

MODIFYING INAPPROPRIATE CLASSROOM BEHAVIORS

BY

PUNISHMENT AND POSITIVE REINFORCEMENT CONTINGENCY SYSTEMS

by

Jack Schonewille

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APPROVAL

Name: Jack Schonewille

Degree: Master of Arts (Education)

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Examining Committee:

Chairman: M. Manley-Casimir

P. Winne
Senior Supervisor

J. Martin
Assistant Professor

B. Wong
Assistant Professor
Faculty of Education
Simon Fraser University
External Examiner

Date approved June 21, 1977

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Modifying Inappropriate Classroom Behaviors by Punishment
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Author:

(signature)

Jack Schonewille

(name)

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(date)

ABSTRACT

Creating and maintaining a classroom environment which facilitates students' learning is one of the most crucial problems faced by every teacher. Behavioral approaches to classroom management are known to be effective. In the last decade, educational research in this area has shown that behavioral contingency systems are feasible and effective techniques which teachers can use to help manage classroom behaviors.

In extending the literature, this study examined: (a) the relative effectiveness of two behavioral contingencies, a positive reinforcement and a mild punishment, for modifying students' classroom behaviors; (b) the feasibility of a classroom discussion as a means for involving students in creating the kind of environment they view as conducive to learning, and in determining the positive and negative consequences of on-task and off-task behaviors; and (c) the ability of the teacher to monitor and implement a group-oriented management system for promoting learning related student behaviors.

Three different kinds of interventions were examined in a longitudinal experimental design for their effectiveness in reducing students' inappropriate classroom behaviors. In teacher-led discussion, the students identified specific inappropriate behaviors they perceived as disruptive to learning. The students also identified activities they considered rewarding for their appropriate behavior during instruction. A short-term punishment contingency applied to the group as a whole assessed demerit points for individual's inappropriate

behaviors. A short-term positive reinforcement contingency awarded merit points to the group as a whole for the time intervals during which no individual behaved inappropriately. A reversal phase determined the relative effectiveness of the two contingency systems. Each contingency system was followed by a long-term reinforcement/punishment contingency consisting of a special activity applied/withheld to the whole group.

The data showed both contingency systems to be effective in reducing the frequencies of the students' inappropriate responses, but the positive reinforcement contingency was more effective in reducing the frequency of inappropriate verbal responses. No conclusive differences in effectiveness were obtained for the two contingency procedures for out-of-seat and miscellaneous disruptive responses. The discussion by itself was also effective, but not to the same extent as the contingency procedures.

This study, conducted under normal classroom conditions, has direct implications for teachers. Contingency procedures were shown to be practical and feasible for a teacher to use to effectively manage classroom behaviors of students in a group situation. Either or both of the short-term contingency procedures, complemented by a long-term reinforcement/punishment contingency, was found to be effective. Involving students in determining the procedures was functional, and also may model productive social interaction for students. Achieving a successful technique to manage classroom behaviors allows a teacher to concentrate energies on the business of education, namely, assisting students to learn.

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CHAPTER I


THE PROBLEM OF MANAGING CLASSROOM BEHAVIOR

Creating and maintaining a classroom environment which promotes students' learning is one of the most crucial problems faced by every teacher. Of particular concern to both classroom teachers and administrators are the students' inattentive and disruptive behaviors because these are incompatible with attending to schoolwork (Ferritor, Buckholdt, & Smith, 1972). There are divergent views about the causes of students' inattentive and disruptive behaviors. However, there is general consensus that teachers require practical and efficient techniques in getting children 'ready to learn' so that their technical skills of teaching may have optimal effect (Madsen, Becker, & Thomas, 1968). In order to be effective, then, teachers first need to develop appropriate methods to manage the classroom behaviors of their students.

Student classroom behaviors can be grouped in two broad categories. On the one hand, students may behave in a way conducive to the learning process. Examples of such behaviors, labelled appropriate or on-task, are attention to the teacher, completion of assignments or following instructions in the classroom. On the other hand, students may exhibit behaviors not conducive to the learning process. Examples of such behaviors, labelled inappropriate or off-task, include being out-of-seat without permission, talking to each other, or inattention to seatwork.

✓ Teachers have traditionally used two basic kinds of disciplinary methods to establish an environment within which teaching effectiveness can be maximized. [Aversive methods consist of showing disapproval for, or punishing inappropriate student behavior.] Verbal as well as limited phys-

ical punishers are aversive measures which have been, and still are, used in some classrooms in an effort to increase students' attention to their schoolwork. (In contrast, positive methods consist of showing approval or otherwise rewarding appropriate student behavior.) Verbal praise and positive physical contact often are used in this manner to increase appropriate student behaviors. In the last decade, educational research has shown that behavioral contingency systems, which use aspects of both traditional methods of classroom management, can be used systematically to establish and maintain appropriate classroom behaviors and create a classroom environment which promotes learning.



The purpose of this study was to measure the relative effectiveness of a short-term punishment contingency system and a short-term positive reinforcement contingency system for reducing the frequency of specific inappropriate student behaviors in a classroom situation. Both short-term contingency systems were followed up by a long-term reinforcement/punishment contingency for which criterion levels had been set. Although both types of systems have been used successfully independently of each other (Barrish, Saunders, & Wolf, 1968; Hall, Fox, Willard, Goldsmith, Emerson, Owen, Davis, & Dorcea, 1971), not many studies have applied both systems jointly to the same group. An added feature of this research was that a reversal procedure was used to ascertain the relative effectiveness of each system.

CHAPTER II
REVIEW OF THE LITERATURE

General Theory of Contingency Systems

Contingency systems are based on the fundamental premise that all behaviors are learned (Skinner, 1953). According to this position, operant behaviors are emitted by organisms spontaneously rather than being elicited by any known environmental or physiological stimuli. The different consequences of the emitted behaviors determine the likelihood that the organism will repeat those behaviors (Gage & Berliner, 1975). Two kinds of consequences are basic to the operant conditioning of behaviors. A reinforcer is defined as a stimulus which follows a student's response and tends to strengthen the probability of recurrence of that response. A punisher is defined as a stimulus following a response which tends to decrease the likelihood that the response will recur.

In developing the position of operant learning, Skinner primarily used animals as subjects for experimentation. Later, scientists successfully applied similar principles and techniques to behavior in human environments. A recent yearbook of the National Society for the Study of Education (Thoresen, 1975) described a range of applications of operant learning to education. That collection of articles clearly indicates the value of applying these principles and techniques to everyday classrooms.

In applying the operant principles to the classroom situation, students' deviant and socially acceptable behaviors are thought to be acquired and maintained by a reciprocal interaction between a behavior and its controlling environment. For example, children who display friendly behavior usually generate an amicable environment which, in turn, strengthens

the recurrence of their friendly behavior. Thus, the type of behaviors a person exhibits partly determine his environmental contingencies, which, in turn, influence his behaviors (Bandura, 1969).

According to Madsen, Becker, and Thomas (1968), teachers can be taught to effectively use their own behavior contingent upon the behavior of their students to effect a desirable change in the students' behaviors. In this manner, children can be made co-respondents in the learning process by a teacher who has learned how to use contingency systems (Becker, 1973). Some of the basic aspects of contingency systems are described in the following section.

Description of Contingency Systems

In the context of schooling, contingencies may be defined as formalized bonds or relationships between particular classes of student behaviors and the consequences these behaviors produce. When teachers use contingency systems, they respond in specific and consistent ways to particular student behaviors. Although there are many aspects to contingency systems, two basic types of contingencies - reinforcement and punishment - are relevant to this study.

There are two kinds of reinforcement procedures a teacher can use. In the first kind, positive reinforcement, the teacher provides a reinforcer contingent upon appropriate student behaviors. Through response generalization, this reinforcer tends to increase the frequency of similar appropriate behaviors even though the reinforcer is provided only upon the occurrence of specific appropriate behaviors (O'Leary & Drabman, 1971). Such reinforcers may be intrinsic to the classroom, meaning that they are associated with and compliment classroom operations. Examples of intrinsic reinforcers

are free time, participation in a special event related to school, extra gym or recess time, games, and so on. Reinforcers also may be extrinsic to normal classroom operations. Candy, trinkets, and money are examples of extrinsic reinforcers (O'Leary & Drabman, 1971). Results obtained by Whitlock and Bushell (1967) and by Wolf, Giles and Hall (1968) indicated that extrinsic incentives are often essential in the early stages of behavioral change programs to establish contingencies. However, extrinsic reinforcers can be phased out if they are systematically coupled with verbal, social or other intrinsic stimuli which, in time, will become the functional intrinsic reinforcers.

The second kind of reinforcement procedure, negative reinforcement, occurs when a teacher withdraws an aversive stimulus upon the occurrence of specific appropriate behaviors. This withdrawing is not a punisher because it tends to increase rather than decrease the recurrence of the appropriate behaviors. Both positive and negative reinforcement procedures strengthen appropriate behaviors.

As with reinforcement contingencies, there are two forms of punishment contingencies. The first involves the presenting of an aversive stimulus, such as a verbal or gestural reprimand, or physical punishment such as spanking upon the occurrence of inappropriate behavior (Bandura, 1969). This procedure is known as punishment type I and is generally objected to for two reasons. The first is an ethical aversion for strong punishment in and of itself. Second, the possible side effects of such punishment are undesirable. Specifically, the teacher's use of punishment type I provides an inappropriate model of behavior for the student; the child may learn to suppress the inappropriate behavior only when there is the threat of punishment; and the child may learn to avoid the situation

or vicarious learning can kick in
 observe teacher spanking child
 & then

where the punishment occurs, i.e. the school (Sherman, 1973).

A second form of punishment contingency, known as punishment type II, involves the withdrawal of a positive reinforcer for inappropriate behavioral responses. This punishment contingency does not have the aforementioned undesirable side effects, while it ensures that a positive reinforcer is made available to the child if the inappropriate behaviors do not occur.

The Effectiveness of Contingency Systems

As an alternative to traditional verbal and physical disciplinary actions, (research has substantiated that contingency systems can significantly reduce and modify student behaviors.) Barrish, Saunders, and Wolf (1969) reported that contingency procedures effectively reduced talking-out and inappropriate out-of-seat behaviors for a grade four class, during both arithmetic and reading periods. Schmidt and Ulrich (1969) replicated Barrish, et al.'s procedures, achieving similar positive results with grade four and grade two groups, as did Medland and Stachnik (1972) with grade five students. Bandura (1969) cited numerous studies which successfully demonstrated the effectiveness of contingency systems in remedial academic programs for school drop-outs and low achievers (Clark, Lackowicz, & Wolf, 1968; Wolf, Giles, & Hall, 1968), for managing classroom behavioral disorders (O'Leary & Becker, 1967), and in fostering productive classroom behavior (Hall, Payan, Rabon, & Broden, 1968). A reduction in inappropriate behaviors has been shown to be instrumental in allowing more material to be covered (Medland and Stachnik, 1972), positively related to improvements in academic performance and positively correlated with improvements in 'classroom atmosphere' (Madsen, Becker, & Thomas, 1968).

Bandura (1969) identified three variables which influence the

effective implementation of reinforcement procedures. First, it is essential to devise a contingency system which can maintain a high level of responsiveness by the students who will be participating in the contingency system. By having them identify the specific behaviors to be modified and the reinforcers is one way to meet this condition. Second, the reinforcers must be made contingent upon the occurrence of the desired behaviors. More about this will be said in the next section. Third, the reinforcer must be 'strong' enough to ensure an adequate frequency of desirable responses for them to become firmly established.

In order to increase the frequency of students' appropriate behaviors, tokens such as poker chips, stars, or check marks exchangeable for extrinsic reinforcers such as candy, food, games, or trinkets, may at first be necessary (Staats, 1973). By coupling these extrinsic reinforcers with verbal and social reinforcers such as 'Good', or teacher attention, over time, the latter will become sufficient to maintain the desired appropriate behaviors.

In many classrooms, rules and regulations about inappropriate behaviors are clearly laid out. Yet students, sometimes, continue to misbehave. In dealing with individuals in a group situation, Madsen, Becker and Thomas (1968) concluded that rules alone exert very little effect on classroom behaviors. [Rules must have consequences.] Specifically, they found that the key to effective classroom management was in ignoring inappropriate behaviors (unless destructive or harmful to others) and in giving approval for appropriate behaviors. This was also the basis for Becker's (1973) statement that appropriate student behavior is a function of the teacher's behaviors. Consider the following example in which a teacher's attention to students' disruptive behaviors may be dysfunctional when analyzed in

terms of behavioral contingencies. Reinforcers, as indicated earlier, are contingent upon the behaviors which precede them. If a behavior is not positively reinforced, that behavior will diminish in frequency of occurrence, i.e., it will extinguish (Staats, 1973). Teacher attention is usually a reinforcing stimulus. Thus, a teacher attending to students' disruptive acts, for example, by commenting loudly on an outburst of student laughter, may increase the frequency of that behavior because the teacher's attention, even though intended to be punishing, may act as a reinforcer (Staats, 1973; Becker, 1973). Thus, aversive attention conditional upon disruptive behaviors may actually increase rather than decrease or eliminate inappropriate behaviors (Staats, 1973). On the other hand, if the teacher's attention is removed (punishment type II) and a quietly administered reprimand is substituted (punishment type I), it usually has an extinguishing effect on the deviant behavior (Becker, 1973). Therefore, teacher attention should be made contingent upon the occurrence of behaviors which are closer and closer approximations of appropriate student behaviors rather than upon disruptive behaviors as typically done by teachers.

In reviewing the literature on contingency systems, O'Leary and Drabman (1971) recommended that in order for the findings of a study to be generalizable to other classrooms, some, if not most, of the following are of importance: (1) a good academic program; (2) a high level of academic expectation by the teacher and the students; (3) student involvement in selecting the target behaviors; (4) varied contingency schedules; and (5) a procedure for gradually extinguishing the extrinsic, formalized reinforcement contingencies and replacing them with verbal and social reinforcers such as positive teacher attention. In addition, there are other aspects of a successful contingency system which an experimenter needs to consider

in determining a specific contingency system for a particular situation. The following section deals with these.

Important Aspects of Contingency Systems

Non-contingent systems. Hart, Lund, and Jackson (1968) found that only when reinforcers were made contingent upon the occurrence of appropriate behaviors or the non-occurrence of inappropriate behaviors did any reliable change in the frequency or rate of the appropriate behaviors occur. When the reinforcer was provided non-contingently, at randomly timed intervals without regard for the behaviors occurring at those times, it was found to be considerably less effective in promoting appropriate student behaviors (Bushell, Wrobel, & Michaelis, 1968; Hart, Lund, & Jackson, 1968).

The necessity for arranging appropriate reinforcers contingently also has been demonstrated by studies in which the reinforcers were shifted from a response-interval contingency (Lovaas, Berberich, Perloff, & Schaeffer, 1966; Baer, Peterson, & Sherman, 1967). During the response-interval contingency in which the reinforcers were made contingent upon the occurrence of a set number of appropriate responses, the response pattern was maintained at a consistently high level. However, when the reinforcers were made contingent on a time-interval, regardless of the responses made in that interval, there was a marked drop in the frequency and rate of the appropriate behaviors. Similarly, the frequency and rate of occurrence of appropriate behaviors were reduced when individuals were given the reinforcers in advance without any performance requirements (Ayllon & Azrin, 1965; Bandura & Perloff, 1967). In studying children between the ages of seven and ten, Bandura and Perloff (1967) observed that the performance of a control group which received the reinforcing event before the task was performed was similar to the perform-

ance of the group which received no reinforcement at all. The performance of the experimental groups which received contingent reinforcers, either externally from an agent or through a self-reinforcement arrangement, was at a significantly higher level. In support of these findings, Bushell, Wrobel and Michaelis (1968) reported that reinforcing pre-schoolers non-continuously reduced their amount of independent study, group participation, and cooperative study.

These combined findings strongly support the statement by Bandura (1967) that to be effective, reinforcers must be made contingent upon the occurrence of desirable, appropriate responses.]

Individual vs. group contingency systems. In a classroom, teachers have the choice of applying contingencies to individual class members or to the class as a whole. Hall, Lund and Jackson (1968) suggested that, although individual contingencies are effective and can be successfully carried out by a classroom teacher, it is more practical and equally effective to control classroom attention through the use of group-oriented contingencies. Wolf and Risley (1967) found that a group contingency technique was more effective in controlling an individual child's disruptive behaviors than an individual contingency system even though the group-oriented contingency provided only one-fifth the reinforcement to each group member as compared to the individual oriented contingency. They concluded that the teacher was able to enlist the student's peers as aids in modifying the behavior of their classmate. Schmidt and Ulrich (1969) supported these findings that contingency systems should be applied to students as a group rather than as individuals in order to accomplish control and eliminate behavior problems in a classroom situation. Herman and Tramontana (1971), in

dealing with a group of Head Start children, found that the groups with individually administered contingencies and the groups with group-applied contingencies responded similarly to reinforcement procedures. They tentatively concluded that it was easier to dispense one reinforcer to the class as a whole than to dispense one reinforcer to each class member. In their review of the literature dealing with contingency systems, Litow and Pumroy (1975) concluded that individually administered and scheduled contingencies for the responses of each group member were impractical and uneconomical. Thus, group-oriented contingency systems are more efficient behavior management systems and make positive use of the peer pressures which normally exist within the typical classroom as a social group.

Positive reinforcement vs. punishment contingencies. A positive contingency system applies reinforcers contingent upon the occurrence of cooperative and appropriate behaviors. This kind of system for managing the classroom is based on the premise that children will cooperate and work for that which brings them pleasure (Madsen & Madsen, 1970).

Although positive reinforcement contingencies have been found to be generally effective in modifying and controlling classroom behaviors, punishment contingencies can be equally effective when they take the form of a cost to the student for inappropriate behaviors. This is the case of punishment type II in which reinforcers are taken away upon the occurrence of inappropriate behaviors.

Two conditions must be met in order for this procedure to be effective (Becker, 1973). First, a clearcut method of earning back lost points or reinforcers must be available. Second, the punishment must be preceded by a warning signal which, later, can be used as a conditioned punisher. In

other words, the signal can alert the student that he/she will be punished if inappropriate behavior ensues, which promotes the non-occurrence of the inappropriate behavior.

Such a response-cost procedure has three advantages. First, it prevents inappropriate behaviors from being reinforced through teacher-attention because the conditioned punisher acts as a signal not to respond in an inappropriate manner. It also provides reinforcers only for appropriate behaviors. Since these are incompatible with the punished behavior, the punishable behavior is effectively removed from the repertoire of probable responses. Third, response-cost methods avoid the use of aversive punitive stimuli by which the students learn to avoid and escape the sources and situations of punishment, namely, the teacher and the school. Obviously, the school should not become a place to be avoided if effective learning is to take place.

A form of response-cost is the time-out procedure. In this method, the person emitting inappropriate responses is isolated from a socially reinforcing situation. The advantages of the response-cost methods outlined above work effectively to extinguish inappropriate behaviors.

Punitive actions by themselves, although effective in stopping inappropriate behaviors, do not indicate to the students appropriate behaviors to be substituted for the misbehaviors. Therefore, the most effective punishment contingency system relies on the response-cost procedure in which a warning signal acts as a conditioned punisher, and a clearcut method of earning back the reinforcer is available.

Summary and Hypotheses

The primary objective of schooling is two-fold, namely, that students

learn and that they be motivated intrinsically through the learning experience itself. However, learning or even the reinforcement it may produce often is not sufficient in itself to maintain the attention and behavior of young children engaged in extended learning tasks. Achievement, the acquisition of skills and accompanying social approvals also are products of learning, i.e., learned reinforcers, and their effectiveness depends on the individual's history of learning (Staats, 1973).

Research has substantiated that contingency procedures, properly used, encourage children to work for desirable reinforcers. This, in turn, helps to establish a pattern of appropriate behaviors that children follow and maintain even when, in time, the contingency procedures undergo extinction (Madsen & Madsen, 1970).

The purpose of this study was to determine the relative effectiveness of two different group-applied contingency systems for reducing the frequency of inappropriate behaviors in a classroom situation. Specifically, the study examined the effects of two short-term contingency systems, one a positive reinforcement system and the other a mild punishment type I system, each followed by a long-term positive reinforcement/punishment system. It also attempted to document the occurrence of positive side-effects, in the form of on-task behaviors, over the experimental period. To these ends, the study tested the following hypotheses:

- A. During both the positive reinforcement and the punishment type I contingency periods there will be a consistent and significant decrease in the frequency and rate of occurrence of the specific inappropriate responses.
- B. The short-term positive reinforcement contingency system will produce a greater decrease in inappropriate responses than the

short-term punishment type I contingency system. Since appropriate and inappropriate behaviors are incompatible in that they can not occur together, the punishment type I may decrease inappropriate responses, but will not positively reinforce appropriate responses (Dreikurs & Cassel, 1972).

- C. The percentage of on-task behaviors, although they are not specifically reinforced, will significantly increase over the contingency periods. Behaviors are groups of responses which develop together such that when one is modified, others, with similar characteristics, also are modified even though not directly reinforced.

This study extends previous research in three distinct areas. First, it measures the relative effectiveness of each contingency system being applied to the same group by a reversal procedure. Second, the study recorded not only the occurrence of specified appropriate behaviors, but related appropriate behaviors as well to determine if the modification of the specific target behaviors generalized to associated responses within the same class of behaviors. Lastly, the participating children were actively involved in selecting the behaviors to be modified, in selecting the contingent reinforcer, and in determining the criterion used for applying the reinforcer.

CHAPTER III

METHOD

Subjects and Setting

The teaching environment in which the study occurred was one area of a multi-area teaching space involving 95 students in the sixth and seventh grades. The children had attended this school for all their elementary schooling and were accustomed to open area teaching styles. During the study itself there were five teachers in the area who individually taught a distinct, but more or less homogeneous group of students. The groups had been formed earlier in the year on the basis of the students' performance on a teacher-made test on the basic arithmetic operations using whole, fractional and decimal numerals, and ratio and percent.

The students participating in the study were a group of six grade seven students (three boys and three girls) and sixteen grade six students (eight boys and eight girls) judged to be of average ability. They had shown mastery of the basic operations involving whole numbers, but had some difficulties in performing the arithmetic operations involving common and decimal fractions and with ratio and percent. Informal observations revealed that the group as a whole was talkative and easily distracted from their tasks. The teacher usually spent considerable time urging students to attend to the lessons. Unfortunately, this strategy seemed to produce the antithesis of the desired results. Specifically, the frequency of the inappropriate behaviors attended to by the teacher seemed to increase. As an alternative, the teacher decided to use a form of behavior modification in order to have the group as a whole attend to the lessons or assignments without interruptions. The specific strategy used was essentially an improvisation of the 'good behavior game' as developed by Barrish, Saunders and Wolf (1969)

and Medland and Stachnik (1972).

Behavioral Definitions

Two sets of behaviors were identified. Initially, the teacher selected a set of behaviors based on those used by previous experimenters (Barrish, Saunders, & Wolf, 1969), with modifications to fit the particular classroom. The behaviors in this set are hereafter referred to as general off-task behaviors and are listed in Table 1.

The off-task behaviors were grouped into three classes of behaviors: verbal, out-of-seat, and disruptive. The rationale for creating the three classes was that specific off-task behaviors within each class were thought to be related to one another and often function as a class in decreasing student learning efficiencies of individuals and of a group.

The second set of behaviors was specified in cooperation with the students through a discussion led by the teacher. The teacher began the discussion by expressing a need for appropriate, i.e., on-task, behavior by the students to permit them to maximize their academic learning. By means of leading questions from the teacher, the students suggested specific behaviors which they considered inappropriate and to interfere with their learning. The behaviors listed by the students were generally equivalent to the off-task behaviors selected by the teacher as can be seen in Table 1. The primary difference between the two lists is that the teacher-selected behaviors were more specifically operationalized to minimize the need for subjective interpretation by an observer. The students then ranked the behaviors they judged most disturbing, the top five of which were made into a subset of behaviors to be modified, hereafter referred to as target off-task behaviors (Table I). A sixth behavior, out-of-seat within the area, was

Table I

Off-Task Behaviors

Classes	General Off-Task Behaviors	Students' Off-Task Behaviors
Verbal	Talking or whispering to other students.* Talking or reading audibly to oneself. Calling out answers. Calling out for the teacher. Calling out to other students. Making verbal noises such as exclamations.	Whispering to other students. Talking during classtime. Talking while the teacher is talking. Asking unnecessary questions.
Out-of-Seat (without permission)	Out-of-seat within the area getting a drink of water; sharpening a pencil, etc.* Leaning over another's desk while in the seat.* Leaving the area to go to the library, washrooms, etc. Tipping the chair and/or desk.	Leaving the desk. Leaning over a desk while out of the seat. Looking at someone's book.
Disruptive	Kicking or tripping another student, a desk or a chair.* Hitting another student.* Taking things from others.* Making noises such as tapping, drumming, or whistling. Turning around in the desk.	Kicking or bumping against a chair or a desk. Poking others with pencils, rulers, pens, etc. Tapping on someone's arm, back or other part of the body. Taking things from desks. Putting things on desks. Tapping or drumming. Making noises while getting a drink. Throwing erasers or other objects.

Note: An * indicates a target off-task behavior to be modified during the study. Approximately equivalent behaviors appear in the same row.

selected by the teacher and, with approval of the students, became part of the target off-task behaviors. Since the target behaviors are representative of the class to which they belong, reducing their frequency of occurrence might have a generalization effect on the class of behaviors as a whole.

The students were also involved in selecting the long-term reinforcer by suggesting possible and desirable contingency events. The events suggested by the students included: (a) five minute intervals of free time outside each time a session successfully meets the criterion level, (b) participation in Math games once a week for a whole session, (c) an unstructured period once a week to catch up on assignments, (d) elimination of homework on a regular basis, and (e) a spelling bee once a week. The teacher, with the agreement of the students, operationalized one of their suggestions, namely, the elimination of homework every second session for which the conditions established for the attainment of this reinforcer had been met.

Experimental Design

The experimental design consisted of six phases as pictured in Figure 1. The description of each phase follows.

Figure 1. Phases of Experiment.

Baseline I 5 sessions	Interven- tion I 9 sessions	Interven- tion II 8 sessions	Interven- tion III 8 sessions	Reversal Inter. II 8 sessions	Baseline II 8 sessions
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Baseline I. For this phase an independent observer merely recorded the frequency of the general off-task behaviors (Table I). No imposed

contingencies were in force during this phase.

Intervention I. This intervention consisted of the discussion between the teacher and students about the disruptive behaviors and their interference in the learning process. This discussion was held between the fifth and sixth sessions. No changes were made in the recording of the general off-task behaviors as observed in Baseline I. No prescribed contingencies were in force for any of the nine sessions of this phase.

Intervention II. For this phase the students were informed that a short-term punishment contingency and a long-term reinforcement/punishment contingency would be in effect. The short-term punisher consisted of a demerit point (punishment type I) assessed to the group for each target off-task behavior emitted by any individual student in the group. The long-term reinforcer was the contingent event selected by the students, namely, the elimination of homework every second session. This reinforcer would be withdrawn if criterion levels previously established had not been met. Thus, the long-term contingency event could be either positive reinforcement or punishment type II.

The criterion level was determined with reference to the Baseline I data. Since the average frequency of the target off-task behaviors during Baseline I was approximately 60 behaviors per session, the teacher and the students agreed upon the criterion level of 30 points (i.e., 30 behaviors). The teacher recorded the number of demerit points on the blackboard so that the students would be continuously aware of their performance. This phase lasted for eight sessions.

Intervention III. For this phase the students were told that a short-term positive reinforcement contingency and a long-term reinforcement/punishment contingency procedure would be used. The short-term reinforcer consist-

ed of merit points awarded to the group for successful time intervals during which none of the target off-task behaviors were emitted by anyone in the group. An interval of two minutes was suggested by the teacher on the basis of some spot checking while Intervention II was in progress. A criterion level of ten, two-minute intervals was agreed to by the students and the teacher. This constituted roughly 57% of class time. The long-term reinforcement/punishment contingency was the same as for Intervention II. This phase lasted for 8 sessions.

The rationale for using a punishment type I contingency during Intervention II and a positive reinforcement contingency during Intervention III was as follows. The application of a punisher does not indicate appropriate behaviors to students: only those behaviors not to be performed. The positive reinforcer, however, does indicate to the students which behaviors are appropriate. Thus, the contrast between these two contingencies would allow an assessment of the possible differences between these two systems for reducing the frequency of the target and general off-task behaviors.

Reversal. At the beginning of the thirty-first session the teacher explained that the conditions for Intervention II would again be in effect. This phase lasted for eight sessions.

Baseline II. This phase was a return to the conditions of Intervention II, namely, the condition of students being aware of the off-task behaviors but with no contingencies in force for these behaviors. It was introduced by simply telling the students that the interventions and contingent events would no longer be in effect. A fourteen-day Christmas vacation interrupted this phase from the Reversal phase. This phase lasted for eight sessions.

Observation and Recording Procedures

Observations were made between 1:05 p.m. and 1:40 p.m. each day for the entire study. There were two separate observation schedules kept by two different observers.

Schedule I: Off-Task Behaviors. An independent observer recorded each occurrence of the general off-task behaviors (Table I) for the entire study (See Schedule I, Appendix A). Since the target off-task behaviors were a subset of the general off-task behaviors, a continuous observation record of the target behaviors was also obtained even though these were not yet identified prior to Baseline I.

Schedule II: On- and Off-Task Behaviors. A second independent observer recorded the students' on- and off-task behaviors throughout the study in order to identify any unintended effects resulting from either contingency system. The on-task behaviors were separated into two categories (See Schedule II, Appendix B). 'Hard' on-task behaviors were those about which there were no doubts that they were on-task, e.g., when students were using their pencils to work problems, responding to the teacher appropriately, and so on. 'Soft' on-task behaviors were those which required the observer to use some discretion, as when the students appeared to be listening to the lesson, reading the assignments or finished with the task assigned but were not engaged in off-task behavior.

The off-task behaviors included all the off-task behaviors in Table I. A distinction was made between off-task responses which were self-initiated by the student observed and those which were initiated by others (Appendix B). If a student who was being observed initiated the behavior, it was categorized as 'self-initiated'. If, while the student was being observed, another student initiated his/her off-task behavior, the response was classified as 'other-initiated'.

Schedule II employed a time-sampling procedure in which each student was observed in a predetermined random order for a ten second interval. The recording was done in rows of squares with each column representing a ten-second interval. The behaviors were listed, and for each student observed, a check was made in the appropriate box opposite the behavior exhibited by that student. The observer used an earphone to monitor a tape recording which had a ten-second signal indicating the passage of the time interval. In this manner, the observer could continuously observe the individual students without having to watch a timing device.

In order to record on-task behavior, the student was required to exhibit on-task behavior for the total interval. If at any time during the ten-second interval the student exhibited off-task behavior, the entire interval was recorded as off-task. The rationale for this was that if a student engaged in off-task behavior during such a short time interval, it seems reasonable to assume that on-task concentration was seriously disrupted.

The time-sampling procedure yields an estimate of the percentage of time spent in on-task and off-task behaviors. Bushell, Wrobel, and Michaelis (1969) used this technique to validate the assumption that, in a given situation, the behavior observed at fixed intervals adequately represents the behaviors as they occurred during the total interval. If a child's behaviors are observed seven times during a daily observation period and the on-task behaviors were observed four times, then the rate of on-task behavior for that child would be four-sevenths. The rate of on-task behavior for the group as a whole would be the sum of all the individual scores. The percentage of on- and off-task behaviors was calculated as the number of on- or off-task responses, divided by the total number of responses, and multi-

plied by 100.

Teacher observations. The teacher observed and recorded the frequency of the target off-task behaviors as defined by the discussion with the students in Intervention I (Table 1). Each time any one of the target behaviors occurred during Interventions I, II, and Reversal, the teacher recorded it on a hand-held manual counter. This count made by the teacher was used to determine whether the students achieved the contingent event.

During Intervention III, the teacher, by means of a stopwatch, recorded the number of completed two-minute intervals during which no student exhibited any of the target off-task behaviors.

Training of Observers

Prior to the study, there was a one week training period for both the teacher and the two independent observers. The two independent observers used both observation schedules and acted as interobserver reliability checks for each other during the training period. When Schedule I recording sheets were used, the teacher also recorded the frequency of some arbitrarily selected target behaviors. In this way, training was continued until a high degree of interobserver reliability was established. In addition, several reliability checks were made at various points throughout the study with both independent observers using the time-sampling observation schedule or the off-task observation schedule at a time of day different from that during which the experiment was conducted.

Throughout the study, with the exception of Intervention III, the teacher's recordings of the frequency of the target behaviors were used as rough interobserver reliability checks between the teacher and the independent observer using Schedule I. Since the target behaviors were a subset of the

general off-task behaviors, it was thought that a high degree of interobserver agreement for the target behaviors would be a strong indication of the reliability of the frequency of all the general off-task behaviors.

CHAPTER IV

RESULTS

Reliability of Observations

The reliability of the on-task observations obtained using Schedule II was analyzed three times during the training sessions and once during the fifth phase. Interobserver agreement between the primary observer and the reliability observer was calculated by dividing the number of intervals for which there was perfect agreement by the total number of intervals, multiplied by 100. These proportions ranged from 69% to 100%, with a mean of 89%.

The reliability of off-task behavior observations from Schedule I was analyzed twice during the training sessions and twice during the study. Agreement was analyzed separately for each class of responses (verbal, out-of-seat, and disruptive) and calculated by dividing the smaller number of responses observed by the larger number of responses observed, multiplied by 100. The ranges and means of the interobserver agreements for each class of responses were: verbal responses (93% - 98%; M = 96%), out-of-seat responses (71% - 98%; M = 82%), and disruptive responses (84% - 91%; M = 87%).

The two observation schedules were different. Schedule I was used to record the response frequencies of the off-task behaviors for each session. Schedule II was used to record the on-task behaviors over time intervals during each session.

In addition, the reliability of the group of target off-task responses was analyzed for each session of the study except during Baseline I and Intervention III. Interobserver agreement between the teacher and the

independent observer using Schedule I was calculated in the same way as for the general off-task behavior observations. The percentage of agreement ranged from 30% to 100%, with an average of 81% and a standard deviation of 15.9. This standard deviation indicated large discrepancies between the observations by the teacher and the independent observer. In comparison, the percentage of agreement in observations for the target off-task behaviors recorded by the primary and reliability observers during the training and analysis sessions ranged from 87% to 97%, with an average of 91% and a standard deviation of 2.

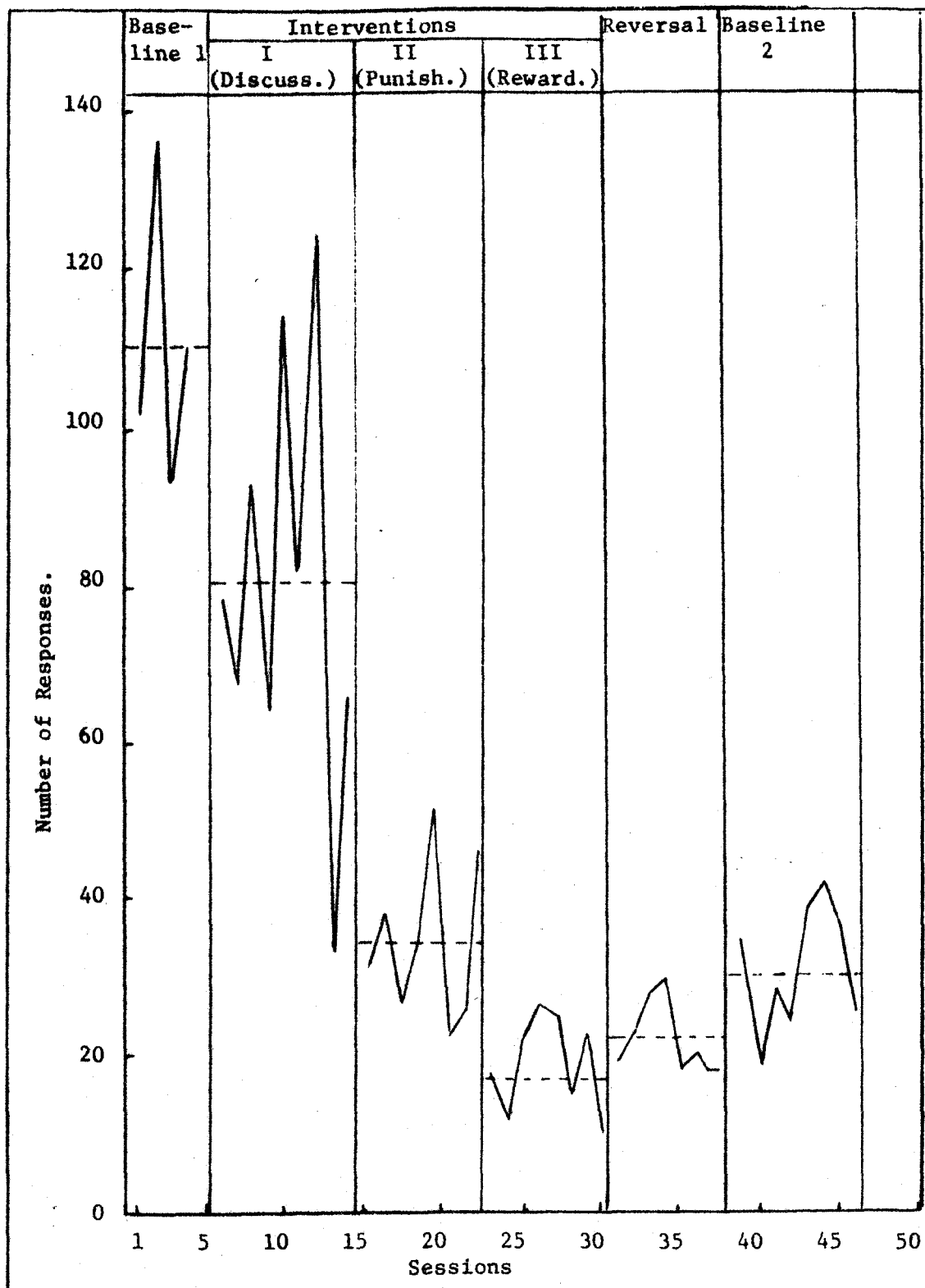
Overall Behavioral Responses

General off-task behaviors. Figure 2 shows the extent to which the general off-task behaviors were influenced by the experimental manipulations. Descriptive statistics for the frequencies of behaviors in each phase are summarized in Table II.

The data for Baseline I indicate that the mean frequency of the general off-task behaviors was 110, with a standard deviation of 16.7. This mean frequency of responses decreased to 80 as a result of Intervention I, but recorded the greatest fluctuations as evidenced by the standard deviation of 26.4. The mean frequency continued to decrease for Intervention II to 34 and Intervention III to 18. Reversal showed a slight increasing trend to a mean of 21, which continued during Baseline II to a mean of 30. As the mean frequencies of responses decreased the behaviors stabilized and showed less fluctuation as measured by the standard deviations (Table II).

Target behaviors. The data reported for the target off-task behaviors were based on the frequency of responses as recorded by the independent observer using Schedule I (Figure 3). The data are summarized in Table II.

Figure 2. General Off-Task Behaviors.



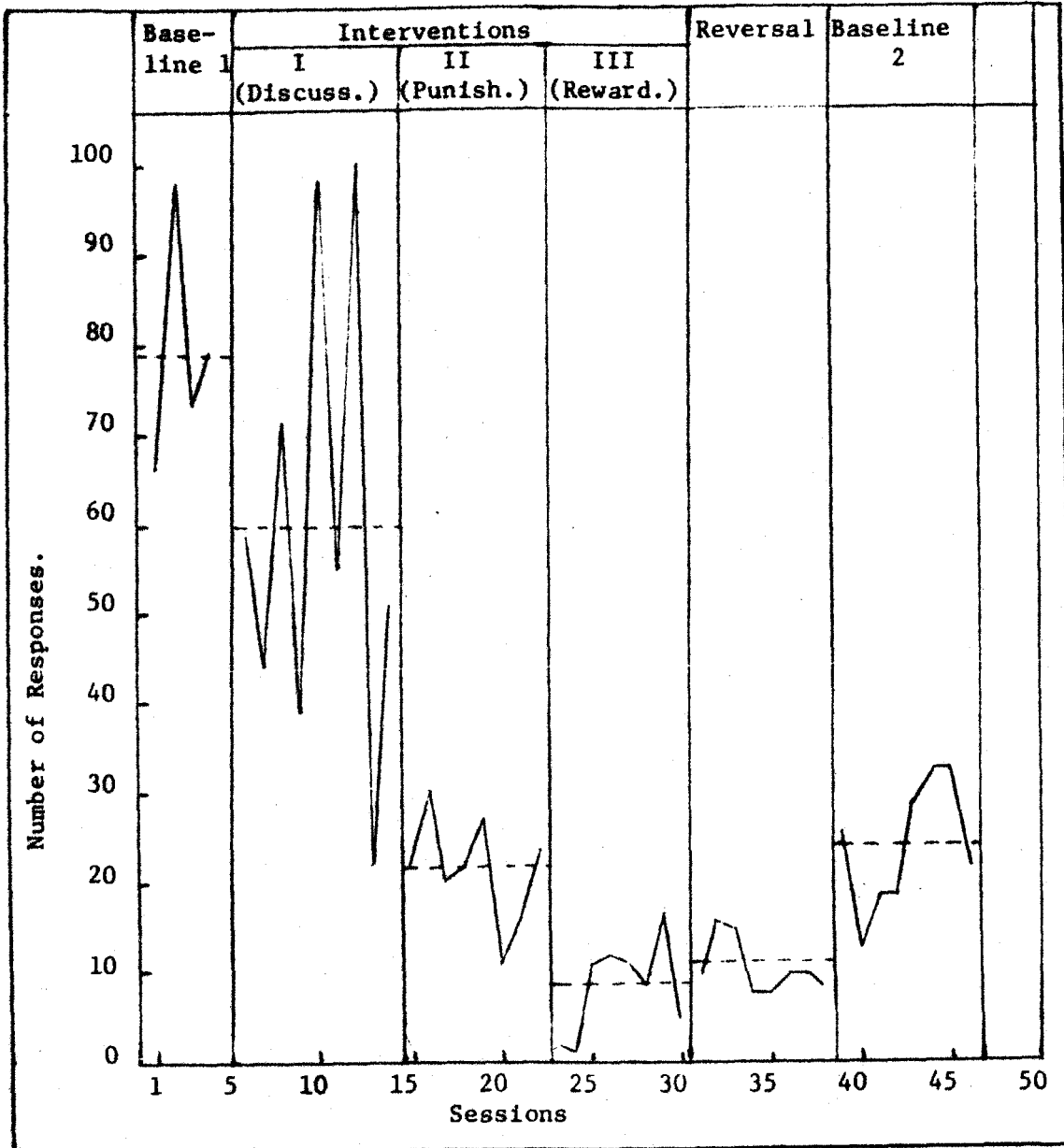
Note: ----- indicates mean frequency.

Table II
Comparison of Frequencies of Off-Task Behaviors For Each Phase

Behaviors	Phases										
	Baseline I			Interventions				Reversal			Baseline II
		I (Discuss.)	II (Punish.)	III (Reward.)							
General Off-Task	Grouped	92 - 137	33 - 124	22 - 51	11 - 26	17 - 29	18 - 41				
	Range	110	80	34	18	21	30				
	Mean	16.7	26.4	9.8	6.0	6.6	9.2				
	S.D.										
	Class A	52 - 87	16 - 92	7 - 27	1 - 15	7 - 18	13 - 33				
	Range	70.3	56.8	19.1	6.9	9.6	21.6				
	Mean	16.3	24.3	7.5	2.8	3.4	6.2				
	S.D.										
	Class B	11 - 31	7 - 26	1 - 10	2 - 8	1 - 7	2 - 12				
Range	20.8	13.4	6.5	4.6	3.9	5.5					
Mean	6.8	5.8	2.8	2.7	1.7	3.0					
S.D.											
Class C	11 - 29	4 - 18	3 - 14	3 - 12	5 - 10	2 - 6					
Range	18.8	9.8	7.8	6.6	7.6	3.3					
Mean	6.5	4.3	4.4	2.5	2.2	1.3					
S.D.											
Target Off-Task	Grouped	66 - 98	22 - 100	11 - 30	1 - 17	8 - 16	13 - 33				
	Range	79.0	59.9	21.5	8.5	10.6	24.3				
	Mean	11.9	24.3	5.6	5.0	3.0	6.8				
	S.D.										
	Class A	45 - 75	16 - 83	6 - 27	0 - 13	5 - 13	12 - 28				
	Range	62.0	50.0	18.0	5.5	7.5	20.0				
	Mean	14.3	21.6	6.6	4.1	3.0	5.4				
	S.D.										
	Class B	4 - 21	4 - 19	0 - 4	0 - 7	0 - 3	1 - 7				
Range	15.0	8.0	2.3	2.7	2.1	3.5					
Mean	6.5	6.2	1.5	2.0	1.1	2.1					
S.D.											
Class C	0 - 4	0 - 5	0 - 5	0 - 1	0 - 3	0 - 2					
Range	2.3	1.7	1.9	.3	1.1	.5					
Mean	1.5	2.2	1.8	.4	1.2	.7					
S.D.											

Note: Class A = Verbal Off-Task; Class B = Out-of-Seat Off-Task; Class C = Disruptive Off-Task.

Figure 3. Target Off-Task Behaviors.



Note: ----- indicates mean frequency.

The data for Baseline I indicate that the mean frequency of the target off-task responses was 79. The mean frequency of responses was lower during Intervention I, but showed the greatest fluctuation as indicated by the standard deviation of 24.3. The mean frequency of responses continued to decrease for Intervention II to 22 and Intervention III to 9. Reversal showed a slight increasing trend in frequency of responses to a mean of 11, which became more significant, in terms of classroom implications, during Baseline II to a mean of 24.

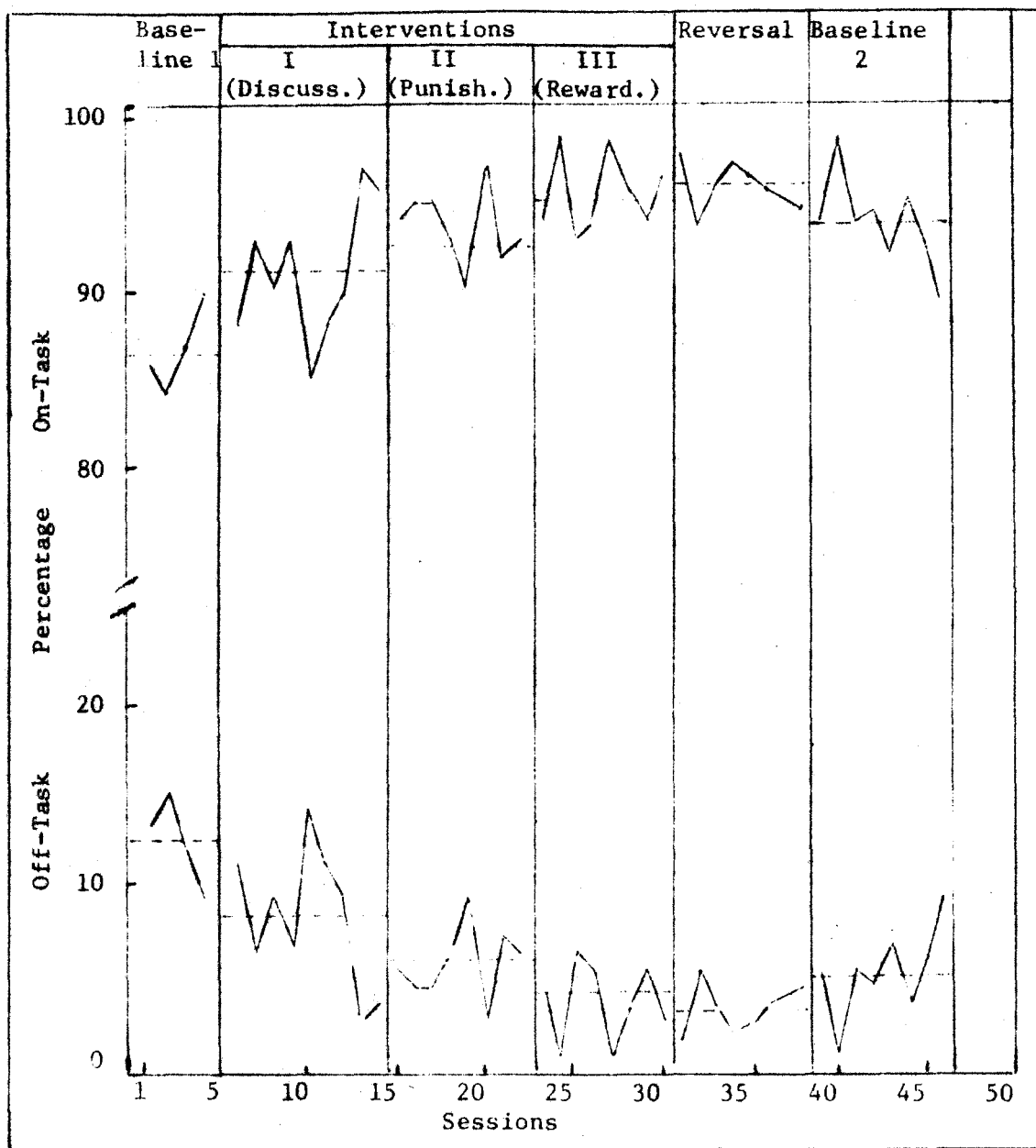
On- and off-task recordings. Figure 4 shows that the contingency procedures positively affected the general percentage of on- and off-task behavior of the students. There was an increase of about five percentage points in on-task behavior for Intervention I, with a further increase of two percentage points for each of Interventions II and III. This high level was maintained for Reversal. A decrease of about two percentage points was recorded for Baseline II.

Classes of Behavioral Responses

Figures 5 and 6 show the extent to which the classes of general off-task and target off-task behaviors - verbal, out-of-seat, and disruptive - were influenced by the contingency procedures. The comparisons of frequencies for the different response categories and classes are summarized in Table II.

Verbal Responses. The verbal responses were most frequent of all classes of general off-task and target off-task behaviors. The reduction in response frequencies was significant, for classroom implication, as a result of Intervention I for both the general and the target response categories. At the same time, this phase recorded the greatest standard

Figure 4. Percentage of On-Task and Off-Task Behaviors.



Note: ----- indicates mean percentage.

Figure 5. Classes of General Off-Task Behaviors.

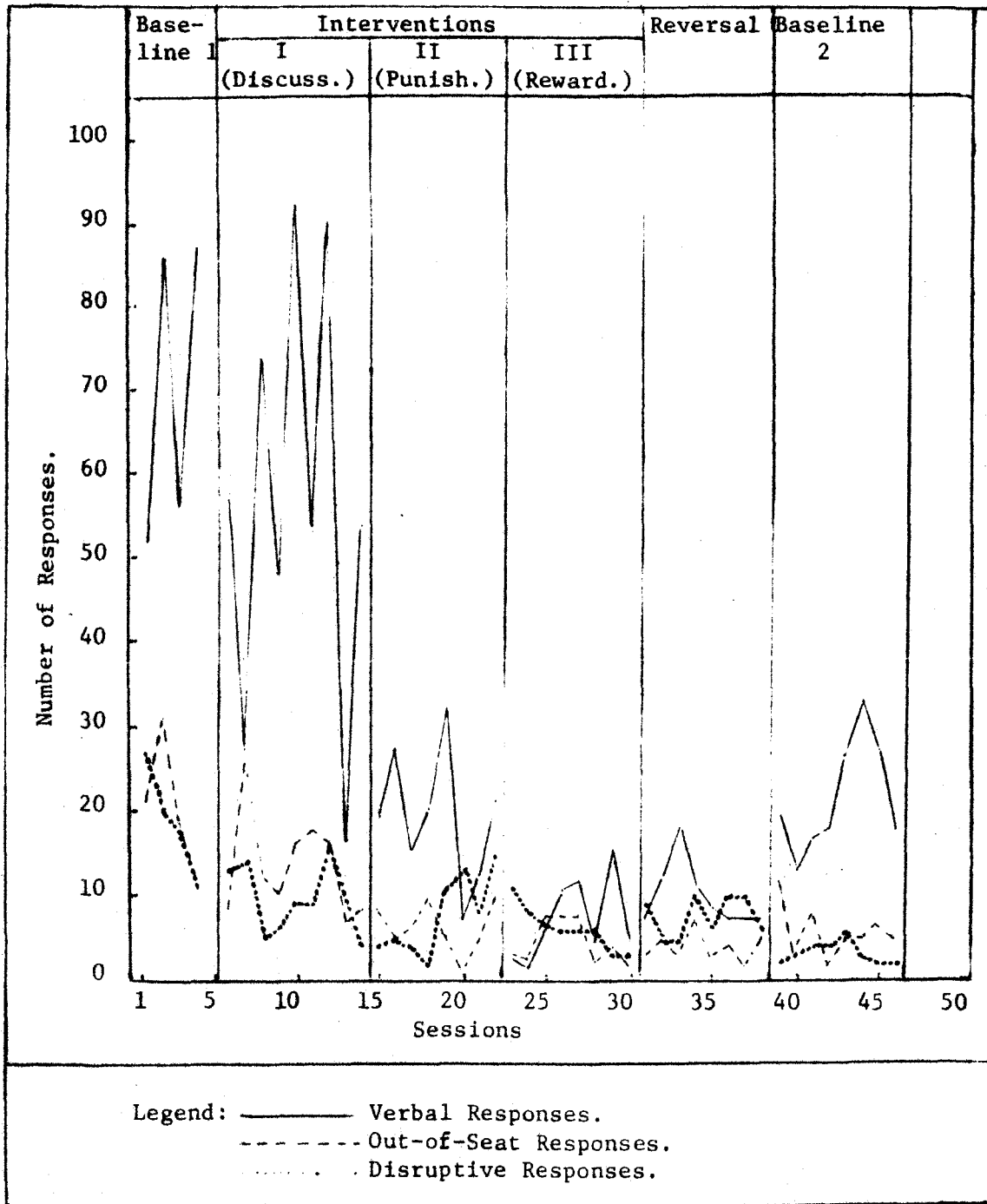
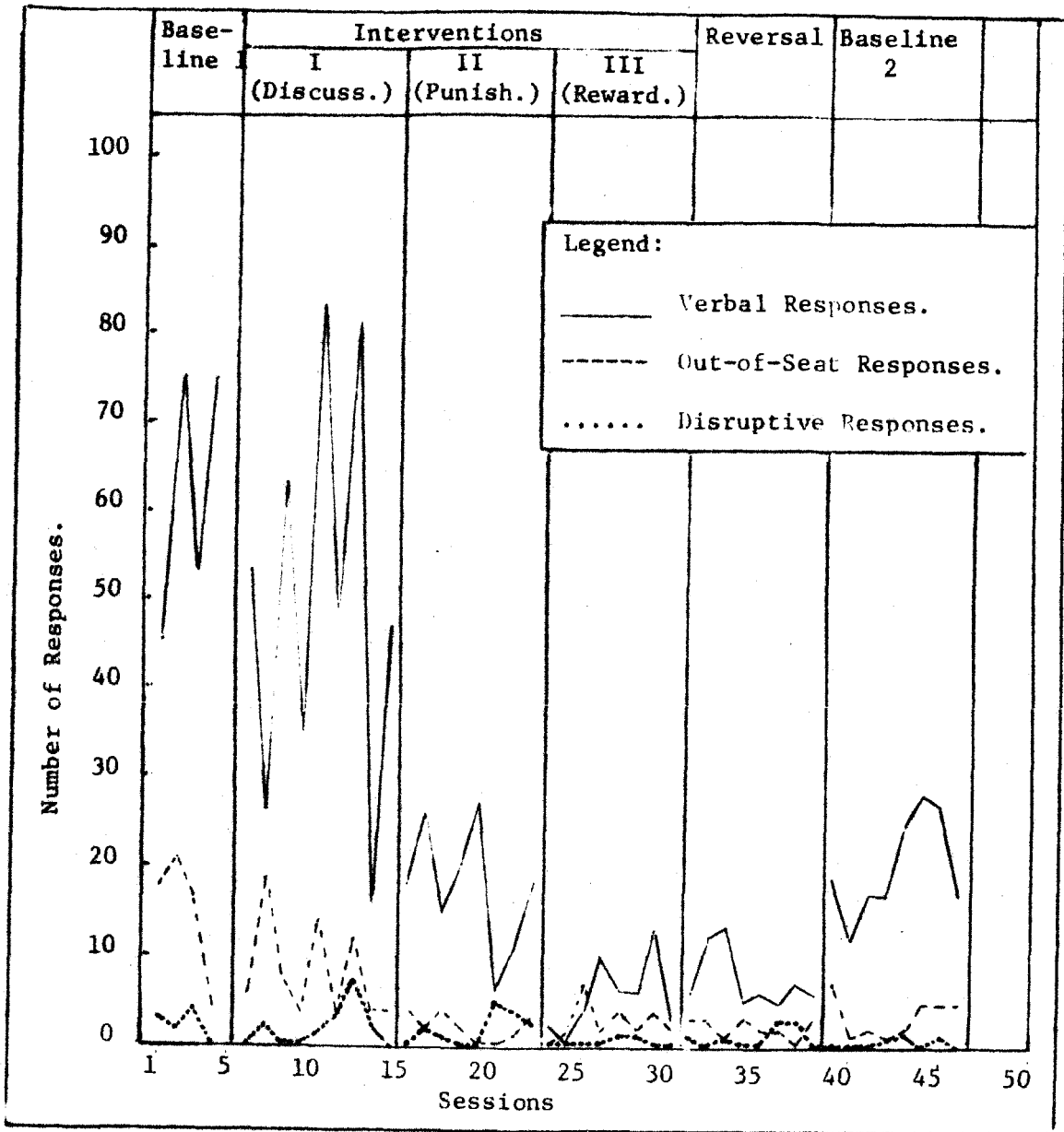


Figure 6. Classes of Target Off-Task Behaviors.



deviations for both the general and the target response categories. The reduction in the mean response frequency for this class was greatest as a result of Intervention II for both categories, and continued to decrease as a result of Interventions II and III. A trend towards an increase in mean frequency of responses was recorded as a result of Reversal. However, the increase was not as great as the decreases recorded for the previous three phases. The increasing trend was more significant as a result of Baseline II.

Out-of-seat response class. Figures 5 and 6 indicate the extent that the out-of-seat response frequencies were affected by the contingency procedures. This class of responses accounted for 19% of all the mean response frequencies recorded for Baseline I. The mean frequencies of responses for the two categories were reduced significantly as a result of Intervention I. The decrease in mean response frequencies was continued for Intervention II. The general off-task mean response frequencies continued to show slight reductions for Intervention II and Reversal, while the target off-task mean response frequencies remained virtually unchanged. Slight increases in the mean response frequencies were recorded for both categories as a result of Baseline II.

Disruptive response class. Figures 5 and 6 show the results of the contingency procedures on the disruptive responses. The mean response frequencies for both categories decreased as a result of Intervention I. The mean frequency of the general response category continued to slightly decrease as a result of Interventions II and III, slightly increased for Reversal and decreased for Baseline II. The mean response frequency of the target response category remained essentially unchanged for Intervention II, decreased for Intervention III, increased for Reversal and again de-

creased for Baseline II.

On- and off-task categories of behavior. The data for the different on- and off-task categories were summarized in Figure 7. This data indicates that, with the exception of Reversal, the percentage of 'hard' on-task behaviors had an increasing trend, while the 'soft' on-task behaviors had a decreasing trend. The percentage of off-task behaviors consistently decreased from the Baseline I frequencies through the Interventions and Reversal phases. A slight increase in percentage frequency was observed for Baseline II. The increases were relatively small, but still significant in view of the relatively high standard of on-task behaviors recorded for Baseline I.

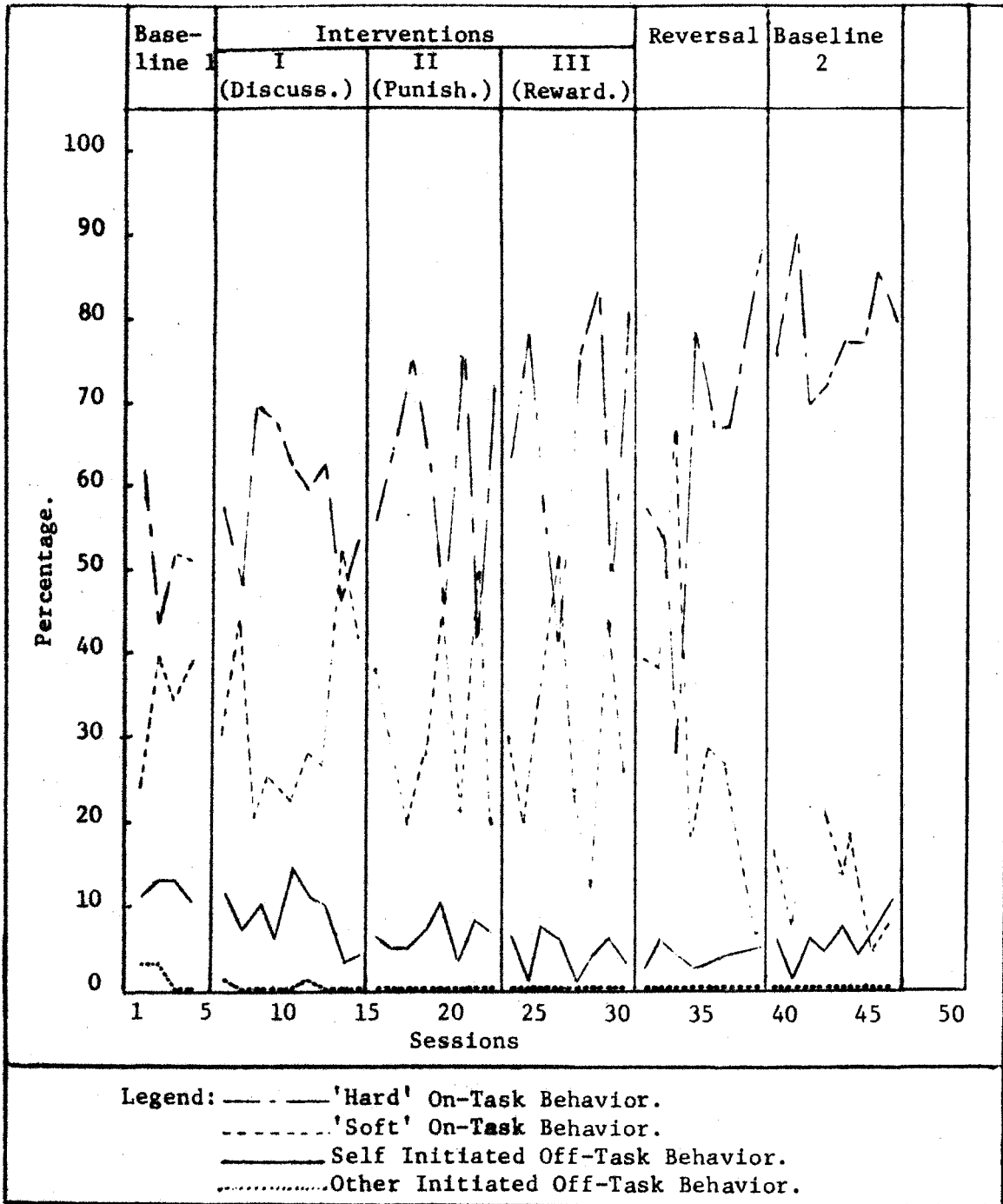
Achievement of The Long-Term Reinforcer

The long-term reinforcer, the elimination of homework for every second session when the predetermined conditions were met, was given as a function of the teacher's observations of the frequencies of the target behaviors. The students as a group were successful in meeting the predetermined conditions in every instance. The range and mean of the target responses for Intervention II were (11 - 26; $M = 18.4$) and for Reversal (3 - 11; $M = 7.6$). The range and mean of the completed time intervals for Intervention III were (11 - 17; $M = 13.6$). Even if the reinforcer had been made available on the basis of the frequencies as recorded by the independent recorder the group would have obtained the reinforcer in every instance.

Summary

Figures 2 through 5 and Table II indicate the extent of the effect

Figure 7. Categories of On-Task and Off-Task Behaviors.



which the contingency procedures had on all the off-task behaviors and the classes of off-task behaviors. Generally, the frequencies of all verbal responses were significantly reduced, in terms of classroom implications, from the Baseline levels for Interventions I, II and III. A reversing trend was recorded for Reversal and Baseline II. The same pattern was noted for the general out-of-seat behavior frequencies, while for the target response category a decrease for this class was noted only for Interventions I and II. The mean response frequencies of the target out-of-seat behaviors remained almost stable for Intervention III and Reversal while a slight increase was recorded for Baseline II.

The pattern of results for the general disruptive behaviors was similar to that of the verbal response class with one exception. There was a decrease in the mean response frequencies from Reversal to Baseline II (Table II). The pattern of results for the target disruptive behaviors was quite varied. The mean response frequency decreased from Baseline I to Intervention I, remained stable for Intervention II and dropped to almost insignificant levels for Intervention III, Reversal and Baseline II. The fluctuations of slight increases and decreases were probably floor effects in that the frequencies were already at low levels and could not be reduced significantly further.

The proportionate levels of the classes of behaviors in terms of a percentage of the total responses were roughly maintained throughout the study (Table III). The verbal response class consistently had the highest percentage of mean frequencies of all phases. The relative frequency levels for each class of general off-task responses were similar only for Intervention III. An unusually large proportionate frequency level was observed for the target out-of-seat behaviors for Intervention III. Other fluctuations were observed but were not as significant.

Table III

Comparison of Mean Responses as Percentages of
the Total Number of Responses For Each Phase.

Phases	Classes of Behavioral Responses					
	General Responses			Target Responses		
	A	B	C	A	B	C
Baseline I	64	19	17	78	19	3
Intervention I	71	17	12	83	13	3
Intervention II	56	19	23	82	10	9
Intervention III	38	26	37	65	32	3
Reversal	46	18	36	68	19	10
Baseline II	72	18	10	83	15	2

Note: A = Verbal off-task responses.

B = Out-of-seat off-task responses.

C = Disruptive off-task responses.

Percentages may not sum to 100 due to rounding.

CHAPTER V

DISCUSSION OF RESULTS

General Observations

The contingency procedures defined and used in this study significantly¹ and reliably modified the class of verbal target behaviors in normal classroom situations. The procedures also modified the classes of out-of-seat and disruptive behaviors but the effects were less pronounced, possibly due to floor effects (see Figure 6). These findings support previous research (Schmidt & Ulrich, 1969; Barrish, Saunders & Wolf, 1969; Medland & Stachnik, 1972) that off-task behaviors can be effectively modified by contingency procedures. Not only were the target response frequencies reduced, but the frequencies of the classes of responses to which the target responses belonged were similarly reduced. These results were similar to those of the study by O'Leary and Drabman (1971) who found that contingencies tended to increase the frequency of the emission of similar appropriate behaviors through a response generalization, even though application of the procedures was made only upon the occurrence of specific appropriate responses. The present study found that such response generalization also held in terms of decreasing the frequency of similar inappropriate behaviors even though the application of the procedures was made only upon the occurrence of the target response classes.

Two comments need to be made about Intervention I. First, when the study was designed, some effects were anticipated to result from the discussion about disruptive behaviors. Specifically, it might have been pre-

1. "Significant" in this discussion is defined in terms of practical rather than statistical application. No statistics were computed for this study.

dicted that a whole-class discussion on behavior problems would make more salient the disruptive influence they had on learning as well as help the students to specify exactly what some of these behaviors were. However, the effects of the discussion were greater than expected. As such, they seem to contradict the findings of Madsen, Becker and Thomas (1968) that rules alone exert little effect on classroom behaviors. A possible explanation might be that the discussion made salient for the students some natural but typical dormant reinforcement or punishment contingencies relevant to reducing disruptive behaviors. However, had the number of sessions following the discussion been greater, it can also be hypothesized that these typically inoperative contingencies may have again become inoperative, resulting in a reinstatement of the "natural" environment prior to the discussion with its increased levels of disruptive behaviors.

Secondly, Bandura (1967) indicated the importance of involving students in selecting the target responses and the contingent event to achieve an effective procedure. However, the discussion itself may have, especially by involving the students in the aforementioned ways, carried over to influence the responses of the students in other phases. This speculation can not be tested by the data collected. To determine more clearly the effects of the discussion, further research needs to be undertaken. This should involve the use of both control and experimental groups to examine if the discussion did in fact set up stimulus control and if the discussion somehow evoked or made operative some "dormant" contingencies which were not observed.

The relative effectiveness of the two short-term contingency procedures was found to be numerically different. However, for practical classroom application, the short-term reinforcement procedures were found to be substantially and significantly more effective only in reducing the verbal

response frequencies. The short-term reinforcement and the short-term punishment procedures were found to be similarly effective in modifying and reducing the other classes of behaviors. Thus, the second hypothesis, in terms of practical classroom application, was shown to hold for the verbal response class, but was not conclusive for the out-of-seat and the disruptive classes. The response frequencies for those two classes were modified differently to some extent, but were already at relatively low levels of emission, and small differences at such low levels would have no significant classroom applications.

Despite the fact that both short-term contingencies were effective in reducing the frequencies of the inappropriate behaviors, informal observations and discussions with the students indicated that the students preferred the short-term reinforcement contingency. As well, the general classroom atmosphere seemed to be more positive, although there is no data to substantiate this claim.

The criterion level for the short-term reinforcement contingency meant that the group as a whole could not engage in any target off-task behaviors for at least twenty of the session's thirty-five minutes. Results showed that the group usually achieved more than the required twenty minutes and, compared to Baseline I data, this was very satisfactory for the teacher.

The percentage of on-task behavior increased relative to the baseline for each of the Intervention phases. No relative differences in effectiveness were determined between the short-term contingency systems. This may have been due to the fact that the long-term reinforcement procedure was in effect during those short-term contingency procedures. Although the increase in terms of percentage points (about 8) appears to be low, it can be considered important in view of the relatively high level of on-task behavior exhibited by the students during Baseline I (86.7%). Thus, the

third hypothesis that the percentage of on-task behavior would increase over the contingency periods was accepted.

The frequency of the off-task responses varied from one session to another within each phase. This seemed to be an indication that usual classroom conditions were present, reflecting the mood of the class and the relative difficulty and interest of the topic dealt with during any specific session. This fluctuation in response frequencies increased significantly for the general as well as the target off-task behaviors as groups, and for the general verbal behaviors and the classes of target verbal and out-of-seat behaviors, as a result of Intervention I. This was reflected by an increase in the standard deviation for the mentioned frequencies. However, for most other classes and categories, the standard deviations decreased as the frequencies decreased and vice versa.

Not all sessions were the same. Some sessions were spent in completing a quiz (sessions 7, 13, and 24). During these sessions, the frequency of all responses was lower compared to most other sessions for the particular phase. However, comparison of quiz sessions which took place during Interventions I and II indicated that the relative effects of the interventions were maintained across such sessions. Similar relative effects were found across sessions which were not of the complete 35-minute time interval. Sessions 3, 21, and 30 were each 30 minutes, while session 35 was only 22½ minutes. Time table interruptions, frequent in all schools, were the cause of these differences. In these instances, the frequencies of the responses did not vary greatly from those for other sessions during the respective phases.

The discussion between the students and the teacher regarding the need for more acceptable classroom behaviors had a significant effect on modifying the frequencies of all behaviors. These results support Bandura's

(1967) identification of the importance of involving the students in contributing both to the general and the target behaviors to be modified, as well as in the selecting of the appropriate reinforcer, in devising an effective procedure. Allowing the students to select the reinforcing event seemed to have ensured that it would be of sufficient strength to significantly and consistently modify the behavior frequencies.

The response frequencies for the Reversal phase did not return to the levels previously recorded during Baseline I and Intervention I. This was presumably due to the appropriate behaviors being established to the extent that these had become somewhat internalized by the students. This is supported by the frequencies of the responses as recorded during Baseline II. The relatively insignificant decrease in the frequency of the target disruptive response class can be explained in that these responses were at an insignificant level, even during Baseline I. However, the maintainance of these low frequencies even after a two-week Christmas holiday is noteworthy.

Research Concerns

Observer discrepancies. The independent observer usually recorded a greater frequency of target off-task behaviors than did the teacher. One reason for this was that the teacher could not observe the behaviors while writing on the blackboard or helping individual students. Despite these discrepancies, the results of this study indicate that it is possible for classroom teachers to act as observers and behavior modifiers to substantially modify the behaviors of the students.

Time sampling procedure. The time sampling procedure as used to determine the percentage of on-task behavior of the students as a group did not accurately reflect the general behavior of the group. Baseline I

data indicated a relatively high percentage of on-task behaviors (Figure 4), while at the same time data indicated a relatively high frequency of off-task behaviors (Figure 2). One reason for this discrepancy is that a few students were responsible for a great number of off-task behaviors while each accounted for less than 5% of the time sampling observations. A better method to record on-task behaviors may be to record the occurrence or non-occurrence of any off-task behavior by any member of the group over smaller time-intervals. On-task behaviors, calculated as the frequency of on-task behavior intervals as a percentage of the total number of intervals, would be a more accurate indication of the on-task behavior of the group as a whole.

Use of stimuli. The same stimulus was used for both short-time contingency procedures. First, a 'point' was used as a punisher, then as a reinforcer and lastly, again as a punisher. This required the students to perceive the different intent of the 'point' as applied in the different contingency procedures and may have influenced its effect. This also may partially account for the relatively minor differences, particularly as a result of the Intervention III and the Reversal. Perhaps the use of two differing stimuli would have resulted in more distinct differences for the two short-term contingencies.

Floor and ceiling effects. There was a lack of significant differences in modifying the frequency of some of the specified off-task behaviors. This was especially the case for the out-of-seat and disruptive behaviors as a result of Intervention III and Reversal. One reason may be a floor effect on these behaviors which already were at a relatively insignificant level. Further decreases in frequency levels may not have been possible (or even desirable) for a group of active students, without aversive side-effects emerging.

A similar but opposite effect was noted for the percentage of on-task behaviors which exhibited ceiling effects. The percentage of on-task behavior was at such a high level for Baseline I that further increases, beyond those observed, may not have been possible.

Conclusion

The results of this study showed that a classroom teacher can effectively and consistently reduce the frequency of off-task responses by applying a short-term punishment and/or a short-term positive reinforcement contingency procedure to particular target responses which are a subset of general classes of behavior inappropriate for learning. Teaching time, i.e., time devoted to academic concerns, also was increased because the teacher did not have to call the students to their tasks during the use of these contingency procedures. The general atmosphere of the classroom remained positive and seemingly more productive. Although no measurements were obtained, the students seemed to have less homework on the non-event days than they had before the study was initiated. Yet, as much, and perhaps more, material was covered by the teacher. Thus, the special event, i.e., elimination of homework on a regular basis, had no observed detrimental effect. On the other hand, the students were always eager to know whether the criterion levels, which entitled them to the contingent event, had been met.

For classroom implications, this study provided teachers with the practical knowledge about the effectiveness of contingency procedures to modify and reduce the frequency of students' off-task behaviors. It showed that a teacher does not need equipment or devices other than those already present in most classrooms to effectively manage the classroom behaviors

of the students. Through the use of similar contingency procedures, teachers can help students to acquire patterns of appropriate behavior which may continue to benefit the students long after the external contingency conditions have been removed. Most important, these procedures provide the teacher with practical and effective techniques so that their technical skills of teaching can be used most productively in assisting students to learn.

Appendix A: Schedule I.

Date: _____ Session # _____

OFF-TASK BEHAVIOR OBSERVATION SHEET

VERBAL RESPONSES:	OUT-OF-SEAT RESPONSES:	DISRUPTIVE RESPONSES:
Talking or whispering to other students:	Out of seat in the area:	Kicking or tripping another student:
Talking or reading audibly to oneself:	Leaning over someone's desk: (in-seat at desk):	Hitting another student:
Making noises:	Leaving the area:	Making noises:
Calling out to other students:	Tipping the chair/desk:	Taking things from another student:
Calling out for the teacher:		Turning around in the desk:
Calling out answers:		

Appendix B: Schedule II.

ON-TASK BEHAVIOR OBSERVATION SHEET

Session # _____

Date: _____

ON - TASK BEHAVIORS:

Hard On-Task:

Uses pencil:																					
Responds appropriately when requested:																					

Soft On-Task:

Appears to be listening to the lesson:																					
Reads the assignment silently:																					
Has completed the assignment:																					

OFF - TASK BEHAVIOR:

Self-initiated:																					
Other-initiated:																					

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