for each 20 minutes of the class you participate in the experiment. This earphone is placed on your desk. I have noticed you have a habit of rocking, so today each time you rock you will hear this noise that sounds like chalk screeching on a blackboard (sound). As soon as you stop rocking, the screeching noise will stop. Do you have any questions?"

The aversive stimulus was administered via a casette tape recorder within the first classroom by placing the earphone on the subject's desk. The primary blindism was rocking and the secondary blindism was eye poking. The three stimulus situations were: a social studies class during the first period; a typing class during the second period; and an English class during the fourth period. In T2, the treatment was discontinued in Classroom 1; however, observations continued for the remainder of the experiment. The aversive stimulus was then administered via a headset controlled by a Dictaphone Classmaster Transmitter during Classroom 2.

Experimental Procedure.--This experiment (see Table 3) represented intrasubject direct replication, (T2 and T2'), systematic replication (T1 vs. T2), multiple baseline technique (see Page 33) and A-B-A-B reversal technique (Classroom 2).

TABLE 3.--Experimental Procedure for Case 2.

Stimulus Situation	Base-line		T1		T2				Ob					T2'		
Classroom 1	B	B	T	T	0	0	0	0	0	0	0	0	0	0	0	0
Classroom 2	B	B	0	0	T	T	T	T	0	0	0	0	0	T	T	T
Classroom 3	B	B	0	*	0	0	0	*	0	0	0	0	0	0	0	0
Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Note: B = Baseline; T = Treatment of primary blindism; 0 = Observation;
* = Absent from class.

Case 3

Special Considerations.--The primary blindism was rocking and the secondary mannerism was eye poking. The three stimulus situations were: laboratory session before school; an algebra class during the first period; and a history class during the second period. The subject was listening to prerecorded stories via earphones during the laboratory sessions. In Ob the experimental sessions were discontinued and the aversive stimulus was administered via casette tape recorder within Classroom 2, by placing the earphone on the student's desk.

Experimental Procedure.--This experiment (see Table 4) represented systematic replication (T1 and T2) and multiple baseline technique (see Page 33).

TABLE 4.--Experimental Procedure for Case 3.

Stimulus Situation	Baseline		T1					T2				Ob	
Laboratory Session	B	B	T	T	T	T	T						
Classroom 1	B	B	0	0	0	0	0	0	0	0	0	0	0
Classroom 2	B	B	0	0	0	0	0	T	T	T	T	0	0
Days	1	2	3	4	5	6	7	8	9	10	11	12	13

Note: B = Baseline; T = Treatment of primary blindism; 0 = Observation.

Case 4

Special Considerations.--The primary blindism was head rolling and the secondary blindism was eye poking. The three stimulus situations were: a laboratory session before school; history class during the second period; and an English class furing the third period. The subject was reading aloud from a braille book while music was playing softly in the background during the laboratory session. In T2 the experimental laboratory sessions were discontinued and the aversive stimulus was administered via casette tape recorder within classroom 1, by placing the earphone on the desk. (This subject has only one baseline score due to her absence on the first day of the experiment.)

Experimental Procedure.--This experiment (see Table 5) represented intrasubject (T1 and T2) direct replication and multiple baseline technique (see Page 33).

TABLE 5.--Experimental Procedure for Case 4.

Stimulus Situation	Baseline	T1		T2				Ob					
Laboratory Session	B	T	T										
Classroom 1	B	0	0	T	T	T	T	0	0	0	0	0	0
Classroom 2	B	0	0	0	0	0	0	0	0	0	0	0	0
Days	1	2	3	4	5	6	7	8	9	10	11	12	13

Note: B = Baseline; T = Treatment of primary blindism; 0 = Observation.

Case 5

Special Considerations.--The primary blindism was rocking (due to the inability to differentiate head nodding from rocking--both were scored as rocking) and the secondary blindism was eye poking. The three stimulus situations were a laboratory session during the first half of the first period of the school day; an English class during the second period; and a typing class during the third period. The subject was using a braille writer while music was playing softly in the background during the laboratory sessions. In T2 the experimental laboratory sessions were discontinued and the aversive stimulus was administered via a headset controlled by Dictaphone Classmaster Transmitter within Classroom 2.

Experimental Procedure.--This experiment (see Table 6) represented intrasubject (T2 and T2') direct replication, systematic replication (T1 and T2), multiple baseline technique (see Page 33) and the A-B-A-B reversal technique (baseline--T1-T2-Ob-T2').

TABLE 6.--Experimental Procedure for Case 5.

Stimulus Situations	Baseline		T1					T2				Ob		T2'		
Laboratory Session	B	B	T	T	T	T	T									
Classroom 1	B	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Classroom 2	B	B	0	0	0	0	0	T	T	T	T	0	0	T	T	T
Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Note: B = Baseline; T = Treatment of primary blindism; 0 = Observation.

Case 6

Special Considerations.--The primary blindism was rocking and the secondary blindism was eye poking. The three stimulus situations were: a laboratory session before school; an English class during the third period and a biology class during the fourth period. The subject was listening to prerecorded stories during the laboratory sessions. There was a click (produced from a toy clicker or cricket) immediately preceeding the aversive stimulus during T1. In T2 the experimental laboratory sessions before school were discontinued and the "click" only was administered in Classroom 1.

Treatment was discontinued during sessions 8 and 10 (Ob) and the subject was observed in the two classrooms for these days. During the session in Classroom 2 on day 9, the "click" (CS) was reintroduced with no prior instructions given to the subject (refer to the reversal technique page 33).

During the classroom sessions on days 11-14 (T2') the subject was instructed that during her two consecutive classes she would be observed for 20 minutes (she did not know which 20 minutes out of the possible 100 minutes). If she did not rock during that time she received one dollar. The "clicker" was no longer used. The subject was observed for the total 100 minutes; however, data was only recorded for 20 minutes out of each class or a total of 40 minutes.

Experimental Procedure.--This experiment (see Table 7) represented intrasubject (T2 and day 9--Ob) direct replication, systematic replication (T1, T2 and T2'), multiple baseline technique (see Page 33) and A-B-A-B reversal technique (Baseline--T2-T2').

TABLE 7.--Experimental Procedure for Case 6.

Stimulus Situation	Base-line		T1	T2				Ob			T2'			
Laboratory Session	B	B	T											
Classroom 1	B	B	0	T	T	T	T	0	0	0	T	T	T	T
Classroom 2	B	B	0	0	0	0	0	0	T	0	T	T	T	T
Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14

Note: B = Baseline; T = Treatment of primary blindism; 0 = Observation;

CHAPTER IV

RESULTS

Introduction

This study was undertaken to determine if the combination of punishment and positive reinforcement would be effective in the reduction of blindisms; if treatment of one blindism influences the rate of occurrence of concomitant blindisms; and if treatment effects can be generalized to non-treatment stimulus situations. The study consisted of six independent experiments which provided replication across six successive individual subjects, based upon the experimental style used by B. F. Skinner, for the purpose of providing increased support for either accepting or rejecting the hypotheses. Walker (1968) states:

> Producing a decrease in variability means increasing the quality of the experimenter's control so that factors other than the one under study cannot produce unsystematic variation in the scores. Skinner clearly chooses the latter procedure and undertakes to exert sufficient control over the behavior in question to make a statistical test unnecessary. Thus he chooses to exercise experimental rather than statistical control over his subjects. It should be obvious that this choice leads to an ultimate style of research in which a single organism is a sufficient 'group' for the establishment of a principle. Additional organisms are then tested only to determine that the principle works with all or most individuals.

In Chapter III, the general design characteristics of all six studies were stated and the individual cases were described separately to point up the unique features of each experiment.

The six hypotheses tested were stated and each given a label. Data from each of the experiments were treated separately, case by case, and the hypotheses in the particular experiment were tested. Only the labels of the hypotheses have been utilized (see Page 33). The general conclusions derived from the six experiments regarding the hypotheses are treated at the end of each case. Finally, a discussion of the results and a summary conclude this chapter.

Case Study Form

The order of presentation of information for each of the six experimental cases is as follows: the primary blindism (since eye poking was the secondary blindism for all six cases, it is not stated separately); a description of the laboratory session, classroom 1 and classroom 2: results and discussion; tables; graphs; and a summary.

For each case, the first table contains the actual data for the primary blindism and the second table contains the actual data for the secondary blindism. These tables are constructed in the following manner: each of the stimulus situations (i.e., Laboratory, Classroom 1 and Classroom 2) consists of three rows of information; schedule of the experimental procedure; frequency results in terms of the total number of occurrences of the blindism during the 20-minute session; and time results in terms of the total duration (minutes and seconds) of the blindism during the 20-minute session. The symbols in the schedule rows represent the following: B = baseline; T = Treatment of the primary blindism; and O = observation. The columns represent the following information: Baseline, a pre-treatment record of the operant level of the blindism; T1 the treatment was administered in one stimulus situation; T2, the treatment was discontinued in the first stimulus situation and administered in a second stimulus situation; Ob, all treatment was discontinued and; T2', treatment was reinstated in the same stimulus situation as in T2.

The third table contains the mean and percentage scores for the primary blindism. The fourth table contains the mean and percentage scores for the secondary blindism. These mean scores were obtained for the baseline and each of the phases for each stimulus situation. The percentage scores were obtained by dividing the mean of each phase by the baseline of that particular stimulus situation. Therefore, a percentage greater than 100 indicates an increase in the blindism, a percentage less than 100 indicates a decrease in the blindness and a percentage score of 100 indicates no change has occurred.

The cumulative frequency is presented in the first graph and the cumulative time is presented in the second graph for the primary blindism for each case. The cumulative records presented represent the cumulation of responses (i.e., frequency or time) for each day of the experiment. Therefore, rapid responding (frequency) or a continued response (time) is described as a steep slope on the cumulative record. With a decrease of the frequency of responses or the time emitting the responses, there is a corresponding decrease in the slope of the cumulative record until the curve becomes essentially horizontal, indicating no further occurrences of the blindism.

Case 1

Case 1, was an 18-year-old eleventh grade female whose primary blindism was rocking. She was involved in the following experimental situations: the laboratory session in which she listened to recorded stories; Classroom 1 which was an English class during the third period (10:20-11:10); and Classroom 2 which was a biology class during the fourth period (11:10-12:00). The experimental schedule represents the first treatment segment of the multiple baseline technique.

Results and Discussion

Case 1 tested the following hypotheses: the treatment; Laboratory Generalization; Concomitant; and the Duration hypothesis. The unique features of this experimental case included the application of treatment in only the one stimulus situation and the observation of these effects in two other stimulus situations over a period of time without further treatment.

The Treatment hypothesis was tested in this experiment in T1 of the Laboratory Session (see Table 10). The percentage scores for both frequency and time were zero (see Table 10) indicating the blindism (rocking) did not occur when the treatment schedule was in effect. That is, after the instructions and sample presentation of the aversive stimulus, the subject did not emit the blindism during the two sessions of T1. Therefore, via the instructions the subject was made aware of the operant contingency (i.e., when you rock you will hear this sound) and punishment was administered at once. Azrin and Holz (1966) state:

> How quickly does punishment reduce behavior? Virtually all studies of punishment have been in complete agreement that the reduction

TABLE 8.--Case 1: Frequency and Time Scores for the Primary Blindism Obtained in each of the Experimental Phases for each of the Stimulus Situations for Case 1.

Stimulus Situation	Baseline		T1		Ob									
Laboratory Session														
Schedule	B	B	T	T										
Results f	40	34	0	0										
Results t	11:02	9:20	0	0										
Classroom 1														
Schedule	B	B	0	0	0	0	0	0	0	0	0	0	0	0
Results f	34	32	37	16	37	0	8	5	1	0	1	0	6	10
Results t	8:58	4:46	6:32	1:06	9:01	0	:35	:45	:3	0	:5	0	1:02	1:47
Classroom 2														
Schedule	B	B	0	0	0	0	0	0	0	0	0	0	0	0
Results f	16	22	29	1	19	0	0	9	1	0	5	8	0	0
Results t	3:02	3:11	5:21	3	5:68	0	0	1:03	:5	0	:31	:17	0	0

TABLE 9.--Frequency and Time Scores for the Secondary Blindism Obtained in each of the Experimental Phases for each of the Stimulus Situations for Case 1.

Stimulus Situation	Baseline		T1		Ob									
Laboratory Session														
Schedule	B	B	0	0										
Results f	0	0	0	0										
Results t	0	0	0	0										
Classroom 1														
Schedule	B	B	0	0	0	0	0	0	0	0	0	0	0	0
Results f	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Results t	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Classroom 2														
Schedule	B	B	0	0	0	0	0	0	0	0	0	0	0	0
Results f	1	0	0	0	0	2	0	0	0	0	0	0	0	0
Results t	24	0	0	0	0	8	0	0	0	0	0	0	0	0

TABLE 10.--Case 1: Means and Percentage Scores for the Primary Blindism by Stimulus Situation and Experimental Phase.

Stimulus Situation	Baseline		Tl		Ob	
	M[1]	%[2]	M	%	M	%
Experimental Session						
f	37		0	(0)		
t	611		0	(0)		
Classroom 1						
f	33		26.5	(80.30)	6.8	(20.60)
t	412		229	(55.58)	79.8	(19.36)
Classroom 2						
f	19		15	(78.94)	4.2	(22.10)
t	186.5		162	(86.86)	42.4	(22.73)

[1]Mean scores expressed in frequency (f) and time (t) in seconds.

[2]Percentage scores are obtained by dividing the mean score for a phase by the baseline mean for the corresponding stimulus situation.

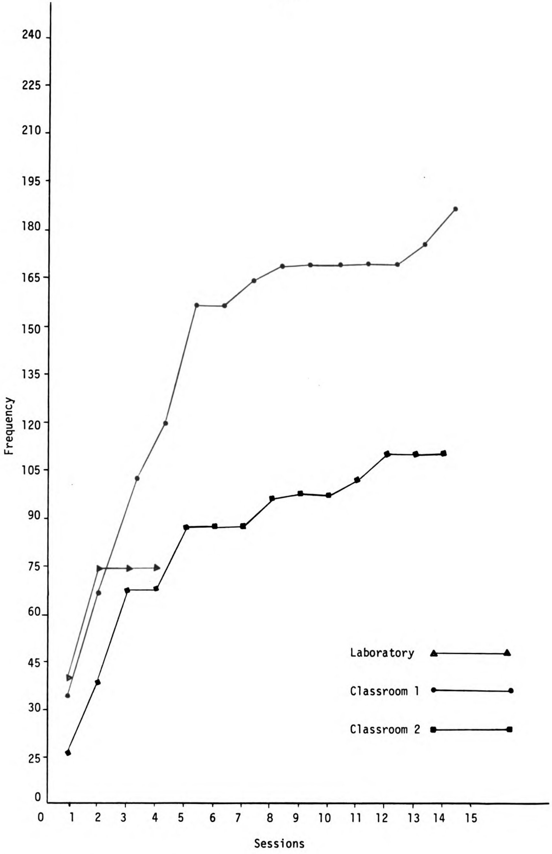

Figure 1.--Rocking: Cumulative Frequencies for Case 1.

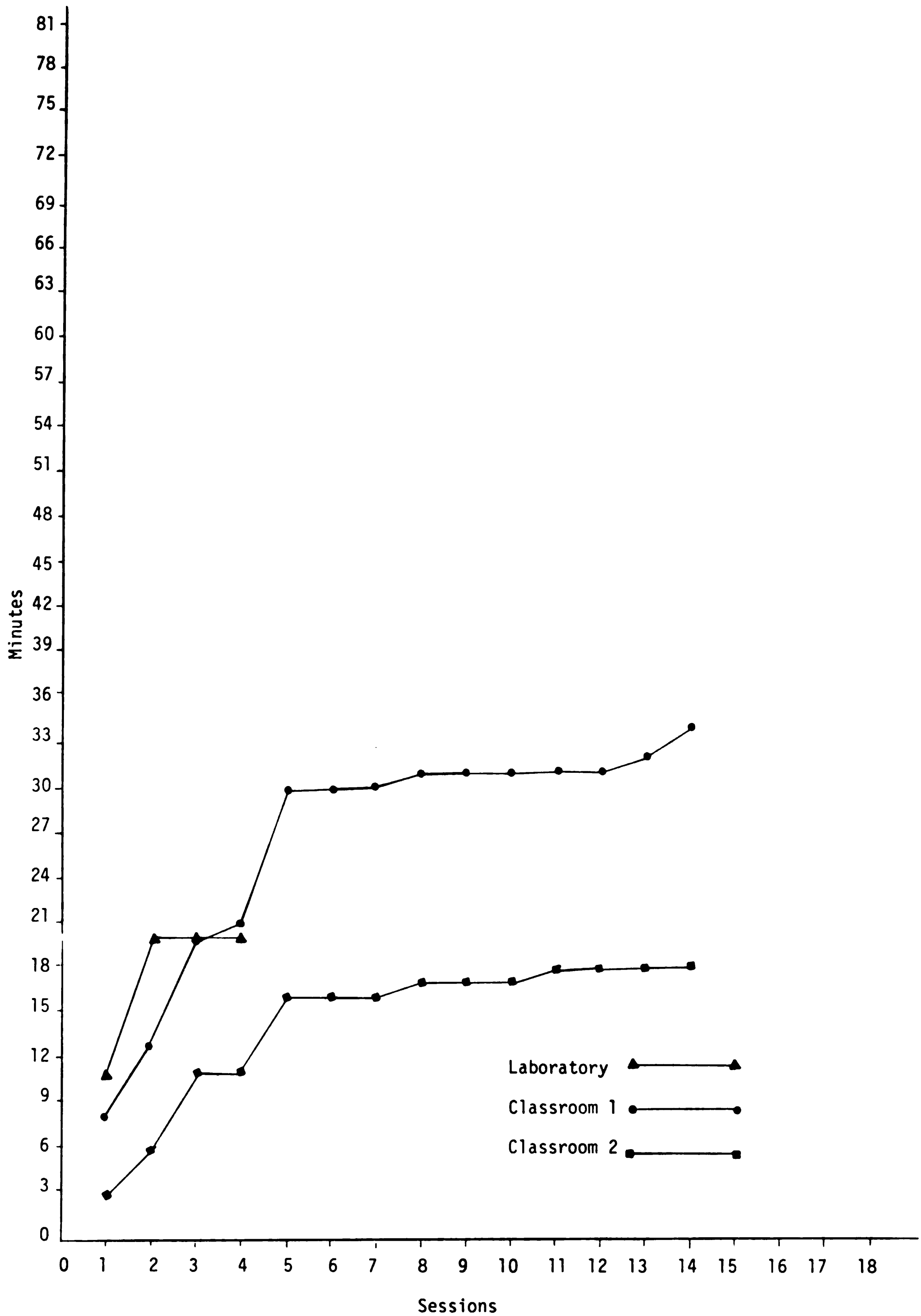

Figure 2.--Rocking: Cumulative Time in Seconds for Case 1.

> of responses by punishment is immediate of the punishment is at all effective. When the data has been presented in terms of the number of responses per day, the responses have been drastically reduced or eliminated on the very first day in which punishment was administered. When the data have been presented in terms of moment-to-moment changes, the reduction of responses has resulted within the first few deliveries of punishment (Azrin, 1956; 1959a; 1959b; 1960; Dinsmoor, 1952) or within a few minutes (Estes, 1944). The extent (Estes, 1944) and duration (Azrin, 1960b) of this initial suppression is, of course, a direct function of the intensity of punishment (p. 411).

Therefore, the immediate effects of punishment on a specific response are not unique to this case. This immediate effect of punishment was also observed in Cases 2, 4, and 6, supporting the effectiveness of the aversive stimulus used in this study.

The remarkable feature of these results, however, was the fact that this subject responded merely to the threat of punishment. In this case, for example, while the subject experienced the aversive stimulus in a demonstration, it was never administered contingent upon the occurrence of the blindism. It is difficult, therefore, to explain the success of the treatment in terms of operant conditioning theory. Also the quotations above refer to "intense" punishment. It appeared difficult to describe the aversive stimulus used in this study in these terms. Therefore, it would appear that the dramatic reduction in a blindism noted in this case, and those to be discussed below, require some explanatory principles other than those assumed in the design of this study. With this proviso in mind, these data were considered as supporting the Treatment hypothesis.

The Laboratory Generalization hypothesis was tested by the evaluation of the percentage scores of Classrooms 1 and 2 in T1 (see Table 10). The scores (frequency and time) for Classroom 1 were 80.30%

and 55.58% respectively, and in Classroom 2, the scores were 78.94% for frequency and 86.86% for time. This subject as well as the other subjects that participated in the study were not aware that they were being observed in the various classroom situations unless treatment was being administered. The data moderately supported the hypothesis concerning the generalization of effects of eliminating a behavior in a laboratory or artificial experimental situation to a classroom.

The Concomitant hypothesis was tested by the inspection of the percentage scores in T1 of the Laboratory Session (see Table 11). Blindisms have often been described as symptomatic (see Chapter II) of some underlying problems or conflicts. The assumption is that removing this symptom would cause the appearance or increase of another symptom (i.e., symptom substitution). This concept of symptom substitution has been widely accepted by therapists who follow a medical model. Yates (1970) maintains:

> In fact, the only condition in which symptom substitution would be expected to occur by behavior therapists would be the relatively rare one in which the patient had learned a number of alternative responses to anxiety as a stimulus, with all of the responses except one being inhibited. Removal of the exhibited response would then allow the response next highest in the hierarchy to appear, provided the anxiety stimulus was still present. . . . Whether response substitution does occur when the response of greatest strength is eliminated is an empirical question concerning which no evidence appears to be available at present.

While the subject had a sporadic incidence of eye poking, it was the second most frequently occurring blindism. It should be noted that in the Laboratory Session the secondary blindism did not occur, therefore, offering no data for this hypothesis. However, the data would offer evidence in opposition to the response or symptom

TABLE 11.--Case 1: Means and Percentage Scores for the Secondary Blindism by Stimulus Situation and Experimental Phase.

Stimulus Situation	Baseline		T1		Ob	
	M[1]	%[2]	M	%	M	%
<u>Experimental Session</u>						
f	0		0	(0)		
t	0		0	(0)		
<u>Classroom 1</u>						
f	0		0	(0)	0	(0)
t	0		0	(0)	0	(0)
<u>Classroom 2</u>						
f	.5		0	(0)	.2	(40)
t	12		0	(0)	.8	(6.66)

[1]Mean scores expressed in frequency (f) and time (t) in seconds.

[2]Percentage scores are obtained by dividing the mean score for a phase by the baseline mean for the corresponding stimulus situation.

substitution concept since the most prevalent blindism was eliminated the second most prevalent blindism did not increase nor did any new blindism appear.

It was possible, of course, that unobserved behavioral symptoms other than a blindism increased following reduction of the primary blindism, and thus the symptom substitution hypothesis cannot be rejected. To assume otherwise would be to argue that the invariable substitute for one blindism would be another blindism, an untenable position to maintain. Nevertheless, the finding was suggestive in that it was reasonable to postulate that blindisms share the characteristic of being repetitive, apparently "non-functional," releases of energy and to assume that if one outlet was blocked a similar outlet already in the individual's behavioral repertoire would be the most likely substitute.

However, in this case the almost total absence of the secondary blindism during the entire study, including most of the baseline sessions, provides only weak support for the hypothesis. It would seem a more powerful test if the secondary blindism had occurred at some frequency which then did not increase as the primary blindism diminished. As it was, the strength of eye poking as a likely substitute was in question.

The Duration hypothesis was tested by the inspection of the percentage scores in Ob for Classrooms 1 and 2. The scores for Classroom 1 were 20.60% for frequency and 19.36% for time. The frequency and time scores for Classroom 2 were 22.10% and 22.73% respectively. It should be noted on day 5 of the experiment (see Table 10) or the first day of Ob, the frequency and times for both Classroom 1 and 2 were higher than the baseline scores. This occurrence is sometimes referred to as "spontaneous recovery," "remission," and "post treatment relapse" and has been interpreted as a result of response suppression. The response suppression stems from an aversive stimulus being used to condition or temporarily suppress one class of responses while another was strengthened. Response recovery occurs in such instances as when a short conditioning period has been used or as Azrin (1956) stated that unless the punishment has been very severe, responding not only recovers when punishment was discontinued but it actually exceeds the unpunished rate for a period of time. Reese (1966) maintains that punishment is more effective in suppressing behavior if an alternative response is available than if only the punished response is available. While this subject exhibited a response recovery above the baseline, this behavior was not emitted on the following day (day 6). The data from Ob supported the Duration hypothesis.

Summary

The data from Case 1 supports the Treatment hypothesis as the blindism did not occur when the treatment schedule was in effect. The percentage scores in Classroom 1 and 2 were less than 100 during Phase I supporting the Laboratory Generalization hypothesis. Due to the sporadic incidence of the secondary blindism there were no data to support or reject the Concomitant hypothesis; however, the data would dispute the principle of response substitution. Finally, the Duration hypothesis was supported.

Case 2

Case 2 was a 16-year-old ninth grade female whose primary blindism was rocking. She was involved in the following experimental situations: Classroom 1 which was a social studies class during the first period (8:30-9:20); Classroom 2 was a typing class during the second period (9:20-10:10); and Classroom 3 which was an English class during the fourth period (11:10-12:00). The experimental schedule represents systematic replication (T1 vs. T2), multiple baseline techniques and an A-B-A-B reversal technique (Classroom 2).

Results and Discussion

This case tested the Treatment and Concomitant hypotheses as did Case 1 and also the Classroom Generalization hypothesis. One of the unique factors of Case 2 involved three Classroom situations as opposed to a Laboratory Session and only 2 Classroom situations. This offered additional data relating to the Classroom Generalization hypothesis.

The Treatment hypothesis was tested by the inspection of the percentage scores in T1 of Classroom 1, T2 of Classroom 2 and T2' of Classroom 2 (see Table 14). The frequency scores were 1.75%, 16.10% and 31.62% and the time scores were 0.18%, 0.85% and 1.29% respectively. This case tested the Treatment hypothesis in two different classrooms. Also, by using the reversal technique the treatment was administered in Classroom 2 (T2) and then discontinued (Ob) later reinstated in T2'. In each of the situations where the treatment was administered, both frequency and time decreased. Further support for the effects of the

TABLE 12.--Frequency and Time Scores for the Primary Blindism Obtained in each of the Experimental Phases for each of the Stimulus Situations for Case 2.

Stimulus Situation	Baseline		T1		T2				Ob					T2'		
Classroom 1																
Schedule	B	B	T	T	0	0	0	0	0	0	0	0	0	0	0	0
Results f	24	33	1	0	4	26	2	25	14	14	9	4	12	11	15	1
Results t	3:03	5:45	1	0	23	4:55	6	2:27	1:25	1:26	25	30	2:49	1:24	3:19	20
Classroom 2																
Schedule	B	B	0	0	T	T	T	T	0	0	0	0	0	T	T	T
Results f	37	22	45	24	13	5	1	0	50	44	28	23	49	15	7	6
Results t	13:39	14:37	8:12	2:58	17	11	1	0	12:29	10:06	3:14	2:09	13:46	18	9	6
Classroom 3																
Schedule	B	B	0	*	0	0	0	*	0	0	0	0	0	0	0	*
Results f	10	43	35		11	37	12		34	16	23	14	19	9	6	
Results t	58	11:05	3:45		51	6:36	2:46		9:41	1:50	10:26	2:20	4:17	1:31	45	

TABLE 13.--Frequency and Time Scores for the Secondary Blindism Obtained in each of the Experimental Phases for each of the Stimulus Situations for Case 2.

Stimulus Situation	Baseline		T1		T2				Ob					T2'		
Classroom 1																
Schedule	B	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Results f	4	8	1	0	0	3	0	0	1	2	0	0	1	0	0	0
Results t	20	32	1	0	0	13	0	0	2	6	0	0	2	0	0	0
Classroom 2																
Schedule	B	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Results f	3	5	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Results t	3	5	0	0	0	0	0	0	0	0	0	0	0	0	4	0
Classroom 3																
Schedule	B	B	0	*	0	0	0	*	0	0	0	0	0	0	0	*
Results f	9	3	10		0	1	4		5	0	1	3	0	1	10	
Results t	1:02	18	1:39		0	8	17		44	0	1	18	0	2	2:25	

TABLE 14.--Case 2: Means and Percentage Scores for the Primary Blindism by Stimulus Situation and Experimental Phase.

Stimulus Situation	Baseline		T1		T2		Ob		T2'	
	M[1]	%[2]	M	%	M	%	M	%	M	%
Classroom 1										
f	28.5		.5	(1.75)	14.25	(50)	10.6	(37.19)	9	(31.57)
t	264		.5	(.18)	117.75	(44.6)	79	(29.92)	101	(38.25)
Classroom 2										
f	29.5		34.5	(116.94)	4.75	(16.10)	38.8	(131.52)	9.33	(31.62)
t	848		335	(39.5)	7.25	(.85)	500.8	(59.05)	11	(1.29)
Classroom 3										
f	26.5		35	(132.07)	20	(75.47)	21.2	(80)	7.5	(28.91)
t	361.5		225	62.24	204.33	(56.52)	342.8	(94.82)	68	(18.81)

[1]Mean scores expressed in frequency (f) and time (t) in seconds.

[2]Percentage scores are obtained by dividing the mean score for a phase by the baseline mean for the corresponding stimulus situation.

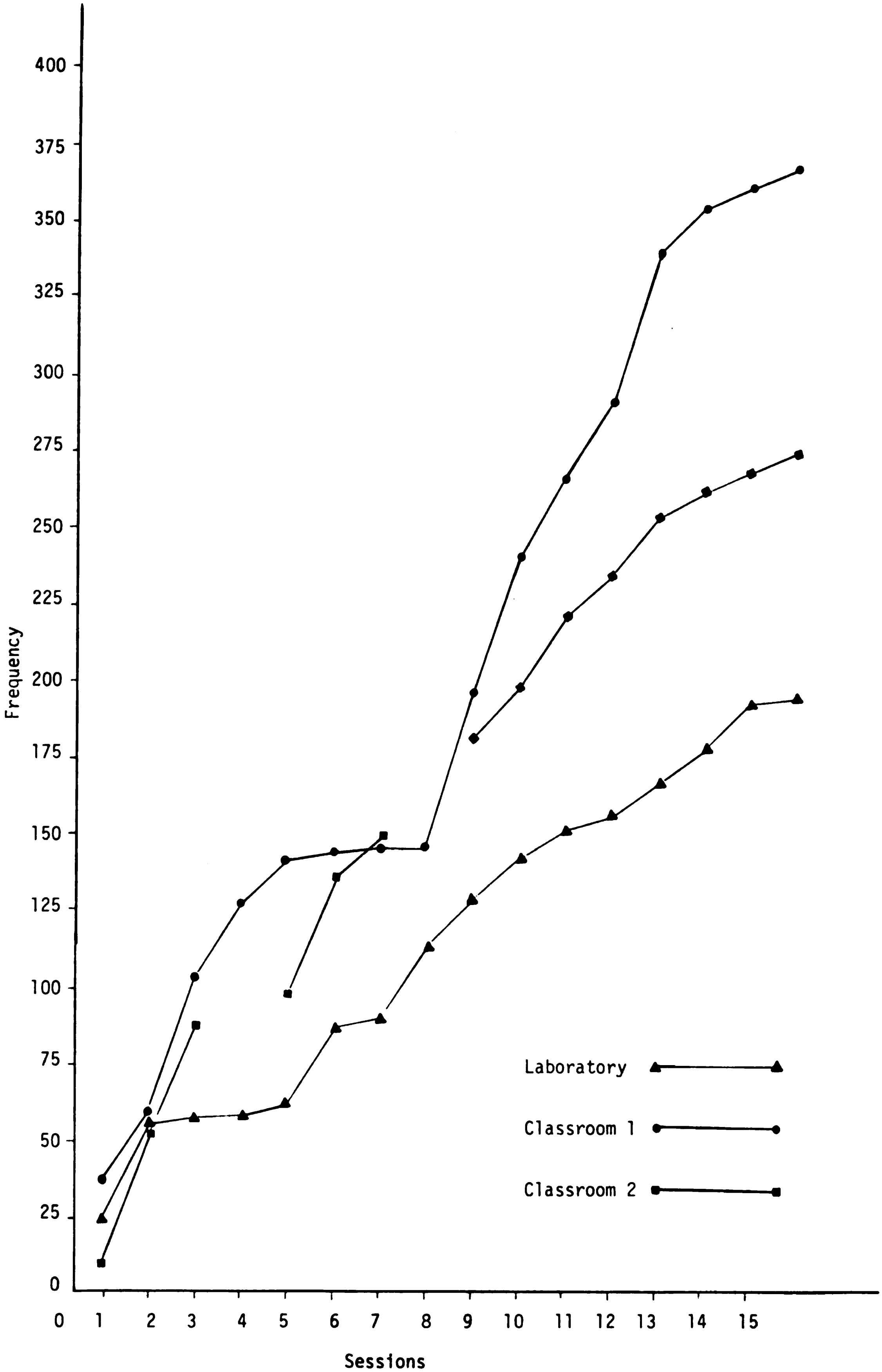

Figure 3.--Rocking: Cumulative Frequencies for Case 2.

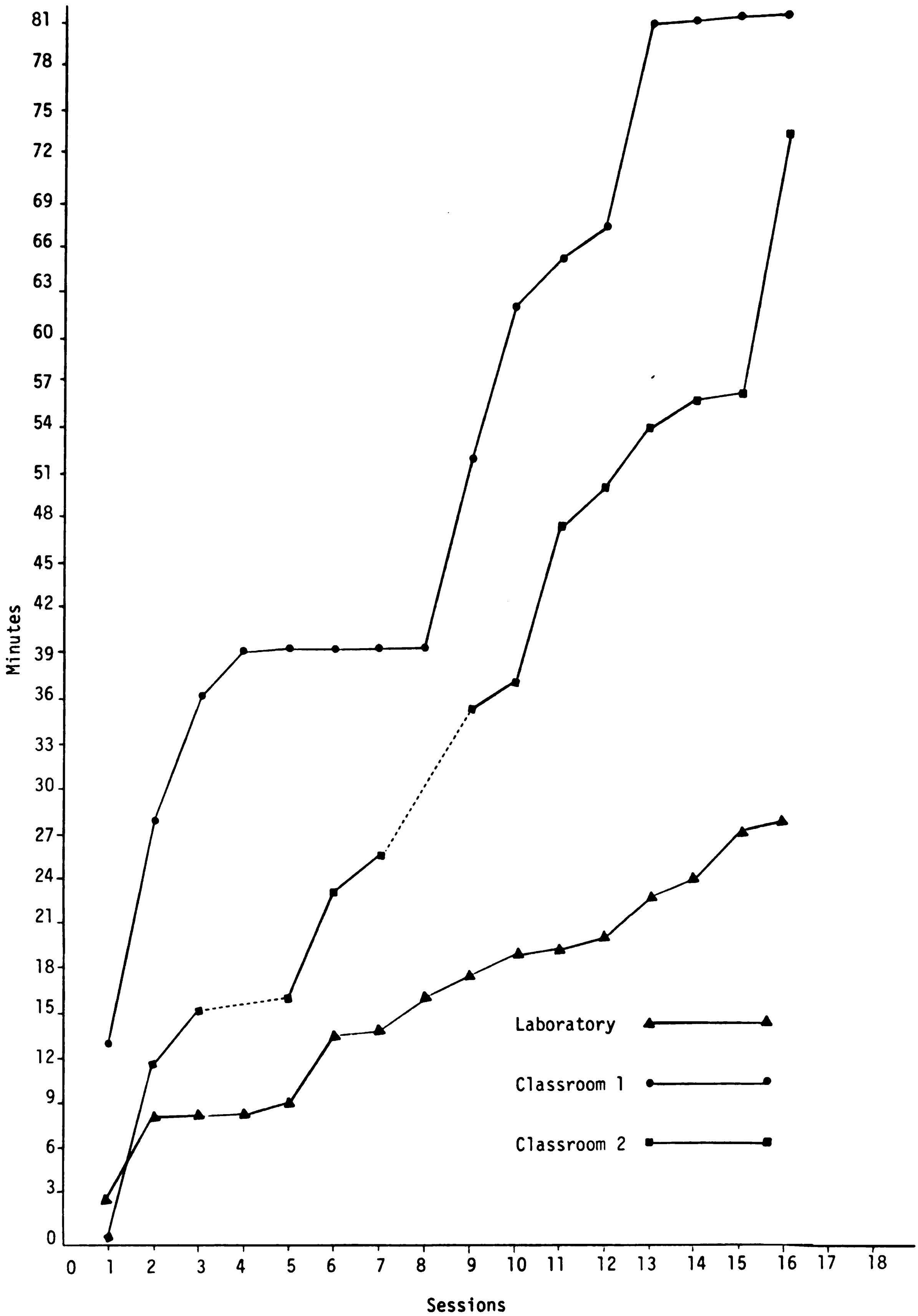

Figure 4.--Rocking: Cumulative Time in Seconds for Case 2.

treatment was demonstrated by T2 of Classroom 2 where the treatment was introduced and the incidence of the blindism was reduced to zero. In Ob of Classroom 2 the treatment was discontinued and the incidence increased above the baseline in frequency. When the treatment was again administered in T2' the incidence of the blindism again decreased. This demonstrated the effects of the treatment and along with Case 1, supported the principle that the application of punishment and positive reinforcement reduced the incidence of a blindism.

The Classroom Generalization hypothesis was tested by the inspection of the following percentage scores: T1 of Classrooms 2 and 3; and Phase T2 and T2' of Classroom 3 (see Table 14). The frequency scores of Classrooms 2 and 3 of T1 were 116.95% and 132.07% respectively, while during this same Phase the time scores were 39.5% for Classroom 2 and 62.24% for Classroom 3. In this case, the subject would begin to exhibit the rocking behavior and then stop very abruptly. This was in contrast to the initiating of the blindism, emitting the blindism over a period of time and gradually fading the blindism out until it stopped. This seemed to be an indication that the blindism was being extinguished (i.e., higher frequency but a shorter time duration). The frequency scores of Classroom 3 for T2 and T2' were 75.57% and 28.91% respectively, while the time scores for these same Phases were 56.52% and 18.81% respectively. There may be a generalization of effects from T1 to Phase T2 and again to Phase T2'. While there may be some cumulation of effects it was felt that these effects are not very great. When treatment was first introduced in Classroom 1, there was a decrease in time but not frequency in Classrooms 2 and 3. However, when the treatment

TABLE 15.--Case 2: Means and Percentage Scores for the Secondary Blindism by Stimulus Situation and Experimental Phase.

Stimulus Situation	Baseline		T1		T2		Ob		T2'	
	M[1]	%[2]	M	%	M	%	M	%	M	%
Classroom 1										
f	6		.5	(8.33)	.75	(12.5)	.8	(13.33)	0	(0)
t	26		.5	(1.92)	3.25	(12.5)	2	(7.69)	0	(0)
Classroom 2										
f	4		0	(0)	0	(0)	0	(0)	.33	(20.75)
t	4		0	(0)	0	(0)	0	(0)	1.33	(33.25)
Classroom 3										
f	6		10	(166.66)	1.25	(20.83)	1.8	(30)	5.5	(91.66)
t	40		99	(247.5)	8.33	(20.82)	12.6	(31.5)	147	(367.5)

[1]Mean scores expressed in frequency (f) and time (t) in seconds.

[2]Percentage scores are obtained by dividing the mean score for a phase by the baseline mean for the corresponding stimulus situation.

was introduced (Phase T2 and T2') in Classroom 2 there was an accompanying decrease in the frequency and time of the blindism in Classroom 3. Therefore, the data from this case moderately supports the hypothesis that there was a generalized reduction of a blindism (frequency, in part, and time) from one classroom to another.

The Concomitant hypothesis was tested by the inspection of the following percentage scores: Phase T1 of Classroom 1; and T2 and T2' of Classroom 2 (see Table 15). The respective scores for frequency were 8.33%, zero and 20.75% and for time were 1.92%, zero and 33.25%. These scores which were less than 100% establishes the principle that the treatment and reduction of one blindism contributes to a simultaneous reduction in a second untreated blindism. This data also agreed with Case 1 and offered evidence refuting the response or symptom substitution concept (refer to discussion of Case 1).

In summary, the results of Case 2 were in agreement with Case 1 regarding the Treatment hypothesis. Further support was offered by the use of the reversal technique used in Case 2. The results in terms of time, supported the Classroom Generalization hypothesis; however, the frequency during Phase T1 increased but later decreased during Phases T2 and T2'. The data in Case 2 also offered support for the Concomitant hypothesis as well as agreeing with Case 1 in refuting the response or symptom substitution concept.

Case 3

Case 3 was a 19-year-old eleventh grade male whose primary blindism was a violent rocking. The subject rocked to the extent of moving whatever chair or desk he was seated in. He was involved in the following experimental situations: laboratory session during which the subject listened to prerecorded stories via earphones before the first period of the school day; Classroom 1 which was an algebra class during the first period (8:30-9:20) and Classroom 2 was a history class during the second period (9:30-10:10). The experimental schedule represents systematic replication (T1 and T2) and a multiple baseline technique.

Results and Discussion

This case tested the Treatment hypothesis, the Laboratory Generalization hypothesis and the Concomitant hypothesis. The unique feature of Case 3 is primarily the use of earphones during the Laboratory Session. The rational for using the earphones was based on three factors: (1) the subject's familiarity with listening via earphones (i.e., the familiarity of the stimulus situation); (2) testing the feasibility of administering treatment via earphones when students were using such devices as a talking book machine during their daily routine at the School for the Blind; and (3) investigating the possibility of using earphones when administering the treatment in classrooms so as not to disrupt the class.

The Treatment hypothesis was tested by the inspection of the percentage scores in Phase T1 of the Laboratory Session and Phase T2 of Classroom 2. The frequency scores for these Phases were 35% and 4.5% respectively, and the time scores were 2.5% and zero (rounded off to three places). When treatment was administered in the Laboratory

Session, the subject continued to emit the blindism (see Table 16) on the fifth day of T1 (frequency-2 and time - 2 sec.).

During these sessions, the subject was given the most valued (the recorded stories were not as reinforcing as the money) positive reinforcer contingent upon attending the sessions and not on a specified goal (i.e., frequency of blindism) set at the beginning of the session. Therefore, while the use of punishment greatly reduced the incidence of the blindism (frequency 35% and time 4.5%) it did not completely eliminate the blindism for one 20-minute session.

In Phase T2 where the combination of punishment and positive reinforcement was used, there were two twenty-minute sessions where the subject did not emit the blindism. However, there may be a generalization of effects from T1 to T2 and, therefore, the zero emittance of the blindism may not be entirely attributed to the punishment and positive reinforcement schedule. Yet, the results obtained in T1 of the Laboratory Session and T2 of Classroom 2 offer additional support for the Treatment hypothesis.

The Laboratory Generalization hypothesis was tested by the inspection of the percentage scores in T1 in Classrooms 1 and 2. The respective frequency scores were 85.5% and 92.7% and the time scores were 31.7% and 75.6% respectively. The percentage scores were less than 100 and, therefore, moderately support the principle of the generalization of effects obtained in a laboratory situation to classroom situations.

The Classroom Generalization hypothesis was tested by evaluating the scores in T2 of Classroom 1. These particular frequency and time

TABLE 16.--Frequency and Time Scores for the Primary Blindism Obtained in each of the Experimental Phases for each of the Stimulus Situations for Case 3.

Stimulus Situation	Baseline		T1					T2				Ob	
Laboratory Session													
Schedule	B	B	T	T	T	T	T						
Results f	11	13	14	1	2	2	2						
Results t	1:34	2:18	6	1	2	2	2						
Classroom 1													
Schedule	B	B	0	0	0	0	0	0	0	0	0	0	0
Results f	13	23	13	19	11	8	16	4	8	13	7	11	6
Results t	2:48	13:25	58	2:56	2:17	1:00	6:00	15	30	4:26	1:07	2:33	52
Classroom 2													
Schedule	B	B	0	0	0	0	0	T	T	T	T	0	0
Results f	5	17	8	9	13	8	13	1	0	1	0	8	16
Results t	19:44	14:17	12:33	19:10	12:75	13:57	5:55	1	0	1	0	9:04	18:16

TABLE 17.--Frequency and Time Scores for the Secondary Blindism Obtained in each of the Experimental Phases for each of the Stimulus Situations for Case 3.

Stimulus Situation	Baseline		T1					T2				Ob	
Laboratory Session													
Schedule	B	B	0	0	0	0	0						
Results f	12	5	4	1	11	14	14						
Results t	2:45	1:53	28	47	10:12	7:37	14:10						
Classroom 1													
Schedule	B	B	0	0	0	0	0	0	0	0	0	0	0
Results f	6	9	12	22	18	18	17	11	14	7	13	16	6
Results t	2:28	1:12	2:12	7:58	6:02	6:28	4:55	4:19	3:40	2:35	4:22	4:49	34
Classroom 2													
Schedule	B	B	0	0	0	0	0	0	0	0	0	0	0
Results f	0	7	1	1	0	1	10	2	7	0	9	2	2
Results t	0	53	12	16	0	10	7:03	7	24	0	4:50	1:52	9

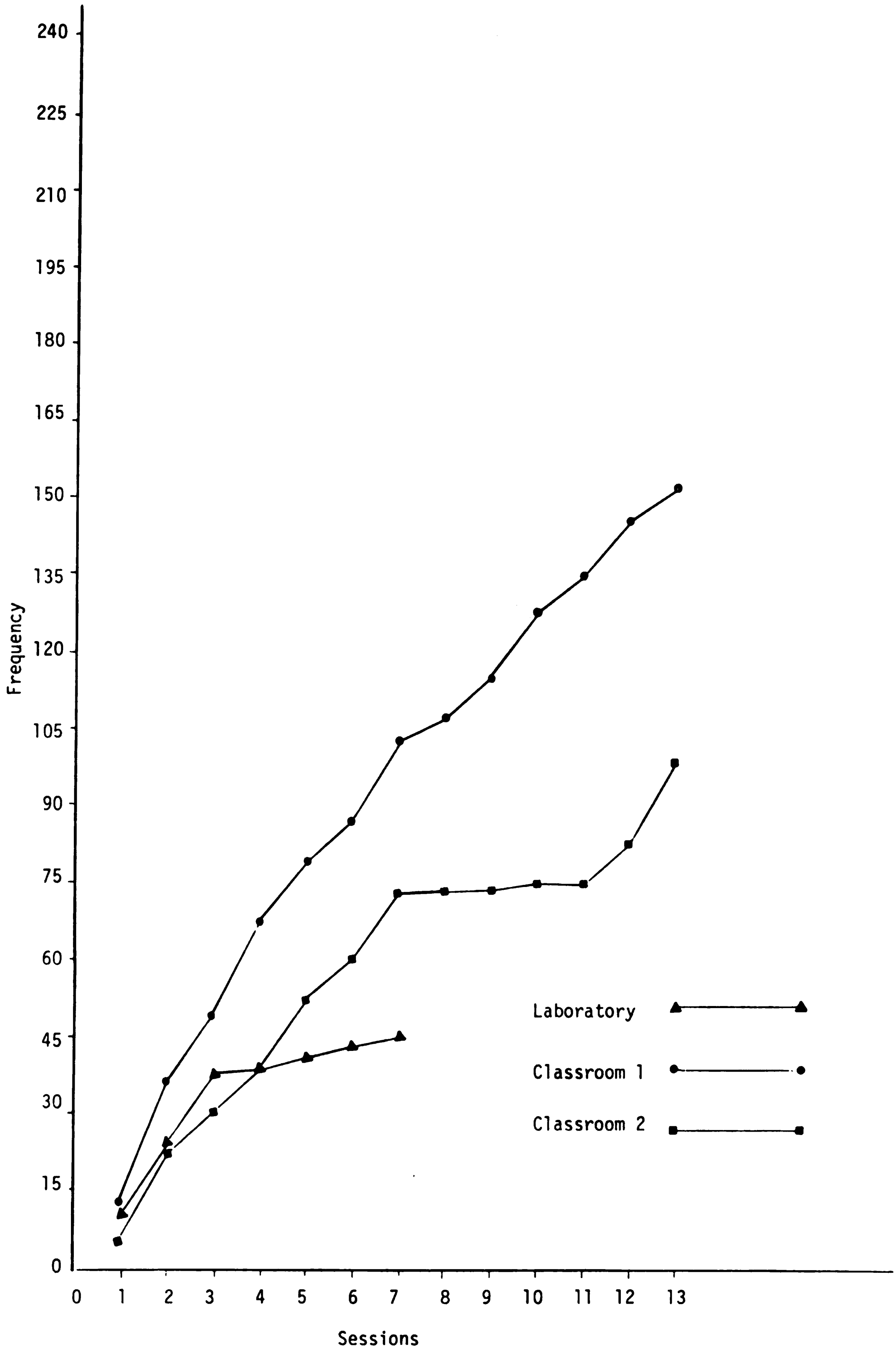

Figure 5.--Rocking: Cumulative Frequencies for Case 3.

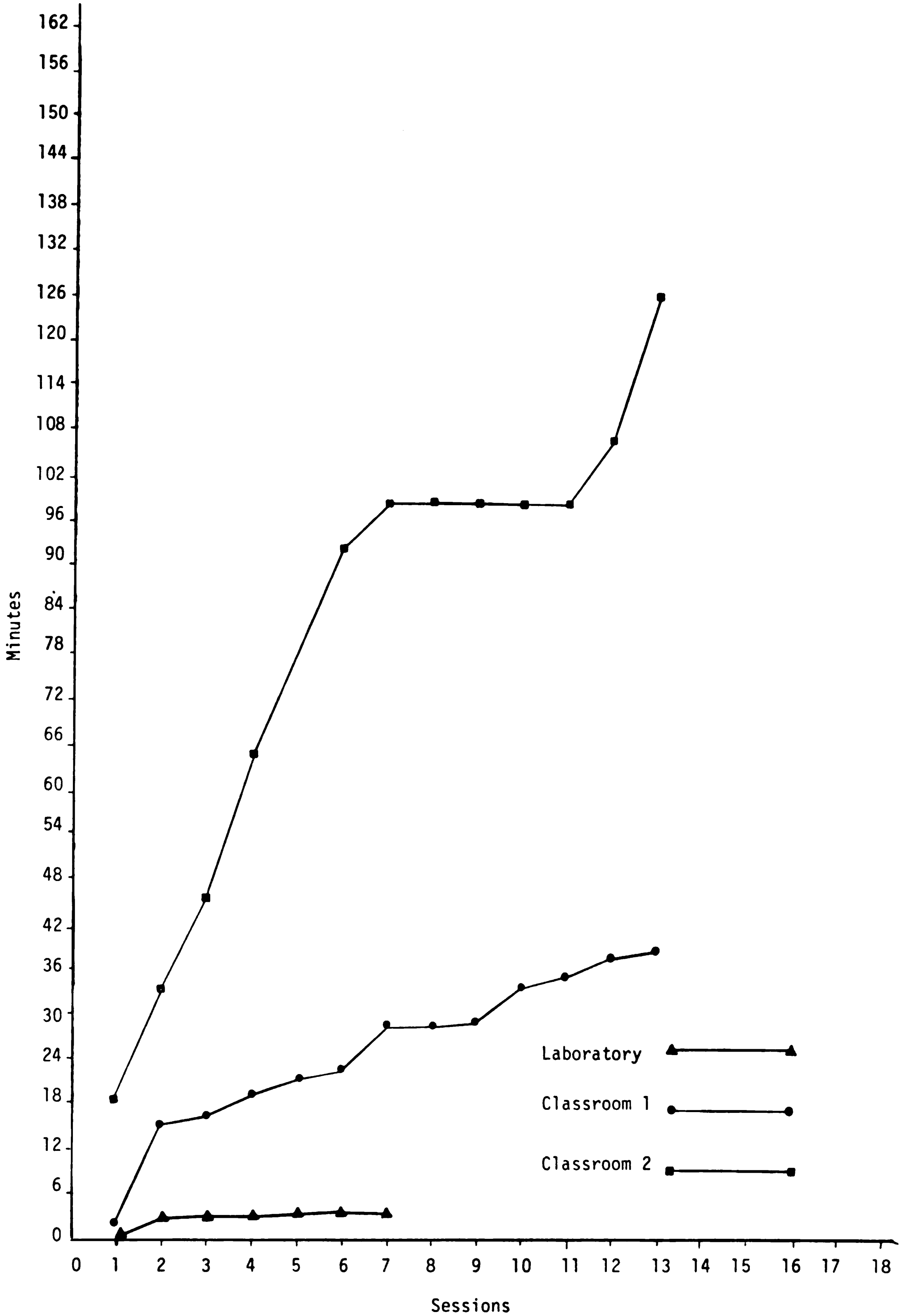

Figure 6.--Rocking: Cumulative Time in Seconds for Case 3.

scores were 44.4% and 19.3% respectively. Again, it should be pointed out that there may be a cumulation of effects from T1 that contributes to the results obtained in T2 of Classroom 1. While this may be a possibility, the cumulative effect would be slight. Nonetheless, the results supported the principle that the reduction of a blindism in one classroom contributed to a simultaneous reduction of the blindism in other classrooms.

The Concomitant hypothesis was tested by the scores for the secondary blindism in T1 of the Laboratory Session and in T2 of Classroom 2. The percentage score in T1 for the frequency was 103.5% and the time score was 286.5%. In T2 the score for the frequency was 128.5% and the time score was 307.3%. As previously stated, the primary blindism for the subject was a very violent rocking. The secondary blindism of eye-poking was an incompatible behavior with the rocking since this subject would generally swing both arms in a flexion-hyperextension motion that was synchronized with the extension-flexion motion, respectively, of the trunk. The subject would put his fingers or some part of the hand in his eyes and then, when he would put his hands down to his sides, he would begin rocking. Therefore, as the subject exhibited a decrease in the primary, treated blindism there was a simultaneous increase in the untreated secondary blindism. Therefore, the results do not support the Concomitant hypothesis.

In summary, Case 3 was in agreement with Cases 1 and 2 and the results support the Treatment hypothesis. The results of Case 3 also agree with the principle moderately supported by Case 1 as stated in the Laboratory Generalization hypothesis. Case 3 offers additional moderate

TABLE 18.--Case 3: Means and Percentage Scores for the Primary Blindism by Stimulus Situation and Experimental Phase.

Stimulus Situation	Baseline		T1		T2		Ob		T2'	
	M[1]	%[2]	M	%	M	%	M	%	M	%
<u>Experimental Session</u>										
f	12		4.2	(35)						
t	116		3	(2.5)						
<u>Classroom 1</u>										
f	18		15.4	(85.5)	8	(44.4)	8.5	(47.2)		
t	486		154	(31.7)	94	(19.3)	102	(23)		
<u>Classroom 2</u>										
f	11		10.2	(92.7)	.5	(4.5)	12	(109)		
t	1020		772	(75.6)	.5	(0)	820	(80.3)		

[1]Mean scores expressed in frequency (f) and time (t) in seconds.

[2]Percentage scores are obtained by dividing the mean score for a phase by the baseline mean for the corresponding stimulus situation.

TABLE 19.--Case 3: Means and Percentage Scores for the Secondary Blindism by Stimulus Situation and Experimental Phase.

Stimulus Situation	Baseline		T1		T2		Ob		T2'	
	M[1]	%[2]	M	%	M	%	M	%	M	%
Experimental Session										
f	8.5		8.8	(103.5)						
t	139		398	(286.5)						
Classroom 1										
f	7.5		17.4	(232)	11.2	(149.4)	11	(146.6)		
t	110		331	(300.9)	224	(203.6)	161	(146.3)		
Classroom 2										
f	3.5		2.6	(74.2)	4.5	(128.5)	2	(57.1)		
t	26		92	(353.4)	80	(307.3)	60	(230.7)		

[1]Mean scores expressed in frequency (f) and time (t) in seconds.

[2]Percentage scores are obtained by dividing the mean score for a phase by the baseline mean for the corresponding stimulus situation.

support to the Classroom Generalization hypothesis as tested by Case 2. Finally, the results of Case 3 regarding the Concomitant hypothesis were in disagreement with those of Case 2. Case 3 did not support the Concomitant hypothesis.

Case 4

Case 4 was a 17-year-old eleventh grade female whose primary blindism was head rolling, a side-to-side figure "8" movement. She was involved in the following experimental situations: Laboratory session before the first period during which the subject read aloud from a braille book while music was playing softly in the background; Classroom 1 was a history class during the second period (9:20-10:10); and Classroom 2 was an English class during the third period (10:20-11:10). The experimental schedule represents intrasubject (Phase T1 and Phase T2) direct replication and the multiple baseline technique.

Results and Discussion

Case 4 tested the following hypothesis: Treatment; Laboratory Generalization; Classroom Generalization; and the Concomitant hypothesis.

The Treatment hypothesis was tested by the scores represented in T1 of the Laboratory Session and in T2 of Classroom 1. The results for frequency and time for each of these Phases were zero. Therefore, no responses were emitted when the treatment was contingent upon head rolling. The blindism was not emitted during the baseline or during T1 or T2 in Classroom 1. Therefore, there was no data for testing this hypothesis during T2 of Classroom 1. Yet during Ob when all treatment had been discontinued there was a sporadic incidence of the blindism.

Due to the sporadic occurrence of the blindism during this stimulus situation, it would have been of value to obtain a baseline based on several days of observation. It may be that certain classes, teachers or stimuli elicit the blindisms more readily than other apparently similar situations. For example, this subject would emit the primary blindism almost constantly when talking aloud, walking and at certain times when she was involved in a conversation. The subject was, in fact, involved in a conversation on the first day of Ob (frequency - 9 and time - 1:06) when there was the first occurrence of the primary blindism.

During the baseline of the Laboratory Session, the frequency was 64 and the time was 11 minutes and 5 seconds. After the instructions and presentation of the aversive stimulus at the beginning of T1 were presented, the subject did not emit the blindism during the two sessions of T1. This "one-trial learning" also occurred in Cases 1, 2, and 6. Therefore, the immediate effects of punishment on a specific response were not unique to this case (see Case 1, pages 56 and 62 for discussion of this effect). The results of the Laboratory Session for Case 4 support the Treatment hypothesis and the effectiveness of the aversive stimulus.

The Laboratory Generalization hypothesis was tested by the evaluation of the percentage scores of T1 in Classrooms 1 and 2 (see Table 22). As stated previously, since the blindism was not emitted during the baseline nor during T1, no data was obtained from Classroom 1 for testing the hypothesis. The scores for frequency and time in Classroom 2 were 116% and 50% respectively. The discrepancy between

TABLE 20.--Frequency and Time Scores for the Primary Blindism Obtained in each of the Experimental Phases for each of the Stimulus Situations for Case 4.

Stimulus Situation	Base-line	T1		T2				Ob						
<u>Laboratory Session</u>														
Schedule	B	T	T											
Results f	64	0	0											
Results t	11:05	0	0											
<u>Classroom 1</u>														
Schedule	B	0	0	T	T	T	T	0	0	0	0	0	0	0
Results f	0	0	0	0	0	0	0	9	2	0	0	2	2	0
Results t	0	0	0	0	0	0	0	1:06	4	0	0	1	13	0
<u>Classroom 2</u>														
Schedule	B	0	0	0	0	0	0	0	0	0	0	0	0	0
Results f	3	7	0	1	0	0	0	0	2	1	0	0	5	0
Results t	15	15	0	2	0	0	0	0	7	4	0	0	22	0

TABLE 21.--Frequency and Time Scores for the Secondary Blindism Obtained in each of the Experimental Phases for each of the Stimulus Situations for Case 4.

Stimulus Situation	Base-line	T1		T2				Ob						
<u>Laboratory Session</u>														
Schedule	B	0	0											
Results f	0	0	0											
Results t	0	0	0											
<u>Classroom 1</u>														
Schedule	B	0	0	0	0	0	0	0	0	0	0	0	0	0
Results f	2	0	1	0	0	0	4	11	0	0	0	0	0	0
Results t	4	0	1	0	0	0	4	9	0	0	0	0	0	0
<u>Classroom 2</u>														
Schedule	B	0	0	0	0	0	0	0	0	0	0	0	0	0
Results f	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Results t	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 22.--Case 4: Means and Percentage Scores for the Primary Blindism by Stimulus Situation and Experimental Phase.

Stimulus Situation	Baseline		T1		T2		Ob		T2'	
	M[1]	%[2]	M	%	M	%	M	%	M	%
<u>Experimental Session</u>										
f	64		0	(0)						
t	665		0	(0)						
<u>Classroom 1</u>										
f	0		0	(0)	0	(0)	2.42	[2.42]		
t	0		0	(0)	0	(0)	12	[12]		
<u>Classroom 2</u>										
f	3		3.5	(116)	.25	(8.3)	1.14	(38)		
t	15		7.5	(50)	.5	(3.3)	4.71	(31.4)		

[1]Mean scores expressed in frequency (f) and time (t) in seconds.

[2]Percentage scores are obtained by dividing the mean score for a phone by the baseline mean for the corresponding stimulus situation.

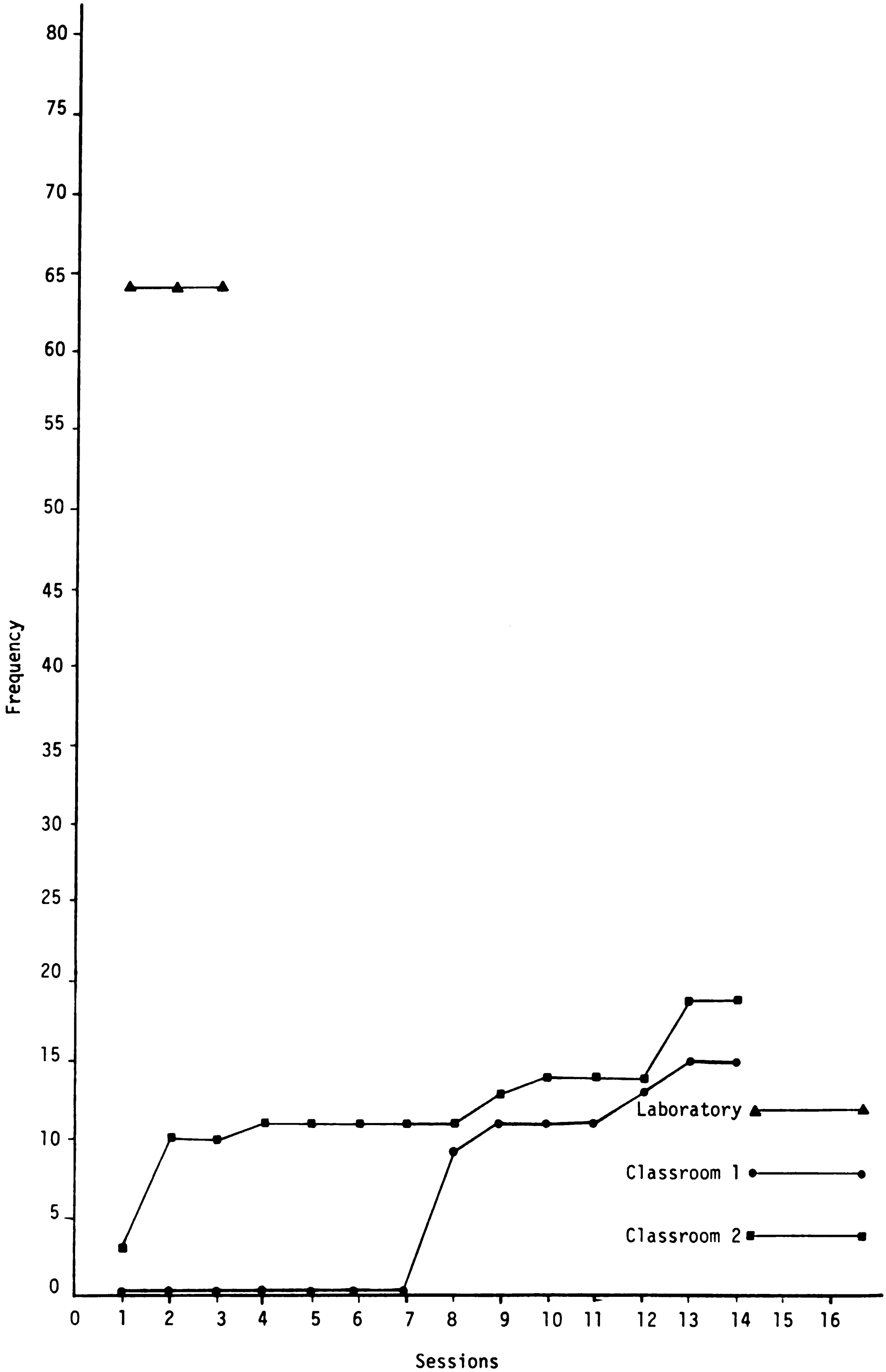

Figure 7.--Head Rolling: Cumulative Frequencies for Case 4.

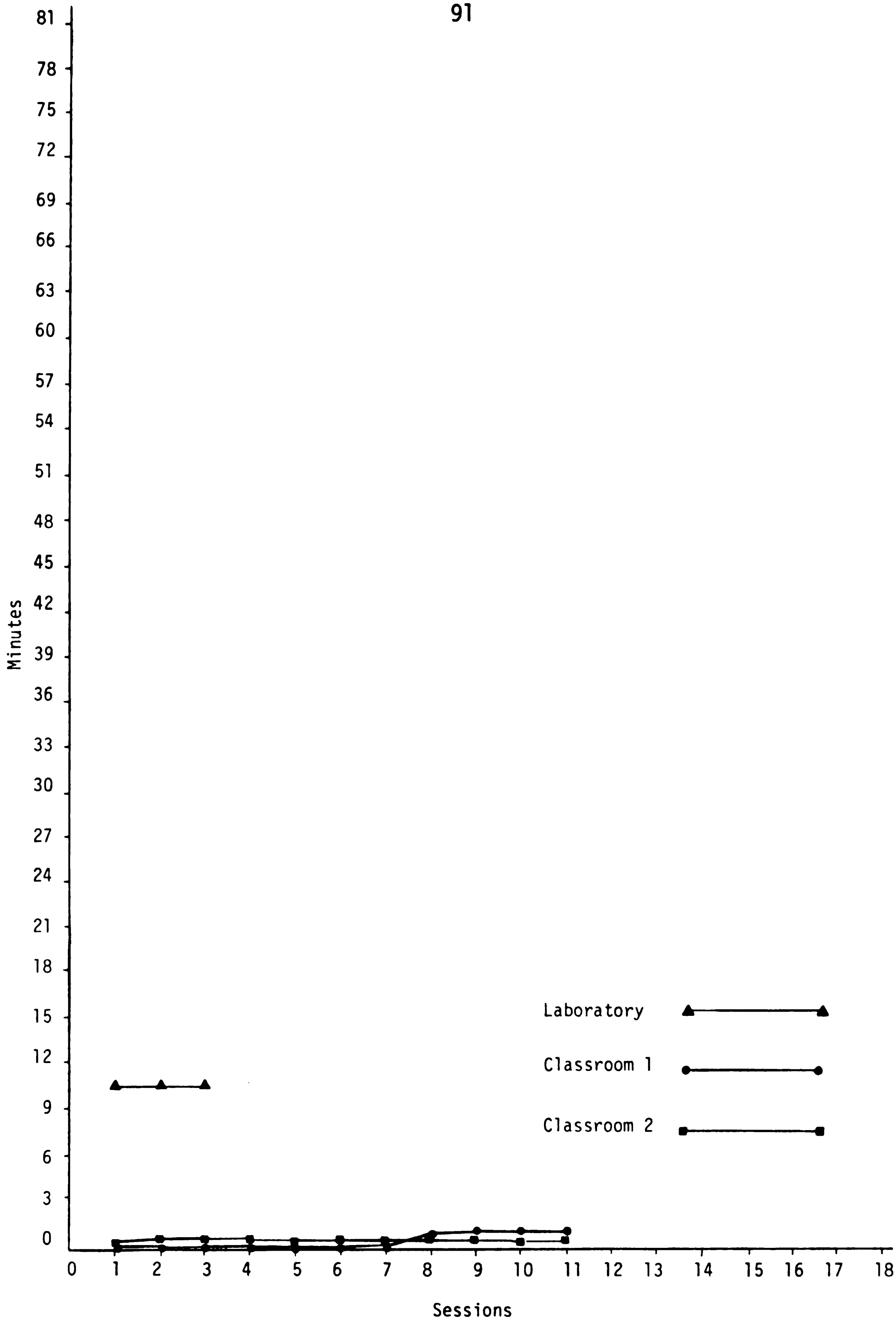

Figure 8.--Head Rolling: Cumulative Time in Seconds for Case 4.

the frequency and the time, again, point out the situation where the subject would begin to emit the blindism and suddenly stop. As was explained in Case 2, this abrupt stopping of the head rolling behavior was in contrast to the usual performance when the subject would initiate the blindism, emit the behavior over a period of time and gradually decrease the blindism until it was stopped. The higher frequency but shorter time duration seemed to be an indication that the blindism was in the process of being eliminated. Therefore, the results offer moderate support for the Laboratory Generalization hypothesis and are in agreement with the findings of Cases 1 and 3.

The Classroom Generalization hypothesis was tested by the evaluation of the percentage scores (see Table 22) of T2 in Classroom 2. The frequency score was 8.3% and the time score was 3.3%. As discussed previously, the increase in frequency and decrease in time obtained in Phase T1 of Classroom 2, indicates the blindism was in the process of being eliminated. This, in fact, could influence the results in T2 of Classroom 2 to some degree. However, it was pointed out that the blindism was not emitted during the Baseline, T1 or T2 of Classroom 1. Yet, when the treatment was shifted to Classroom 1 (i.e., Phase T2) the experimenter served as S^D. That is, the subject was aware of the experimenter's presence and knew that at that particular time she could receive punishment. Therefore, due to prior conditioning, the awareness of the experimenter's presence which was a stimulus indicating the presence of punishment, served as a form of the treatment and thus, the generalization of effects to Classroom 2 (the subject was not aware of the experimenter's presence in Classroom 2). Therefore, the results agree with those obtained in Cases 2 and 3 and moderately support the Classroom Generalization hypothesis.

The Concomitant hypothesis was tested by the evaluation of scores represented (see Table 23) in T1 of the Laboratory Session and in Phase T2 of Classroom 1. Since the secondary blindism of eye-poking was not emitted during the Baseline or T1 of the Laboratory Session, no data was available for testing the hypothesis from this session. However, as discussed in Case 1, the lack of occurrence of the secondary blindism offers evidence in opposition to the symptom substitution concept. As cited previously, the primary blindism was not emitted during the Baseline, T1 or T2 of Classroom 1. However, the secondary blindism was emitted during these times in Classroom 1. The percentage scores in T2 of Classroom 1 were 50% for frequency and 25% for time. The results from Classroom 1 are in agreement with Cases 1 and 2 and support the Concomitant hypothesis.

In summary, the results of Case 4 were in agreement with Cases 1, 2, and 3 in supporting the Treatment hypothesis. The results in terms of time supported the Laboratory Generalization hypothesis and were in agreement with Cases 1 and 3. However, the frequency score for Classroom 2 increased (i.e. 116%). The Classroom Generalization hypothesis was moderately supported and in agreement with Cases 2 and 3. Finally, the results of Case 4 relating to the Concomitant hypothesis are in agreement with Cases 1 and 2 (i.e., supporting the hypothesis). The data in Case 4 also agreed with Cases 1 and 2 in refuting the response or symptom substitution concept.

TABLE 23.--Case 4: Means and Percentage Scores for the Secondary Blindism by Stimulus Situation and Experimental Phase.

Stimulus Situation	Baseline		T1		T2		Ob		T2'	
	M[1]	%[2]	M	%	M	%	M	%	M	%
Experimental Session										
f	0		0	(0)						
t	0		0	(0)						
Classroom 1										
f	2		.5	(25)	1	(50)	1.57	(78.5)		
t	4		.5	(12.5)	1	(25)	1.28	(32)		
Classroom 2										
f	0		0	(0)	0	(0)	0	(0)		
t	0		0	(0)	0	(0)	0	(0)		

[1]Mean scores expressed in frequency (f) and time (t) in seconds.

[2]Percentage scores are obtained by dividing the mean score for a phone by the baseline mean for the corresponding stimulus situation.

Case 5

Case 5 was a 20-year-old male listed in the ungraded program. Due to the inability to accurately differentiate a head-nodding or bobbing behavior from rocking, either one or both of these behaviors together were scored as representing the primary blindism of rocking. He was involved in the following experimental situations: laboratory session during the first half of the first period (8:30-8:50) in which the subject was using a braille writer while music was playing softly in the background; classroom 1 was an English class during the second period (9:20-10:10); and classroom 2 was a typing class during the third period (10:20-11:10). The experimental schedule represents intrasubject (Phase T2 and Phase T2') direct replication, systematic replication (Phase T1 and Phase T2), multiple baseline technique and the A-B-A-B reversal technique (Baseline - Phase T2 - Phase Ob - Phase T2' in classroom 2).

Results and Discussion

Case 5 tested the following hypothesis: Treatment; Laboratory Generalization; Classroom Generalization; and the Concomitant hypothesis. The unique features of this Case included the use of the reversal technique and the administering of punishment in Classroom 2. During Classroom 2 the subject was observed from outside the classroom and the aversive stimulus was administered via a headset controlled by a Dictaphone Classmaster Transmitter.

The Treatment hypothesis was tested by the scores in T1 of the Laboratory Session and in Phase T2 and T2' of Classroom 2. The frequency and time scores in T1 were 39% and 1.35% respectively.

TABLE 24.--Frequency and Time Scores for the Primary Blindism Obtained in each of the Experimental Phases for each of the Stimulus Situations for Case 5.

Stimulus Situation	Baseline		T1					T2				Ob		T2'		
<u>Laboratory Session</u>																
Schedule	B	B	T	T	T	T	T									
Results f	51	32	70	5	4	2	0									
Results t	12:22	16:35	50	4	3	2	0									
<u>Classroom 1</u>																
Schedule	B	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Results f	36	51	22	18	8	12	4	47	25	46	42	17	4	4	31	40
Results t	3:32	8:10	2:31	1:31	1:13	7:18	10	7:35	2:22	6:06	4:40	1:21	15	21	2:08	6:48
<u>Classroom 2</u>																
Schedule	B	B	0	0	0	0	0	T	T	T	T	0	0	T	T	T
Results f	25	19	14	35	30	52	16	5	4	1	1	43	32	2	3	0
Results t	1:57	14:21	17:23	9:47	8:12	2:13	10:44	7	4	2	1	1:47	58	3	3	0

TABLE 25.--Frequency and Time Scores for the Secondary Blindism Obtained in each of the Experimental Phases for each of the Stimulus Situations for Case 5.

Stimulus Situation	Baseline		T1					T2				Ob		T2'		
Laboratory Session																
Schedule	B	B	0	0	0	0	0									
Results f	1	2	1	0	0	0	1									
Results t	10	2	10	0	0	0	4									
Classroom 1																
Schedule	B	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Results f	12	1	8	5	11	2	5	3	10	8	5	6	10	11	14	7
Results t	4:10	7	3:42	2:20	5:12	36	1:37	33	5:16	2:13	1:37	2:55	4:50	3:12	4:16	2:27
Classroom 2																
Schedule	B	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Results f	14	8	7	6	1	8	11	2	3	4	0	7	6	5	3	1
Results t	6:15	4:30	2:72	2:02	11	30	2:09	8	44	1:02	0	2:69	2:00	1:28	1:18	6

TABLE 26.--Case 5: Means and Percentage Scores for the Primary Blindism by Stimulus Situation and Experimental Phase.

Stimulus Situation	Baseline		T1		T2		Ob		T2'	
	M[1]	%[2]	M	%	M	%	M	%	M	%
Experimental Session										
f	4.5		16.2	(39)						
t	868.5		11.8	(1.35)						
Classroom 1										
f	43.5		12.8	(29.42)	40	(91.95)	10.5	(24.13)	25	(57.47)
t	351		154.2	(43.93)	310.75	(88.53)	48	(13.67)	185.66	(52.89)
Classroom 2										
f	22		29.4	(133.63)	2.75	(12.5)	37.5	(170.45)	1.66	(7.54)
t	489		579.8	(118.56)	3.5	(.71)	82.5	(16.87)	2	(.40)

[1]Mean scores expressed in frequency (f) and time (t) in seconds.

[2]Percentage scores are obtained by dividing the mean score for a phase by the baseline mean for the corresponding stimulus situation.

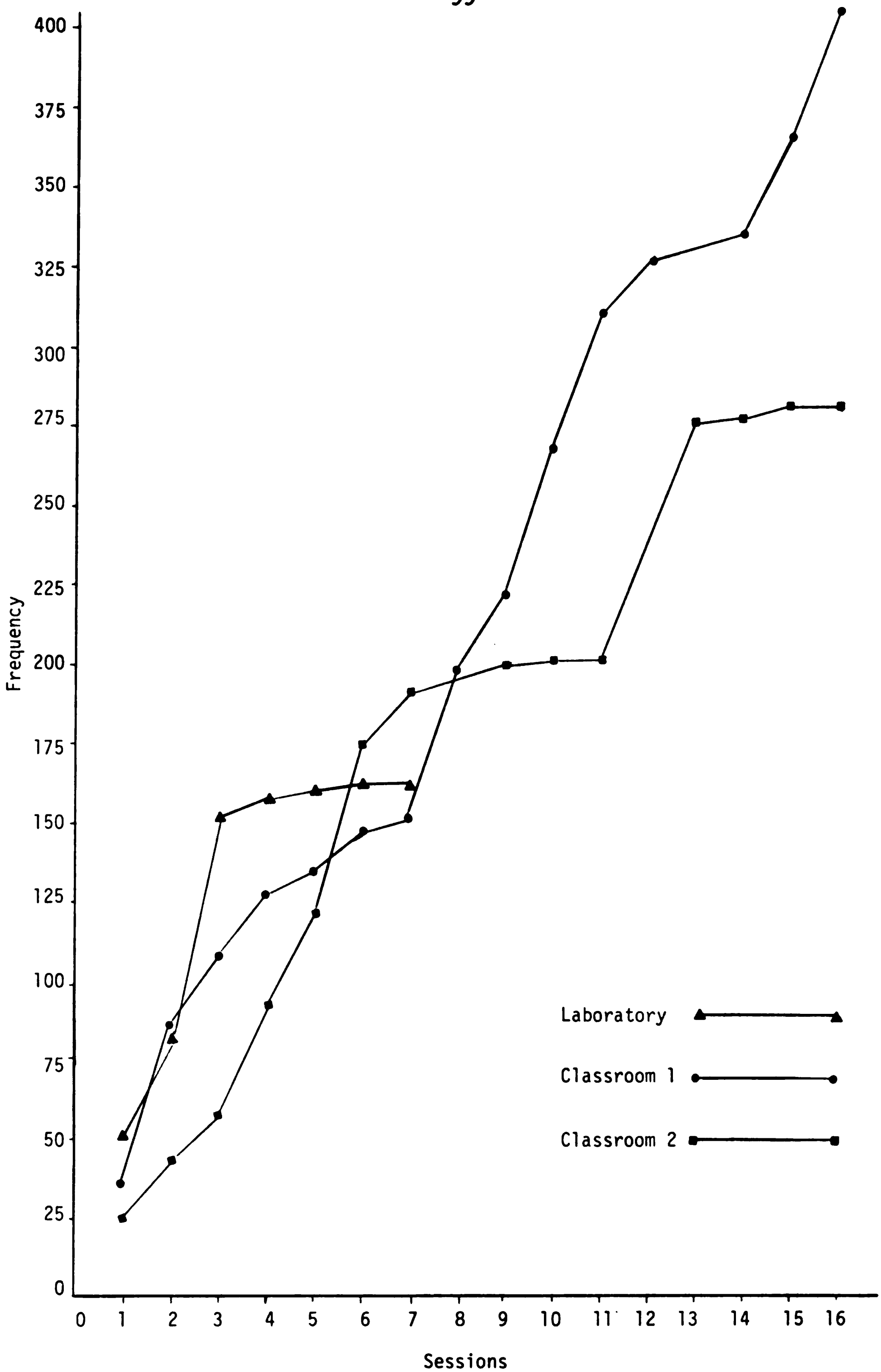

Figure 9.--Rocking-Head Nodding: Cumulative Frequencies for Case 5.

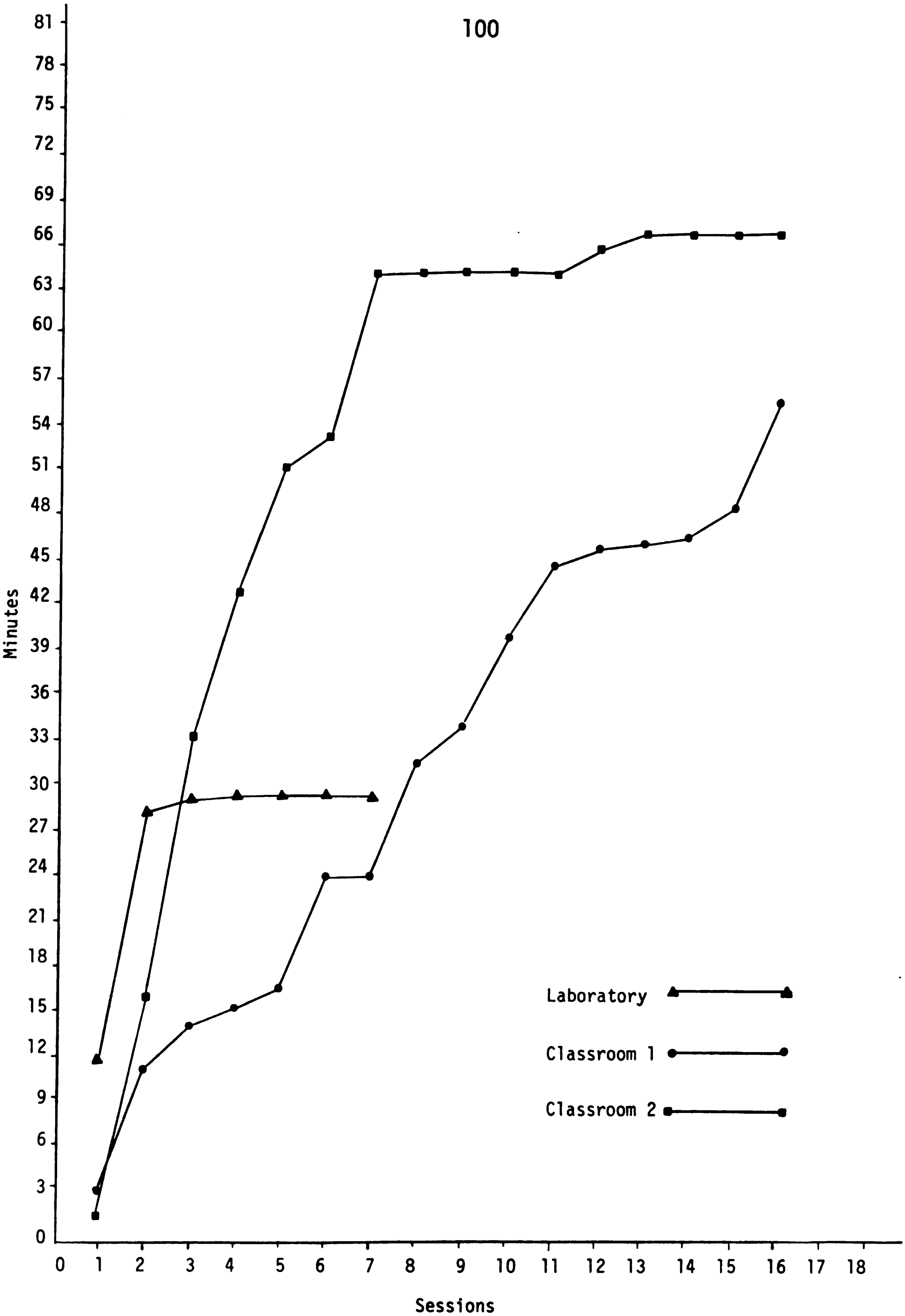

Figure 10.--Rocking-Head Nodding: Cumulative Time in Seconds for Case 5.

During T1 (see Table 26) there was a very extreme decrease between the time scores during the Baseline and the first day of treatment. There was also an abrupt decrease in both time and frequency between the first and second days of treatment. These results vividly demonstrate that even though the blindism was a strong habit, the punishment used was indeed an aversive or noxious stimulus. The subject demonstrated a gradual decrease in the emittence of the blindism after the first day of treatment until the fifth and last day of treatment in T1 when the subject did not emit the blindism. The frequency scores for Phase T2 and T2' of Classroom 2 were 12.5% and 7.54% respectively, while the scores for time in the same Phases were 0.75% and 0.40% respectively. This subject did not receive the positive reinforcement (based on the formula stated in Chapter III) on days 2 and 4 of T2 and day 2 in T2' since he emitted a greater number of blindisms than the frequency criteria set at the beginning of each of the sessions. The discrepancy between Ob and Phases T2 and T2' (i.e., the A-B-A-B reversal technique) offers additional support for the effectiveness of the treatment. Therefore, the results of Case 5 are in agreement with Cases 1-4 in supporting the Treatment hypothesis.

The Laboratory Generalization hypothesis was tested by the inspection of the percentage scores of T1 of Classrooms 1 and 2. The frequency and time scores in Classroom 1 were 29.42% and 43.93%, respectively. These results indicate a generalization of effects derived from the Laboratory Session to Classroom 1. However, the score in Classroom 2 for frequency was 133.63% and 118.56% for time. In spite of the fact that the Laboratory Session and Classroom 2 were similar situations (i.e., using a braille writer and a typewriter, respectively) there were no generalization of effects. The lack of generalization to Classroom 2 may be attributed to the habit strength of the blindism and the amount of treatment administered. There were five treatment sessions during T1 administered to reduce the incidence of a blindism which was reported to have been prevalent in the subject since he entered school. Therefore, in the initial stages of eliminating a behavior, the generalization of the effects may diminish as the time from the administration of treatment increases. The results of Case 5 moderately support the Laboratory Generalization hypothesis in part (i.e., Classroom 1 but not Classroom 2).

The Classroom Generalization hypothesis was tested by the evaluation of the percentage scores of Phase T2 and T2' in Classroom 1. The respective frequency scores for these Phases were 91.95% and 57.47% while the scores for time were 88.53% and 52.89% respectively. These scores were, in fact, higher than the scores obtained in T1 for the same Classroom. This may be attributed to the fact that in T1, Classroom 1 immediately followed the Laboratory (i.e., Treatment Session). In Phase T2 and Phase T2' Classroom 1 preceded Classroom 2 (i.e., Treatment). In spite of these differences between T1 and Phases T2 and T2', the scores are in agreement with those of Cases 2, 3, and 4 and, therefore, moderately supports the Classroom Generalization hypothesis.

The Concomitant hypothesis was tested by the evaluation of scores represented (see Table 27) in T1 of the Laboratory Session and in Phases T2 and T2' of Classroom 2. The scores in T1 were 26.66% for

TABLE 27.--Case 5: Means and Percentage Scores for the Secondary Blindism by Stimulus Situation and Experimental Phase.

Stimulus Situation	Baseline		T1		T2		Ob		T2'	
	M[1]	%[2]	M	%	M	%	M	%	M	%
Experimental Session										
f	1.5		.4	(26.66)						
t	6		2.8	(46.66)						
Classroom 1										
f	6.5		6.2	(95.38)	6.5	(100)	8	(123.07)	10.66	(164)
t	128.5		161.4	(125.60)	144.75	(112.64)	231.5	(180.15)	298.33	(232.16)
Classroom 2										
f	13.5		6.6	(48.88)	2.25	(16.66)	6.5	(48.14)	3	(22.22)
t	322.5		84.8	(26.29)	28.5	(8.83)	122	(37.82)	57.33	(17.77)

[1]Mean scores expressed in frequency (f) and time (t) in seconds.

[2]Percentage scores are obtained by dividing the mean score for a phase by the baseline mean for the corresponding stimulus situation.

frequency and 46.66% for time. The respective frequency scores for T2 and T2' in Classroom 2 were 16.66% and 22.22% while the corresponding scores for time were 8.83% and 17.77%. The results are in agreement with those of Cases 1, 2, and 4 and support the Concomitant hypothesis. In addition, the results also agreed with those Cases in refuting the response or symptom substitution concept. In Classroom 1 where treatment was not administered, there was a steady increase in time and frequency of the secondary blindism while the primary blindism was emitted below the baseline through all four phases of Classroom 1. This may indicate that in stimulus situations where treatment was not administered there would only be a generalization of Treatment effects on the primary, treated blindism.

In summary, the results of Case 5 were in agreement with Cases 1, 2, 3, and 4 in supporting the Treatment hypothesis. The results of Case 5 moderately support the Laboratory Generalization hypothesis in part (i.e., Classroom 1 and Classroom 2). The Classroom Generalization hypothesis was moderately supported and in agreement with Cases 2, 3, and 4. Finally, Case 5 offers additional support for the principle that the reduction of a blindism in one setting contributes to a simultaneous reduction of the second untreated blindism in that setting. In addition, the results also agree with those Cases (i.e., Cases 1, 2, and 4) in refuting the response or symptom substitution concept.

Case 6

Case 6 was a 17-year-old eleventh grade female whose primary blindism was rocking. She was involved in the following experimental situations: laboratory session before school in which the subject was listening to prerecorded stories; classroom 1 which was an English class during the third period (10:20-11:10); and classroom 2 which was a biology class during the fourth period (11:10-12:00). The experimental schedule represents intrasubject ($T2_{(1)}$ and Phase $T2_{(2)}$ day 9), direct replication, systematic replication (T1, $T2_{(1)}$ and T2'), multiple baseline technique and the A-B-A-B reversal technique (Baseline - Phase T2 - Ob, Phase T2' in classroom 1).

Results and Discussion

Case 6 tested the following hypotheses: Treatment; Laboratory Generalization; Classroom Generalization; Concomitant; and the CS-US hypothesis. The unique features of this case include the pairing of an unconditioned stimulus (US) or the aversive stimulus with the neutral or conditioned stimulus (clicker) during T1 and then in $T2_{(1)}$ and $T2_{(2)}$ only using the CS. Also, the treatment (i.e., punishment and positive reinforcement) was administered intermittently during Phase T2' (i.e., sometime during a continuous 100-minute period). Finally, the use of the A-B-A-B reversal technique was used in only two of the other cases.

The Treatment hypothesis was tested by the scores represented (see Table 30) in Phase T1 of the Laboratory Session, $T2_{(1)}$ of Classroom 1, $T2_{(2)}$ of Classroom 2 and T2' of Classrooms 1 and 2. The scores for T1 were zero for frequency and time. This immediate "one-trial learning" was discussed in Case 1 and also occurred in Cases 2 and 4.

During $T2_{(1)}$ only the CS was used as the conditioned adversive stimulus. During this Phase, the frequency score was 5.68% and the time

TABLE 28.--Frequency and Time Scores for the Primary Blindism Obtained in each of the Experimental Phases for Each of the Stimulus Situations for Case 6.

Stimulus Situation	Baseline		T1	$T2_{(1)}$				Ob $T2_{(2)}$			T2'			
Laboratory Session														
Schedule	B	B	T											
Results f	15	5	0											
Results t	1:09	23	0											
Classroom 1														
Schedule	B	B	0	T	T	T	T	0	0	0	T	T	T	T
Results f	22	22	30	3	2	0	0	47	9	1	0	5	3	3
Results t	4:32	3:31	5:20	3	2	0	0	10:52	34	56	0	10	6	5
Classroom 2														
Schedule	B	B	0	0	0	0	0	0	T	0	T	T	T	T
Results f	14	15	9	15	19	29	13	25	1	19	0	0	0	0
Results t	8:19	3:45	2:58	1:29	11:11	4:21	1:08	14:34	1	7:56	0	0	0	0

TABLE 29.--Frequency and Time Scores for the Secondary Blindism Obtained in each of the Experimental Phases for each of the Stimulus Situations for Case 6.

Stimulus Situation	Baseline		T1	T2(1)				Ob T2(2)			T2'			
Laboratory Session														
Schedule	B	B	0											
Results f	3	5	2											
Results t	6	11	9											
Classroom 1														
Schedule	B	B	0	0	0	0	0	0	0	0	0	0	0	0
Results f	13	13	12	5	0	0	10	12	5	6	2	7	10	4
Results 5	3:45	4:39	4:11	5	0	0	40	1:35	52	2:20	2	42	45	9
Classroom 2														
Schedule	B	B	0	0	0	0	0	0	0	0	0	0	0	0
Results f	9	3	7	4	7	11	19	9	1	10	0	1	1	0
Results t	2:17	3:12	2:01	1:56	2:46	2:52	3:19	2:18	3	2:47	0	4	3	0

TABLE 30.--Case 6: Means and Percentage Scores for the Primary Blindism by Stimulus Situation and Experimental Phase.

Stimulus Situation	Base-line	T1		$T2_{(1)}$		$T2_{(2)}$		Ob		T2'	
	M[1]	M	%[2]	M	%	M	%	M	%	M	%
Experimental Session											
f	10	0	0								
t	46	0	0								
Classroom 1											
f	22	30	(136.36)	1.25	(5.68)	9	(40.9)	24	(109.09)	2.75	(12.5)
t	241.5	320	(132.50)	1.25	(.51)	34	(14.07)	344	(142.44)	5.25	(2.17)
Classroom 2											
f	14.5	9	(60.06)	19	(131.03)	1	(6.89)	22	(151.72)	0	(0)
t	362	178	(49.17)	272.25	(75.2)	1	(.27)	675	(186.46)	0	(0)

[1] Mean scores expressed in frequency (f) and time (t) in seconds.

[2] Percentage scores are obtained by dividing the mean scores for a phase by the baseline mean for the corresponding stimulus situation.

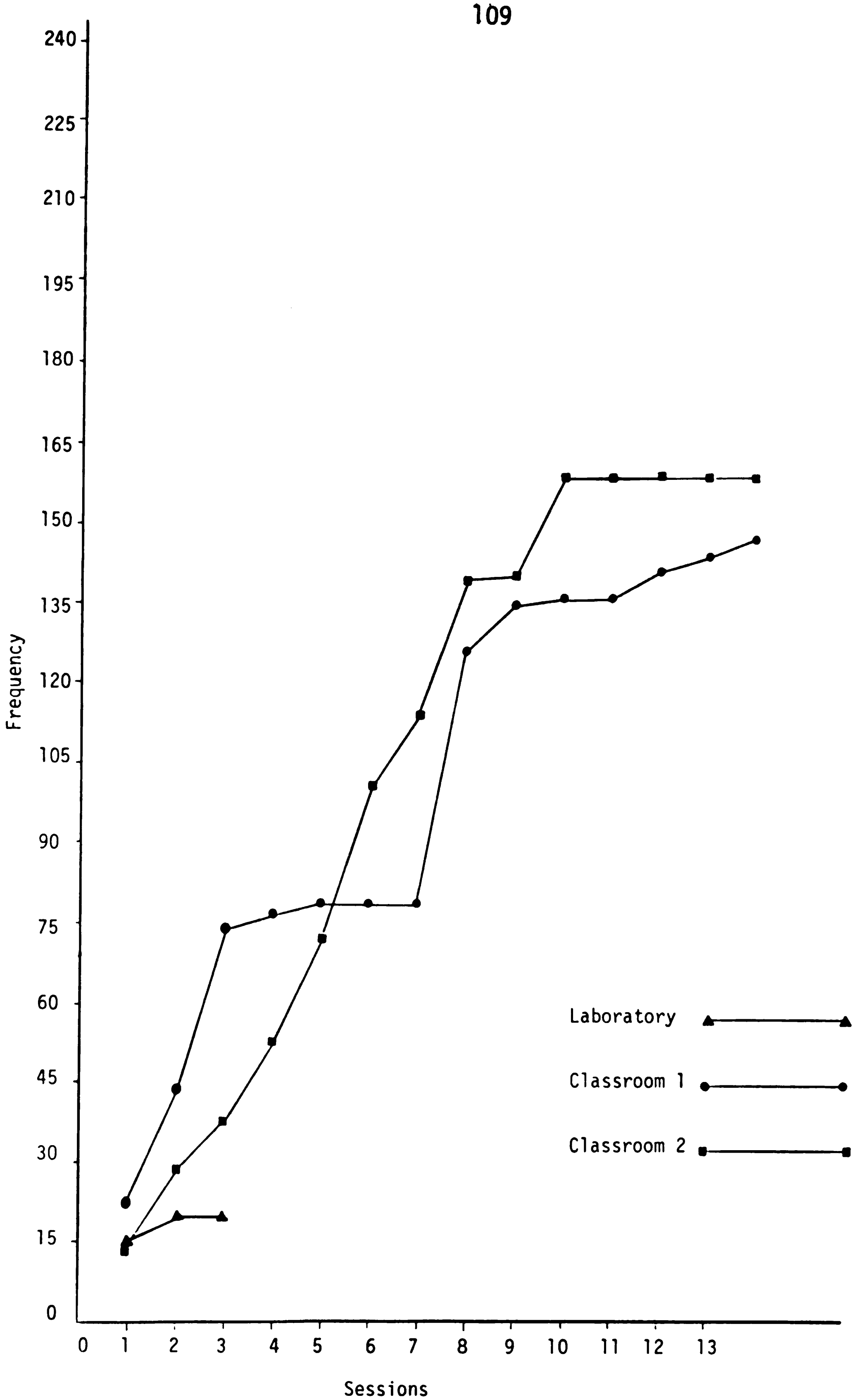

Figure 11.--Rocking: Cumulative Frequencies for Case 6.

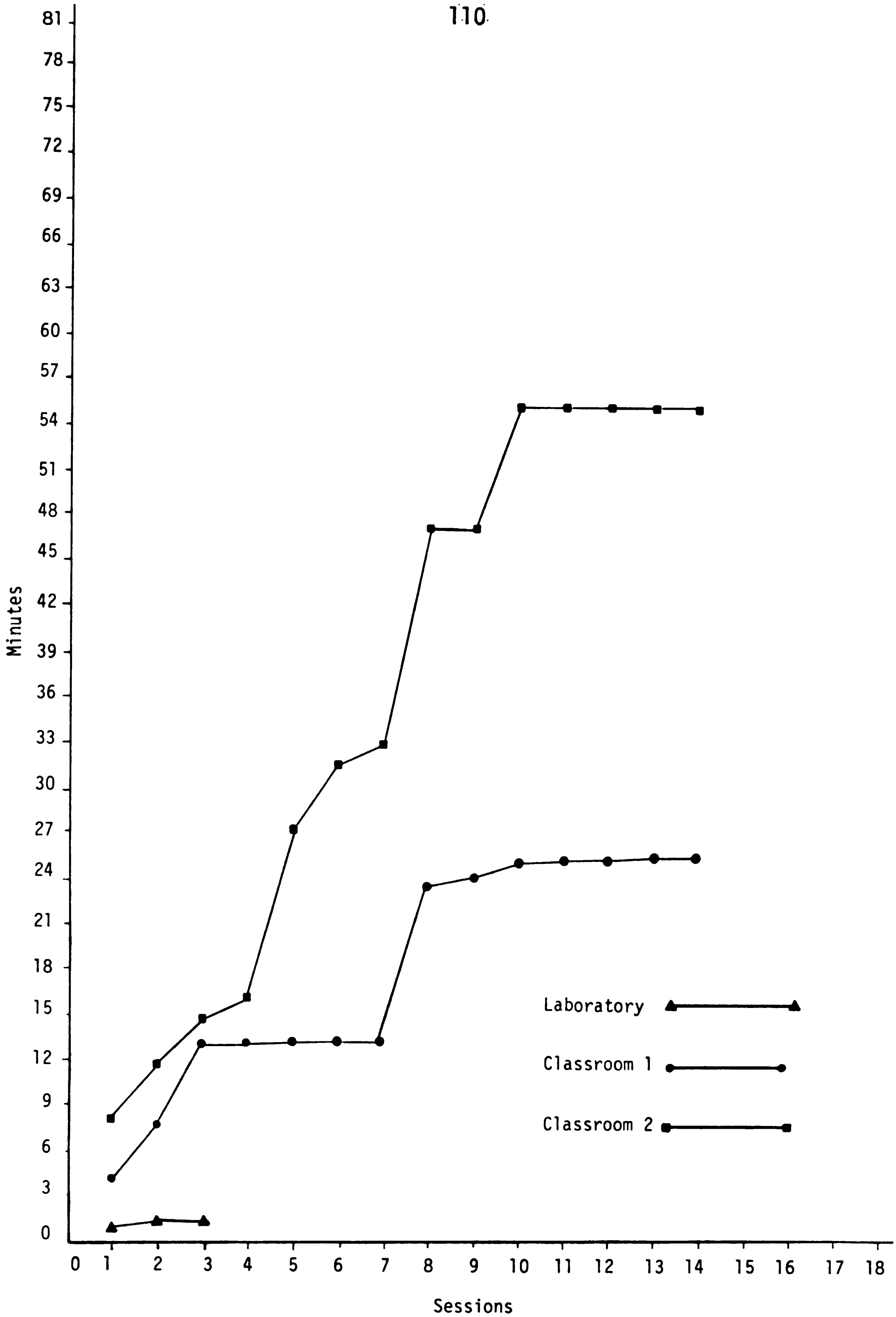

Figure 12.--Rocking: Cumulative Time in Seconds for Case 6.

was 0.51%. In Phase $T2_{(2)}$ only the CS was used in a Classroom where treatment had not yet been introduced. The frequency score was 16.89% and the score for time was .27%. In T2' (see Table 28) the subject was instructed that during her two consecutive classes (Classroom 1 and 2) she would be observed for 20 minutes. However, she would not know which 20 minutes out of the possible 100 minutes (intermittent reinforcement). The CS was not used during this Phase. If the subject did not rock, she received $1.00. The subject was observed for a total of 100 minutes. However, data was only recorded for 20 minutes out of each class or a total of 40 minutes. The frequency scores for Classroom 1 and 2 in Phase T2' were 12.5% and zero, respectively, while the corresponding scores for time were 2.17% and zero. All of these scores were in support of the Treatment hypothesis and agreed with all of the previous Cases.

The Laboratory Generalization hypothesis was tested by the inspection of the percentage scores of T1 in Classrooms 1 and 2. The frequency and time scores in Classroom 1 were 136.36% and 132.50% respectively. The scores in Classroom 2 for frequency and time were 62.06% and 49.17% respectively. These scores were based on a "one-trial learning" during one treatment session. The scores in Classroom 1 do not support the hypothesis while the scores from Classroom 2 do, in fact, offer moderate support for the hypothesis. One explanation for the discrepancies between the results in the two classrooms may, in fact, be a "spontaneous recovery." The punishment was administered early in the day and the behavior was suppressed. However, when the possibility of punishment was removed (i.e., the S^D or experimenter) the incidence of the behavior went over the baseline (i.e., Classroom 1) and later again dropped below the baseline. This may be attributed to the fact as mentioned earlier, that only one treatment session had been administered.

The Classroom Generalization hypothesis was tested by the evaluation of the percentage scores of $T2_{(1)}$ in Classroom 2. The frequency score for this classroom was 131.03% and 75.2% for time. The frequency score was over 100%. However, there was partial support for this hypothesis since the time score was 75.2%. The scores for the same Classroom in the previous Phase (T1) were 62.06% for frequency and 49.17% for time. Therefore, there was an increase in scores in $T2_{(1)}$ over T1 in the same classroom. An explanation for the increase would be "spontaneous recovery" as discussed previously. Therefore, in Classroom 1 punishment was introduced and greatly reduced the behavior. In the class immediately following, the treatment was discontinued, thereby allowing for the spontaneous recovery. While the frequency was above the baseline (i.e., 131.03%) the time only increased to 75.2% of the baseline. The discrepancy between frequency and time has been discussed previously in other Cases.

The Concomitant hypothesis was tested by the evaluation of the following scores (see Table 31): T1 of the Laboratory Session (62.5% - frequency and 70.58% time); $T2_{(1)}$ of Classroom 1 (28.84% - frequency and 4.46% - time); $T2_{(2)}$ of Classroom 2 (16.66% - frequency and 1.82% - time); T2' of Classroom 1 (44.23% - frequency and 9.72% - time) and Classroom 2 (8.33% - frequency and 1.06% - time). These scores were

TABLE 31.--Case 6: Mean and Percentage Scores for the Secondary Blindism by Stimulus Situation and Experimental Phase.

Stimulus Situation	Base-line	T1		$T2_{(1)}$		$T2_{(2)}$		Ob		T2'	
	M[1]	M	%[2]	M	%	M	%	M	%	M	%
Experimental Session											
f	4	2.5	(62.5)								
t	8.5	6	(70.58)								
Classroom 1											
f	13	12	(92.3)	3.75	(28.84)	5	(38.46)	9	(69.63)	5.75	44.23
t	252	251	(99.6)	11.25	(4.46)	52	(20.63)	117.5	(46.62)	24.5	9.72
Classroom 2											
f	6	7	(116.66)	10.25	(170.83)	1	(16.66)	6.5	(158.33)	.5	8.33
t	164.5	121	(73.55)	162	(98.48)	3	(1.82)	152.5	(92.7)	1.75	1.06

[1]Mean scores expressed in frequency (f) and time (t) in seconds.

[2]Percentage scores are obtained by dividing the mean scores for a phase by the baseline mean for the corresponding stimulus situation.

all in agreement with Cases 1, 2, 4, and 5 and support the Concomitant hypothesis.

The CS-US hypothesis was tested by the inspection of the scores represented (see Table 30) in $T2_{(1)}$ of Classroom 1 (5.68% - frequency and 0.51% - time) and $T2_{(2)}$ of Classroom 2 (6.89% - frequency and 0.27% - time). These scores support the CS-US hypothesis. It should be noted (see Table 28) that in the last two treatment sessions of $T2_{(1)}$, the blindism was not emitted. During $T2_{(2)}$ (treatment had not been administered during this class nor was it anticipated) the blindism was only admitted once.

In summary, Case 6 was in agreement with Cases 1-5 supporting the Treatment hypothesis. In addition, this Case also employed a conditioned aversive stimulus and an intermittent schedule of reinforcement. The Laboratory Generalization hypothesis was moderately supported in part (i.e., the results from Classroom 1 did not support the hypothesis while the data from Classroom 2 was in agreement with other Cases in moderately supporting the hypothesis). Case 6 moderately supported the Classroom Generalization in part (i.e., time but not frequency). This discrepancy between frequency and time was discussed elsewhere in the Chapter. The Concomitant hypothesis was supported and in agreement with Cases 1, 2, 4, and 5. Finally, the CS-US hypothesis was supported and, in fact, in the last half of Phase $T2_{(1)}$, the blindism was not emitted at all.

Discussion

The experimental design of this study was utilized to demonstrate a change in behavior (i.e., a direct cause and effect relationship) and, therefore, show that a particular stimulus caused a particular effect. Significance in relation to a cause and effect change in behavior is relative to the behavior in question. A decrease of 15 percent in a rocking behavior might be highly significant in terms of preventing damage to the femur and acetabulum; however, the same decrease in behavior may not be significant in relation to the effects on the social stigma attached to maladaptive behavior.

In this study, a decrease in behavior to 51-99% of the original baseline was considered a moderate decrease and a decrease to 0-50% of the original (baseline) behavior was considered a marked decrease.

All six cases tested the Treatment hypothesis. In every case, when treatment was introduced there was a marked decrease in the frequency and the duration of the blindism. In Cases 1, 2, 4, and 6 after the punishment contingency was explained and the punishment was administered once, the blindisms were not emitted for the rest of the treatment session. These immediate effects offer support for the effectiveness of the aversive stimulus. When the treatment was discontinued (i.e., Phase Ob), the frequency and time increased. In three of the Cases, the treatment was reintroduced (i.e., Phase T2') and the blindism was again reduced. The results of all six experiments demonstrate a marked decrease in the behavior and, therefore, support the hypothesis.

The Laboratory Generalization hypothesis was tested by experiments 1, 3, 4, 5, and 6. In experiments 1 and 3, when treatment was introduced in the Laboratory Session, there was an accompanying decrease in frequency and time of the blindism in the two classroom situations.

In Case 4, there were no data to test the hypothesis from Classroom 1; however, in Classroom 2 there was a moderate increase in frequency and a marked decrease in time. In Cases 5 and 6 there was a decrease in the percentage scores (marked decrease for Case 5 and a moderate decrease for Case 6) in one classroom and a moderate increase in the percentage scores of the other classroom. The data from the five cases testing the Laboratory Generalization hypothesis represents a great deal of variability between cases and even within the same experiment. Therefore, there was a trend in the data offering only moderate support for this hypothesis.

The hypothesis dealing with the generalization of effects from one classroom to another was tested by experiments 2, 3, 4, 5, and 6. In Case 2, when the treatment was first introduced in Classroom 1, there was a marked decrease in time but not in frequency in Classrooms 2 and 3. However, when the treatment was introduced (Phases T2 and T2') in classroom 2, there were accompanying decreases in the frequency and time of the blindism in Classroom 3. In Case 6, there was a moderate decrease in the time and a moderate increase in the frequency of the blindism. In Cases 3, 4, and 5, when the treatment was introduced in one classroom, there were accompanying decreases of the blindism in a second classroom situation. The data from the five cases testing this hypothesis were very similar to those of the Laboratory Generalization hypothesis. There was a trend in the data offering only moderate support for this hypothesis. In view of the great variability between cases and even within the same experiment, the findings relative to the Laboratory and Classroom Generalization hypotheses are equivocal.

Similar findings were discussed by Johnston (1972) concerning the use of punishment in natural settings. He maintains that if punishment procedures are less successful than expected, the uncontrolled factors in the natural setting may have hindered the effects of the punishing stimuli. In addition, punishment and positive reinforcement administered in one classroom will serve as a discriminative stimulus (S^D) for that classroom. The effects on a behavior will remain place or person specific. As long as the subject is in a specific room and/or a specific teacher (or researcher) is present the punished behavior will not be emitted or only at a reduced rate. Such was the case reported by Ramey (1974). Lovaas (1969) maintains that if punishment is to be maximally therapeutic it must be administered by more than one person and in more than one setting.

All six Cases tested the Concomitant hypothesis. In Case 1, the secondary blindism was emitted sporadically and did not occur during the Baseline, nor during some of the other phases. Therefore, there were no data from this case to test the hypothesis. In Cases 2, 4, 5, and 6, when treatment was contingent upon the primary blindism, there was a simultaneous marked decrease in this blindism as well as in the secondary blindism (in Case 6, Phase T1, Laboratory, there was a moderate decrease). The primary blindism for the subject in Case 3 was a very violent rocking. The secondary blindism of eye poking was an incompatible behavior with the rocking since this subject would swing both arms in a flexion-hyperextension motion that was syncronized with the extension-flexion motion of the trunk. The subject would put his fingers or some part of the hand in his eyes; and when he would put his hands down to his sides, he would begin rocking. Therefore, the subject exhibited a marked decrease in the primary treated blindism and a simultaneous increase in the untreated secondary blindism (moderate increase in frequency and a marked increase in time). Thus, the results for this subject ran counter to the trend for the other cases. The principle that the reduction of one blindism contributes to a simultaneous reduction in a second untreated blindism was established and supported by four of the six Cases. However, five of the Cases offered evidence in opposition to the response, or symptom, substitution concept since when the most prevalent blindism was eliminated, the second most prevalent blindism did not increase nor did any new blindism appear during the stimulus situations.

Case 6 tested the hypothesis that a neutral stimulus (CS) paired with an aversive stimulus (US) during the initial treatment sessions serves as an effective aversive stimulus in repeated treatment sessions. This hypothesis was supported by the marked decreases in frequency and time.

The Duration hypothesis was tested by Case 1. After treatment was discontinued in the Laboratory Session (day 4), there was a spontaneous recovery of the blindism (day 5) which lasted only the one day. From that point on, the blindism was emitted at a markedly decreased frequency and time as evidenced by the almost horizontal slope in Figures 1 and 2.

The discussion of these findings would not be complete without mentioning the problems of implementation in natural settings. Reppucci and Saunders (1974) discussed problems that confront the behavior modifier in natural settings and tend to interfere with the attainment of optimal results. These same problems were incurred in this study. The problem of institutional constraint or red tape was evident in the requirement that the experimenter obtain permission to do the study from the following individuals: superintendent, administrative assistant, school psychologist, principal of the upper school, principal of the lower school, the head housekeeper, and the head cook. Once permission was given by all of these individuals the students were selected. At this point permission had to be obtained from the students, parents of the students and all of the teachers involved. After permission had been received from all of these individuals, scheduling had to be worked with and agreed to by all of the above individuals with the exception of the superintendent and the parents.

Fortunately, the problem of external pressure was not a major one in that the professional staff were very supportive of the concept of eliminating blindisms. However one problem of external pressure that did arise overlapped the problems of common vocabulary, compromise, and labeling as discussed by Reppucci and Saunders. This problem arose when the use of punishment was mentioned. It was only after the unique aversive stimulus of the chalk screeching noise was proposed that the administration would allow punishment to be used.

One problem of working with the indigenous staff (two-populations) arose in the selection of students and scheduling with teachers. One teacher explained the entire study to two potential subjects prior to the beginning of study. These potential subjects were eliminated due to the contamination of the baseline data.

It was not felt that the other problems,--those of limited resources, inflexibility and the compromises required in natural settings,--discussed by Reppucci and Saunders had an effect on this study.

Summary of Findings

All six cases tested the Treatment hypothesis, and the results demonstrated a marked decrease in the primary blindism. The treatment hypothesis was supported. The data from five cases were used to test the Laboratory and Classroom Generalization hypotheses. While some of the cases offered moderate support for these hypotheses, there were instances also of contradictory findings, so that these results must be regarded as inconclusive. All six cases tested the Concomitant hypothesis. Four of the six cases supported the hypothesis that the reduction of one blindism contributes to a simultaneous reduction of a second untreated blindism. Five of the cases offered evidence in opposition to the response, or symptom, substitution concept. Therefore, the Concomitant hypothesis was accepted in four cases, rejected in one case, and no data were available in one case.

The CS-US hypothesis was supported. Finally, the results supported the duration hypothesis.

CHAPTER V

SUMMARY, CONCLUSIONS, LIMITATIONS, PROBLEMS, AND IMPLICATIONS

Summary

The purpose of this study was to determine if a combination of punishment and positive reinforcement is effective in the reduction of blindisms, to determine the effects of such treatment on concomitant blindisms, and to observe the generalization of these effects to various stimulus situations. In addition, the literature reviewed indicated a need to test effective procedures for controlling blindisms and to introduce variations in the application of the treatment procedures to generate suggestions for procedures in classroom settings.

Six subjects were used, each representing an independent experimental study. The subjects ranged in age from 16 to 20, with I.Q. scores from 85 to 134. Of the two males and four females, five of the subjects were blind due to retrolental fibroplasia and one student was blind due to optic atrophy. The visual acuity of the subjects varied from no light perception in either eye to light perception in both eyes.

A multiple baseline technique was used with each of the six cases. In three of the cases, an A-B-A-B reversal technique was also applied. The study of six individual cases ficilitated the use of a combination of replication designs (i.e., intrasubject direct replication and systematic replication).

The hypotheses were tested by evaluating changes in the frequency and duration of the blindism. The replication of several cases, independently described, served to give additional data to evaluate the hypotheses.

The blindisms (sterotypic behaviors) observed in this study were head-rolling, rocking and eye-poking. These behaviors were recorded in terms of frequency and time (duration) of the blindism. The punishment or aversive stimulus used was a screeching sound of chalk on a blackboard. The positive reinforcer was money. The experiment took place at the Western Pennsylvania School for the Blind in a combination of three stimulus situations (i.e., laboratory setting and regular classroom situations).

The experiments were divided into the following sections: Baseline or operant level of behavior; Phase T1--the treatment was administered in one stimulus situation; Phase T2--the treatment was discontinued in the first stimulus situation and administered in a second stimulus situation; Phase Ob--all treatment was discontinued and the subject was only observed; and Phase T2'--the treatment was reinstated in the same stimulus situation as in Phase T2.

In every instance for all six cases, where punishment and positive reinforcement were introduced there was a marked decrease in the frequency and the time the blindism was emitted and therefore the hypothesis was supported.

The trend of the data offered moderate support for the generalization of a reduction of a blindism in a laboratory setting to a reduction of the blindism in a classroom setting, however there was a variability of results. This variability of results was also found in the data testing the hypothesis dealing with the generalization of a reduction of a blindism in one classroom setting to another classroom setting. While some of the cases offered moderate support for these hypotheses, there were instances also of contradictory findings, so that these results must be regarded as inconclusive.

The treatment and reduction of one blindism contributed to a simultaneous reduction in a second untreated blindism in four of the six cases. No data were available in one case and there was an increase in the second untreated blindism in the sixth case.

The results of a neutral stimulus (CS) paired with an aversive stimulus (US) during initial treatment sessions demonstrated that the CS served as an effective aversive stimulus in repeated treatment sessions.

Finally, the results demonstrated that the reduction of blindism in a laboratory setting contributed to a markedly reduced frequency and duration of this blindism over a period of time without further treatment.

Conclusions

Conclusions from this study were as follows:

1. The treatment effects obtained from using the aversive stimulus of the screeching noise of chalk on a blackboard as punishment were effective in reducing the incidence of mannerisms in blind children.

The combined use of positive reinforcement also proved to be effective in maintaining the appropriate behavior which was incompatible with the maladaptive behavior. It would appear, however, that the dramatic reduction of the blindisms obtained by the use of punishment and positive reinforcement may have been aided by other variables such as making the subject aware of the mannerism and/or peer group interaction.

2. Based on the results of this study, it is inconclusive as to whether the treatment effects obtained in the laboratory or classroom setting generalized to other classroom settings. These results may have been more definitive had the treatment been administered over a longer period of time.

3. Four of the cases supported the hypothesis that a reduction in one treated blindism leads to a simultaneous reduction in a second untreated blindism. Yates (1970) maintains that the only condition in which symptom substitution would be expected to occur would be when the most frequently occurring response to anxiety had been inhibited; the next highest in the hierarchy would appear. The results from five of the cases would not support the symptom substitution concept, as the second most frequently occurring behavior did not increase in frequency or duration.

4. A neutral stimulus (click sound) paired with the aversive stimulus (chalk screeching noise) did serve as an effective aversive stimulus. The use of a clicker or some other such device would allow the teacher to treat mannerisms in the classroom without disrupting class and without reinforcing the mannerism.

5. The reduction of a blind mannerism was maintained over a period of time without further treatment.

6. The mannerisms of the blind students responded to treatment applied in a natural setting, according to the principles of behavior modification. These stereotypic behaviors should be regarded as mannerisms and not as behaviors unique to blind individuals (i.e., blindisms).

Limitations of the Study

The major limitation on generalization from the findings of this study arises from the fact that in each case several treatments were administered. When change occurred it may have been due to only one of the variables or to several acting together. In addition to the manipulated variables of punishment and positive reinforcement there may have been uncontrolled independent variables. For example, the rapid elimination of blindisms in some cases may have been a function of self-regulation by the subject based on the social pressure represented by the experimenter's directions to the subject. In any event, it is not possible, given the design of the study, to partial out the relative influences of the manipulated independent variables.

A second limitation relates to the hypothesis of symptom substitution. While the findings appear to provide evidence that symptom substitution did not occur vis a vis the secondary blindism chosen for observation by the experimenter it is, of course, possible that other symptomatic behaviors, not under observation, increased in frequency. It is this general problem of submitting the symptom substitution hypothesis to precise experimental control that, no doubt, accounts for the lack of general agreement on this issue.

Finally, it is recognized that blindisms, reduced dramatically over the approximately three week period of the study, might well have appeared again over a longer time period. Therefore, whether the treatment procedures used in this study are effective as practical methods for eliminating blindisms will have to be determined by further investigation.

Problems

One difficulty encountered resulted from the setting of the study. Since all of the students were in a residential setting, there was a great deal of communication about the purpose of the research. This fact made it very important that when instructions were given regarding the mannerisms, it was done on the same day for all students.

A second problem was making sure the stimulus situation in the laboratory setting was similar to other situations where the subject emitted the mannerism. Initially, the subjects were listening to music and few of them exhibited mannerisms. Those that did emit the stereotypic behavior did so at a rate far less than that observed in the initial screening and selection.

Finally, using the multiple baseline technique in a school setting with several students became a monumental scheduling problem. This factor should be seriously considered in any attempted replication of the study.

Implications for Future Research

The results of this study are promising enough to suggest that further exploration of the utility of punishment and positive reinforcement in reducing the occurrence of blindisms is warranted. What is needed, as suggested in the section above, are studies in which treatments are isolated in order to eliminate the confounding of the treatment variables.

Perhaps particularly appropriate to the study of this problem would be designs involving the intensive experimental study of the single case. This would be particularly appropriate if one wished to explore the consequences on other behaviors of the successful elimination of a blindism. But such a design would also permit a wider observation of the transfer of training, and observation of the situational factors that tend to encourage or inhibit the blindism response. Such an intensive study could also be extended to evaluate the long-term effects of the experimental manipulations.

For reasons previously discussed the auditory channel was used for the administration of an aversive stimulus. Whether or not the particular stimulus used was optimally efficacious could not be determined by the present design. Studies of the relative value of alternate punishments and positive reinforcers would appear to be logical extensions of this study. Of particular utility would be the exploration of treatments that could be administered in a natural setting. One suggestion, for example, would be the utilization of a classmate as an administrator of the experimental contingencies as a means of relieving the teacher of this responsibility. Or, automatic devices designed for specific blindisms could be developed to trigger a stimulus upon the occurrence of the behavior in question.

APPENDIX

OBSERVATION FORM

Subject______________ Date_________ Time_____-______ Class___________

Observer___________________________

		Rocking	Eye Poking	Head Rolling	Other	Other
1st 5 min.	Freq.					
0-5	Time					
2nd 5 min.	Freq.					
5-10	Time					
3rd 5 min.	Freq.					
10-15	Time					
4th 5 min.	Freq.					
15-20	Time					

Comments:

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