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## The Effects of Praise on Selected Variables in Secondary School Classrooms: A Behavior Modification Approach

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THE EFFECTS OF PRAISE ON SELECTED  
VARIABLES IN SECONDARY SCHOOL CLASSROOMS:  
A BEHAVIOR MODIFICATION APPROACH

by

Robert Earl Hardy

A Dissertation  
Submitted to the  
Faculty of the Graduate  
College in partial fulfillment  
of the  
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Robert Earl Hardy

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THE EFFECTS OF PRAISE ON SELECTED VARIABLES  
IN SECONDARY SCHOOL CLASSROOMS: A BEHAVIOR  
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# TABLE OF CONTENTS

CHAPTER		PAGE
I	THE PROBLEM. . . . .	1
	Introduction. . . . .	1
	The Statement of the Problem. . . .	4
	Definition of Terms . . . . .	7
	Scope of the Study. . . . .	8
	Relevance of the Findings . . . . .	9
II	A REVIEW OF SELECTED AND RELATED LITERATURE . . . . .	10
	Summary . . . . .	26
III	DESIGN AND METHODOLOGY . . . . .	27
	The Sample. . . . .	27
	Procedures. . . . .	27
	Instrumentation . . . . .	32
	Data Analysis . . . . .	33
	Summary . . . . .	34
IV	RESEARCH FINDINGS. . . . .	35
	Restatement of the Problem. . . . .	35
	Reporting the Results . . . . .	36
	Discussion of the Analysis of Variances . . . . .	48
	Discussion of the Correlations. . .	58
	Summary . . . . .	59
V	SUMMARY, DISCUSSION AND RECOMMENDATIONS	61
	Summary . . . . .	61
	Discussion. . . . .	63
	Recommendations . . . . .	64

# LIST OF TABLES

TABLE		PAGE
1	Hand Raising Responses of Students No Praise, Praise, No Praise Conditions Teacher One . . . . .	37
2	Hand Raising Responses of Students No Praise, Praise, No Praise Conditions Teacher Two . . . . .	38
3	Hand Raising Responses of Students No Praise, Praise, No Praise Conditions Teacher Three . . . . .	38
4	Means and Standard Deviations Hand Raising Responses of Students No Praise, Praise, No Praise Conditions Teacher Three . . . . .	39
5	Pair-Wise Comparisons Hand Raising Responses of Students No Praise, Praise, No Praise Conditions Teacher Three . . . . .	39
6	Hand Raising Responses of Students No Praise, Praise, No Praise Conditions .	40
7	Verbal Responses of Students No Praise, Praise, No Praise Conditions Teacher One . . . . .	41
8	Verbal Responses of Students No Praise, Praise, No Praise Conditions Teacher Two . . . . .	42
9	Verbal Responses of Students No Praise, Praise, No Praise Conditions Teacher Three . . . . .	42
10	Verbal Responses of Students No Praise, Praise, No Praise Conditions .	43
11	Verbal Responses of Students No Praise, Praise, No Praise Conditions Teacher One . . . . .	44



LIST OF TABLES  
(continued)

TABLE	PAGE
12      Verbal Responses of Students No Praise, Praise, No Praise Conditions Teacher Two . . . . .	44
13      Verbal Responses of Students No Praise, Praise, No Praise Conditions Teacher Three . . . . .	45
14      Teacher Image No Praise, Praise, No Praise Conditions .	45
15      Student Study Habits No Praise, Praise, No Praise Conditions Teacher One . . . . .	46
16      Student Study Habits No Praise, Praise, No Praise Conditions Teacher Two . . . . .	47
17      Student Study Habits No Praise, Praise, No Praise Conditions Teacher Three . . . . .	47
18      Student Study Habits No Praise, Praise, No Praise Conditions .	48
19      Correlations: Student Verbal Responses and Teacher Image . . . . .	50
20      Correlations: Student Verbal Responses and Teacher Image, Teacher One. . . . .	50
21      Correlations: Student Verbal Responses and Teacher Image, Teacher Two. . . . .	51
22      Correlations: Student Verbal Responses and Teacher Image, Teacher Three. . . . .	51
23      Correlations: Student Verbal Responses and Student Study Habits. . . . .	52
24      Correlations: Student Verbal Responses and Study Habits, Teacher One . . . . .	52

LIST OF TABLES  
(continued)

TABLE		PAGE
25	Correlations: Student Verbal Responses and Study Habits, Teacher Two . . . . .	53
26	Correlations: Student Verbal Responses and Study Habits, Teacher Three . . . . .	53
27	Correlations: Student Hand Raising Responses and Teacher Image . . . . .	54
28	Correlations: Student Hand Raising Responses and Teacher Image Teacher One . . . . .	55
29	Correlations: Student Hand Raising Responses and Teacher Image Teacher Two . . . . .	55
30	Correlations: Student Hand Raising Responses and Teacher Image Teacher Three . . . . .	56
31	Correlations: Student Hand Raising Responses and Study Habits. . . . .	56
32	Correlations: Student Hand Raising Responses and Study Habits Teacher One . . . . .	57
33	Correlations: Student Hand Raising Responses and Study Habits Teacher Two . . . . .	57
34	Correlations: Student Hand Raising Responses and Study Habits Teacher Three . . . . .	58

## CHAPTER I

### THE PROBLEM

#### Introduction

In American psychology there are three major approaches to the understanding and modifying of behavior. One approach is the "behavioral"; other terms that are associated with this approach are "behavioral modification," "experimental," "objective," "laboratory." A second approach to understanding and modifying behavior is the "Freudian," which includes "dynamic psychology," "ego-psychology," or "psychoanalysis." The third approach to behavior is the "phenomenological," with such terms as "self-theory," "being and becoming," "existential," being used to identify this approach to behavior (Rogers, 1964).

The Freudian approach assumes that man is controlled by "inner forces," and the process of behavioral change and/or modification centers on the therapist helping the client with unresolved conflicts. Although the Freudian approach has had vast appeal, attempts to research this approach have produced results that are highly subjective and questionable. Concepts such as reaction formation, death wish, id, etc., are not amenable to empirical investigation (King, 1965).

The phenomenological approach assumes that behavior is the result of an individual's field of perception; the person's perceptual field is his "reality." Perception is

a function of the physical organism; perception takes time; perception requires sufficient exposure (concrete and/or symbolic); perception is a function of each individual's goals and values; the self concept of the perceiver effects perception; and, perception is influenced by threat (Combs, 1954). The literature of phenomenological counseling has reported positive counseling outcomes (Combs and Soper, 1963; Rogers, 1957; Rogers, 1962).

Within the behavioral approach to behavior are two major schools of thought -- the respondent or reflexive conditioning viewpoint, and the operant viewpoint. The respondent conditioning approach grew out of the work of Ivan Pavlov and the operant approach is based on the work of B. F. Skinner. Bigge and Hunt (1962) contrasted the two viewpoints:

Reflexive learning involves such situations as are described in the Pavlovian dog studies. Essentially it is a process of stimulus substitution. An organism supposedly responds reflexively to a natural or unconditioned stimulus. A new stimulus is presented along with the original stimulus and the organism comes to respond to the new stimulus in the same way it formerly did to the original one. The new stimulus becomes a conditioned stimulus; the organism has learned. In reflexive or respondent conditioning the key stimulus is the one which precedes the response. Whereas reflexive learning is an S-R process, operant learning is an R-S process.

In operant learning, the significant stimulus is that which immediately follows the response. Any modification of the environment is a stimulus. Operant behavior is that behavior which operates upon the environment to generate consequences. Notice that in this process not the person or the environment but it-behavior-behaves; behavior is a phenomenon of nature. Just as wind blows, behavior behaves (p. 362).

The behavioral literature has reported concise research findings ranging from training pigeons to perform behavior such as guiding a missile (Skinner, 1960), to changing undesirable behavior in mentally retarded and psychotic individuals (Ayllon and Michael, 1959). Research has demonstrated that students when reinforced for information-seeking, decision-making, and deliberation-making behaviors generalize these behaviors outside of the counseling situation (Krumboltz and Schroeder, 1955; Krumboltz and Thoresen, 1964; Ryan and Krumboltz, 1964). Reinforcement for verbal behavior in small groups outside the classroom has been shown to increase verbal participation in the classroom (Johnson, 1963).

One of the key procedures used by operant technologists (behavioral engineers, behavioral modifiers, behavioral scientist, etc.) to modify and control behavior is the application of appropriate reinforcement for desired behaviors (Skinner, 1938). This procedure has engendered a vast amount of research on both animals and human subjects. Basic to the research is the application of these selected learning principles to a single organism (Walker, 1967). In addition to single organism designs, operant research focuses on observable behavior immediately connected with pre and post-reinforcement conditions (Michael and Meyerson, 1962).

## The Statement of the Problem

The approach of operant technology involving concentration on modifying and controlling the behavior of single organisms and focusing on direct measures of behavior may have resulted in the neglect of a number of meaningful variables. Variables that have been neglected by the operant approach are the inner experiences of human beings such as inner meanings and purposes (Rogers, 1964).

The behaviorists emphasize single organism research; yet, theoretically, within our culture there are reinforcers that a majority of people find reinforcing and which could be applied in a group setting. One such reinforcer is praise (Kruboltz, 1966; Michael and Meyerson, 1962). Kruboltz, Michael and Meyerson, concluded that praise is reinforcing to a majority of people because praise has been found to be experimently effective as an independent variable in a vast amount of research (e.g. Staats, 1965; Bijou, 1965; Salzinger, et al, 1965; Becker, Thomas, and Carnine, 1969).

Although the behaviorists focus on direct measures of behavior, writers and researchers maintain that factors other than direct measures of behavior are significant in helping people behave more effectively (Traux and Carkhuff (1967) accurate empathy, non-possessive warmth, and genuiness; Rogers (1951) self-concept; Frankl (1959) values and meaning; Combs (1954) perception; and Ellis (1962) rational thinking).

Because of the limited scope of the behaviorists in researching behavior, three basic questions have not been answered.

1. What effect does operant technology have upon individuals in a group setting regarding variables that are directly measurable?
2. What effect does operant technology have upon behavior in a group setting that is indirectly measurable?

Of major significance is a question that has not been approached in the literature:

3. What is the relationship between indirect measures of behavior and direct measures of behavior?

The present study was designed to answer these questions. Specifically, what effect will reinforcing individuals in a classroom setting have upon the students' number of voluntary hand raising responses, number of voluntary verbal responses, perceptions of the teacher and study habits? In addition, the relationship between the indirect measures of behavior (teacher image and study habits) and direct measures of behavior (student hand raising responses and student verbal responses) were analyzed.

The following eight hypotheses were tested in the research. The first two hypotheses tested direct measures of behavior (question one); the next two hypotheses tested indirect measures of behavior (question two); and, the last four hypotheses tested the relationship between indirect and direct measures of behavior (question three).

- H<sub>i</sub>1: Student hand raising responses will show a significant increase in the experimental period of the research in comparison to the baseline and extinction periods of the research.
- H<sub>i</sub>2: Student verbal responses will show a significant increase in the experimental period of the research in comparison to the baseline and extinction periods of the research.
- H<sub>i</sub>3: Teacher image will show a significant positive increase in the experimental period of the research in comparison to the baseline and extinction periods of the research.
- H<sub>i</sub>4: The study habits of the students will show a significant positive increase in the experimental period of the research in comparison to the baseline and extinction periods of the research.
- H<sub>i</sub>5: Verbal responses and teacher image will demonstrate higher correlations in the experimental period of the research than in the baseline and extinction periods of the research.
- H<sub>i</sub>6: Verbal responses and study habits will reveal higher correlations in the experimental period of the research than in the baseline and extinction periods of the research.
- H<sub>i</sub>7: Student hand raising responses and teacher image will demonstrate higher correlations in the experimental period of the research than in the baseline and extinction periods of the research.
- H<sub>i</sub>8: Student hand raising responses and study habits will reveal higher correlations in the experimental period of the research than in the baseline and extinction periods of the research.

In conjunction with the specifically stated hypotheses, the study was designed to contribute to theory building and to the application of operant technology in the educational environment. Theory building and the increased application of operant technology can be accomplished by expanding the



principles of operant technology beyond single organism research and research on direct measures of behavior, and by analyzing the common factor variance between direct and indirect measures of behavior. The need to expand the concepts of operant technology is made apparent by Varenhorst (1969).

Praise was selected as an independent variable because it has been identified as a reinforcer that theoretically the majority of people find reinforcing. The dependent variables of verbal responses and participation responses were selected because of their important to the education process (Calder and Antan, 1970) and they offer direct measures of classroom behavior. The literature supports the importance of teacher image (Bryan, 1963; Bryan, 1966; and Bryan, 1968), and its selection as a dependent variable provided an indirect measure of behavior. The importance of good study habits for students is reported in the literature (Strang, 1968; Armstrong, 1967), and this dependent variable provided another indirect measure of behavior.

#### Definition of Terms

Following are the definitions of terms germane to the study:

**Praise:** any statement that makes a positive evaluation of an object, person, act, or event, and that contains very little supplementary information (Farson, 1966).

Teacher Image: Scores received on the Western Michigan University Teacher Image Questionnaire.

Study Habits: Scores received on the Brown-Holtzman Survey of Study Habits and Attitudes.

Verbal Response: The act of talking on a voluntary basis.

Participation Response: The act of hand raising on a voluntary basis.

### Scope of the Study

Following an introduction, the purposes of the study were outlined, then relevant definitions were given. Below a brief overview of the study is given.

Thirty-six high school students were assigned by the process of computer class scheduling to one of three psychology classes taught by three different teachers. During the first two weeks of the study, no verbal praise was given by the teacher. At the end of these two weeks, the students were tested for study habits using the Brown-Holtzman Survey of Study Habits and Attitudes, and their perceptions of the teacher using the Western Michigan University Teacher Image Questionnaire. The following two weeks consisted of the teacher giving verbal praise to the students, and once again the students were tested. After this section of the research, the first two week procedures were once again initiated into the study. For the entire experiment, trained raters were in the classrooms to record the hand raising responses and verbal responses of the students; also, the praise responses given by each teacher were recorded by the raters.

## Relevance of the Findings

Results of the study pointed to new dimensions in reinforcement research. Instead of being confined to single organism research and research on direct measures of behavior, new information exploring the effects of group reinforcement and the effects of reinforcement upon variables that were not being directly measured were added to the literature.

The literature reported research on direct measures of behavior and research on indirect measures of behavior. The assumption has been built in that the two approaches to research are totally different. This study was an attempt to aid in the development of theory building to bridge the gap between indirect measures of behavior and direct measures of behavior.

In addition to the over-all theoretical considerations of the study, new knowledge regarding the effects of praise upon study habits, teacher image, voluntary student verbal responses, and voluntary student hand raising responses were added to the literature.

## CHAPTER II

### A REVIEW OF SELECTED AND RELATED LITERATURE

The literature of behavior modification in classrooms was reported in three general areas -- pre-school (nursery), special classrooms, and normal classrooms. Since special and normal classrooms overlap, definitions of the two types of classrooms were needed. Hanley's (1970) definitions were acceptable:

Normal Classroom: Is a setting in which there is usually one teacher who has not received special training for any specific population of children. The size of these classes usually ranges from 15 to 40 students who have not been diagnosed as having special problems. It is highly probable, however, that normal classrooms contain some students who exhibit the same behavior characteristic of some of the categories relevant to the special classroom. Thus, the normal classroom, in general, may be defined as any school class in which the teacher or the students have not been selected on the basis of a specific diagnostic category (p. 599).

Special Classroom: Any classroom to which students have been assigned on the basis of one of the following diagnostic categories: retarded, autistic, emotional problems, severe behavior problem, juvenile delinquent, learning disability, low achievement. Usually these classrooms contain only 5 to 10 students each. Teachers of this type of classroom have had some advanced training relevant to these special populations. Many times the teacher has at least one aide to assist her. In general, these classrooms are labeled "special" because they contain students who have been singled out from the rest of the school population as being different enough

to need special attention. The special classroom setting is usually a self-contained unit functioning under a different daily schedule than the normal classroom (p. 599).

Depending on the type of students, the pre-school classroom could fit either definition.

Bushell, Wrobel, and Michaelis (1968) used tokens (combined with encouragement) to increase the study behaviors of a pre-school class. Buell, Stoddard, Harris, and Baer (1968) used social reinforcement (teacher approval) with a three year old pre-school girl to increase her use of outdoor play equipment and to increase her social contact with children. In addition, one of her inappropriate behaviors (baby behavior -- baby talk, hand flapping, incomplete sentences, etc.) was markedly reduced. Harris, Wolf, and Baer (1964) used social reinforcement (adult attention) to increase the "vigorous play activity" of a pre-school boy. Also, the social reinforcement was used to help the boy overcome "isolate play," and extinction (ignoring the behavior) significantly decreased the boy's crying behavior. Harris, Johnson, Kelley, and Wolf (1964) used approval to increase the "on feet" behavior of a pre-school child. Allen, Harris, Henke, Baer, and Reynolds (1967) used social reinforcement (adult attention) to increase the attention span of a four and one-half year old boy. Hart and Risley (1968) worked with disadvantaged pre-school children and structured the environment by requiring the students to ask the teacher for

materials in correct color noun combinations before they were given. Correct responses were praised and a significant increase in the use of color noun combinations was found. After the contingencies were removed, the behavior continued to some degree. Hart, Reynolds, Baer, Brawley, and Harris (1968) used social reinforcement (teacher attention) to increase the cooperative play of a five year old pre-school girl. Additional research in a pre-school setting was reported by Allen, Buell, Wolf, and Harris (1964). They used a positive reinforcer (teacher attention) to markedly increase social interaction of a pre-school girl. Homme, de Baca, Devine, Steinhorst, and Rickert (1963) first used high priority behaviors (children enjoyed running, screaming, pushing chairs) as reinforcers for desired behaviors, then they allowed the children to earn tokens to "buy" high priority behaviors. The high priority procedure resulted in excellent classroom control of the children. Finally, Scott, Burton, and Yarrow (1967) used social reinforcement (adult approval) to significantly increase the appropriate behavior of a four year old boy towards his peers.

The research in special classrooms was reported on a variety of different types of students. Osborne (1969) worked with six subjects in a special classroom for poor achievement in a school for the deaf, and a significant reduction was reported in "out of seat" behavior when time free from school work was granted contingent upon remaining

seated in the classroom. Wolf, Giles, and Hall (1968) used elementary students in a remedial education program with tokens (S & H Green Stamps) which could be traded in for various items depending on their exchange value. Tokens were given for appropriate behaviors. There was a control group of students who went to regular school and who did not participate in a remedial program. Significant gains were reported for the experimental group on achievement test (Stanford Achievement Test) scores and report card grades when compared with the control group.

Wasik, Senn, Welch, and Cooper (1969) studied two second grade girls in a demonstration school for culturally deprived children. Social reinforcement (attention, praise, and approval) was given for appropriate classroom behavior, and social reinforcement was withheld for inappropriate classroom behavior; a reversal technique (no reinforcement) increased and level of inappropriate classroom behavior, and reinstating the reinforcement, desirable classroom behavior once again increased. In addition, Madsen (1971) used music as a contingent reinforcer with disadvantaged children to teach reading skills and to improve the pronunciation of final consonant sounds.

Research was reported on autistic (schizophrenic) students in special classroom settings. Wolf, Rosley, Johnston, Harris, and Allen (1967) studied a four year old autistic boy in a nursery school setting. Tantrums, sleeping and

eating problems, the refusal to wear glasses, and verbal and social behavior were modified through behavior modification principles. After three years of intensive application of operant behavior modification techniques, the child, who had been considered "hopeless," had made a successful adjustment in a public school special education placement. Hudson and DeMyer (1968) used a positive reinforcer (food) to increase the use of art and craft media with nine young (three to seven years old) schizophrenic and autistic children. Martin, England, Kaprowy, Kilgour, and Pilek (1968) placed ten students in a classroom of autistic children on a token (poker chips) system. Temper tantrums were eliminated, and appropriate classroom behaviors were increased. Rabb and Hewett (1967) studied a small group (four to six) of children who were diagnosed as "autistic, atypical, schizophrenic, minimally neurologically impaired and with severe primary behavior disorders" (p. 313). The students were placed in a special classroom under a token reinforcement system. Task oriented attention increased for two of the children. The writers also concluded that a successful learning program for this type of child with one teacher can be conducted with a token reinforcement system.

Hotchkiss (1966) used a generalized reinforcer (money) in a classroom of educationally handicapped children. The class was given a penny if no inappropriate behavior



occurred during a time interval; the money was distributed among the students. A control group was also used and the following were his conclusions:

- (1) The use of operant conditioning techniques can reduce the occurrence of maladaptive behavior in a classroom for disturbed children.
- (2) Maladaptive behavior of individual children can be defined, observed and specifically extinguished within the framework of normal classroom procedures.
- (3) Improved behavior in the classroom situation generalizes to other school situations such as playground, bus, etc.
- (4) As maladaptive behavior decreases academic progress has a chance to increase.
- (5) A classroom teacher can effectively apply operant conditioning techniques in shaping behavior in the course of her daily teaching.
- (6) It appears unnecessary to refer to any underlying causes in order to decrease maladaptive behavior.
- (7) The shaping out of maladaptive behavior does not result in the emergence of new symptoms; rather, the opposite appears to take place.
- (8) Regardless of the home environment, deviant behavior in the school environment can be reduced by the classroom teacher (p. 4130A).

In a special classroom adjustment room the extinction of classroom tantrums in a student was reported by Carlson, Arnold, Becker, and Madsen (1968). Negative reinforcement

(holding the child in a chair and removing his chair to the back of the room) was used. Also, peer attention was withdrawn from the tantrum behavior of the student by reinforcing the peers (candy) when they did not turn around to observe the temper tantrums, and the student was reinforced for non-tantrum behavior (stars). Attention span and academic interest were increased in a twelve year old in a classroom of emotionally disturbed children by using tokens and approval (Dyer, 1968). In the same type of classroom setting, social reinforcers (praise and smiling) increased appropriate spelling responses of a student; ignoring tantrum behavior and praising appropriate behavior improved the classroom behavior of a second student (Zimmerman and Zimmerman, 1962).

Walker and Buckley (1968) studied one nine year old student in an experimental class for behaviorally disordered children. The student was placed on a token system (points) which significantly increased his attending behaviors.

Birnbrauer, Bijou, Wolf, and Kidder (1965) used a programmed learning classroom with educable retarded children in primary grades; reading, cursive writing, and arithmetic were taught. Disruptive behavior markedly decreased; students studied independently for longer periods of time and did more school work. Mildly retarded adolescent boys (I.Q. over 50) in a residential training program (school and workshop) were reinforced for appropriate behavior with tokens. A significant increase in appropriate behavior was

recorded with the use of tokens. In a second experiment involving the loss of tokens for antisocial behavior, some control over these behaviors was reported, but some overlap between the experimental and control phases of the research indicated that other variables were contaminating the desired responses (Burchard, 1967). A nine year old retarded girl's vomiting behavior in class was eliminated by the use of extinction (not allowing the girl to leave class for a dormitory) and reinforcement (M & M's and praise) (Wolf, Birnbrauer, Williams, and Lawler, 1965). Fourteen educable mentally retarded children who were displaying inappropriate classroom behavior (the "naughty finger") in a primary level classroom were placed under a group contingency; anytime the behavior occurred the class lost one minute of recess. The behavior was significantly reduced (Sulzbacher and Houser, 1968). Birnbrauer and Lawler (1964) used reinforcement (tokens, candy, and adult approval) with severely retarded children to significantly increase social behavior and study behavior. Inappropriate classroom behavior was significantly reduced. Zimmerman, Zimmerman, and Russell (1969) used behavior modification principles on a group basis with seven retarded students, ages eight to fifteen years. Instruction following behavior was selected as the dependent variable; a combination of tokens and praise were used as the independent variables; the reinforcement was effective.

Hall and Broden (1967) studied three children in an experimental school for brain-injured children. Social reinforcement was given by both parents and teachers. Subject one significantly increased in manipulative activities (drawing, writing, coloring, working with puzzles); subject two significantly increased in climbing behaviors (measurements were taken on a climbing tower); subject three showed a significant increase in social play (cooperative and parallel). Patterson, Jones, Whittier, and Wright (1965) used reinforcement (candy and pennies) to significantly reduce the number of nonattending behaviors in a brain-injured hyperactive boy.

Quay, Sprague, Werry, and McQueen (1967) studied the visual orientation towards the teacher of five hyperactive, aggressive children. Reinforcement (a light flash on a small box followed by candy and/or social reinforcement) significantly increased the mean number of visual orientation responses.

Martin, Burkholder, Rosenthal, Tharp, and Thorne (1968) worked with extreme adolescent deviates with the goal of the program to return these adolescents to public schools with behaviors adequate to meet the academic and social demands; a phase reinforcement system was used. The writers also worked with the parents on behavior modification principles to be used with students. The results revealed the phase system was accepted by the students and their parents. A

significant reduction of disruptive behaviors (spitting, obscene gestures, cursing) was reported. All the students advanced in the phase system, and an increase in school work was produced. Follow-up revealed that four of the five students were maintaining adequate adjustments in regular schools (one student dropped out with his parent's permission).

Tyler (1967) used a token reinforcement system with a sixteen year old delinquent boy; the tokens were contingent upon school work. Improvement in the student's quarterly grades was reported. Meichenbaum, Bowers, and Ross (1968) studied institutionalized female adolescent offenders (ten girls); they were unmanageable in homes, foster placements, and traditional institutional settings. The incidence of inappropriate classroom behavior was high (baseline). Money was used to reinforce appropriate classroom behavior. Also, a control group was used of twelve non-institutionalized girls from a neighboring community. A significant increase in appropriate classroom behaviors was reported for the treatment conditions (reinforcement), and the institutionalized girls' appropriate classroom behaviors was not significantly different from the control group in the treatment sections of the research.

Clark, Lachowicz, and Wolf (1968) used a token reinforcement system with five female school dropouts in a remedial classroom setting. The tokens were rewarded for work on remedial workbook assignments over a two month period.

Significant gains in achievement test scores were reported. A control group did not report such gains on the achievement test scores (the total achievement battery median increases for the token group was 1.3 years, for the control group the increase was 0.2 years).

A substantial amount of research using behavior modification principles in public schools at the elementary level was reported. Barrish, Saunders, and Wolf (1969) used a group contingency (peer pressure) to reduce out of seat and talking out behaviors with a fourth grade class. Hall, Lund, and Jackson (1968) increased study behaviors in elementary students by using social reinforcement (teacher attention). Thomas, Becker, and Armstrong (1968) reported that teacher approval (praise, smiles, contacts, etc.) was instrumental in maintaining appropriate classroom behaviors. Classroom disruptive behaviors increased each time the teacher withdrew teacher approving behaviors. Lovitt, Guppy, and Blattner (1969) studied a fourth grade class of thirty-two who were placed under two contingency conditions -- free time (individually arranged) and a group contingency of listening to the radio dependent upon the students' performance on spelling tests. Under these conditions, the majority of the students increased their spelling test performance. Smith and Sanders (1968) placed first graders on a token reinforcement system for appropriate behaviors, and the teacher used "kind words." Appropriate classroom behaviors increased, and inappropriate classroom behaviors were modified.

Hall, Panyan, Rabon, and Broden (1968) studied three beginning teachers with problems of classroom control who were inexperienced with behavior modification principles. By applying various reinforcers (teacher attention, a classroom game, reducing the time of between period breaks), the teachers were able to significantly increase the study behaviors of the students in their classrooms.

Ward and Baker (1968) studied a class of first graders and reported that teacher reinforcement (attention and praise) reduced inappropriate classroom behaviors. No adverse personality changes were revealed (psychological tests) in the subjects after treatment. Further, no significant increase was noted in the other pupils' inappropriate behaviors although teacher attention was slightly decreased to them (attention was focused on the target behaviors of the four subjects under consideration).

The Kalamazoo Valley Intermediate School District publishes a journal called Salt, under the editorship of Robert P. Hawkins. This journal reported a number of successful applications of behavior modification to the public school setting. Nieuwkoop (1968) used reinforcement (candy and praise) to eliminate the prompting behavior of a second grade student; Balduf (1968) used reinforcement (ten more minutes of afternoon recess) to eliminate the inappropriate hand raising behavior in a second grade class; Vogelheim (1968) used positive social reinforcement (praise)

to decrease the amount of time students entered the classroom and were ready to work (third grade classroom) Wright and Hawkins (1970) eliminated the tattling behavior of a second grade boy with extinction; Vogelheim (1970) significantly reduced poor posture in a third grade student by using social reinforcement (praise); and Waber (1971) used tokens to eliminate the thumbsucking behavior of a third grade student.

Surratt, Ulrich, and Hawkins (1969) used a fifth grade student (as a behavioral engineer) to modify the non-study behaviors of four first grade students. The fifth grade student operated a console designed to monitor the study behaviors of the subjects (lights on the subjects' desk provided an opportunity for reinforcement). Increased study behaviors were recorded in the experiment sections of the research. Follow-up observations, using closed circuit TV, indicated the study behaviors of the subjects were partially maintained.

Schmidt and Ulrich (1969) used reinforcement (two minutes of addition gym and two minutes of class break) for a designated quiet period that was recorded on a decibal meter. The reinforcement significantly reduced the sound-intensity of the classroom (peer pressure was observed being used against the noisy members of the class). In a second part of the research, gym time could be lost or gained depending on appropriate behavior; classroom sound level and



and out of seat behaviors were significantly reduced (fourth graders).

To study disruptive classroom behavior O'Leary, Becker, Evans, and Saudargas (1969) used a number of approaches -- classroom rules (appropriate behaviors that were reviewed daily), educational structure (designing the academic program into 30-minute sessions), teacher praise and ignoring inappropriate behavior, and a token reinforcement system. The results showed that rules, educational structure, praise and ignoring inappropriate behaviors did not produce any consistent effects on the childrens' classroom behaviors. The token reinforcement approach created a marked reduction of inappropriate behaviors. Reversal of the token system (withdrawal) significantly increased disruptive behaviors; reinstatement of the token system, once again, created a significant decline in inappropriate classroom behaviors. In a similar study with somewhat different results, Madsen, Becker, and Thomas (1968) used the following design: baseline, rules, rules plus ignoring deviant behaviors, rules plus ignoring plus praise for appropriate behaviors, return to baseline, and finally reinstatement of rules, ignoring and praise. The results indicated that rules had very little effect on improving appropriate classroom behaviors; the effectiveness of ignoring inappropriate behavior was not clear; the combination of ignoring and praising was very successful; praise for appropriate behaviors was probably the most effective independent variable.

Patterson (1965) studied a second grade, hyperactive boy. A box that flashed on a light was used; then reinforcement (candy or a penny) was given. The reinforcement was contingent upon appropriate behavior. Peer reinforcement was built into the study; the class helped the boy earn reinforcement by ignoring his behavior when he was not "working." The rewards earned by the boy were dispersed among the total class. A significant decrease in hyperactive behavior was reported.

Evans and Oswalt (1968) used positive reinforcement (story period and early dismissal from class) given to the class if the students selected for the study were able to correctly answer the teacher's questions based on classroom materials. Since the students determined the reinforcement for the entire class, peer approval as a reinforcer was built into the experimental design. The subjects weekly test scores increased significantly when compared with the test scores of the control subjects (the remainder of the students in the fourth grade classroom).

Patterson (1965) studied a seven year old boy with a school phobia (first grader). In a clinic setting M & M's and social reinforcers were used first to build up the boy's ability to separate himself physically from his mother, then to build up appropriate school behaviors (the parents also were instructed to reinforce appropriate behaviors). Results, "at the cost of twenty bags of M & M's

and ten hours of staff time, Karl returned to school" (p. 283).

Finally, Wood (1968) established an in-service training course for elementary teachers based on behavior modification, and a number of successful classroom projects using principles of behavior modification were reported.

Edwards (1969) reviewed the applied operant conditioning research done at the junior high school level and found no studies done in this area, thereby demonstrating a need for research in this area. He used seventh grade science students as the subjects. The students were placed in one of three groups -- token reinforcement from the teacher, token reinforcement from the teacher plus social reinforcement from a select group of peers, and a control group. The results indicated that both experimental groups were effective in reducing the rate of disruptive responding and in increasing the rate of appropriate responding.

McAllister, Stachowiak, Baer, and Conderman (1969) conducted research that directly related to the present study. Using fifty-one secondary school students (twenty-five in the experimental group and twenty-six in the control group), the writers studied two target behaviors -- inappropriate talking and inappropriate turning around. A combination of praise and disapproval (teacher) were used as the independent variables. The target behaviors were significantly reduced in the experimental group; the control group

did not experience such changes in the target behaviors. The writers of this study state that prior to their research there had been no systematic research with behavior modification principles in secondary school classrooms. In a later study, Nesselroad (1970) used points which could be added to the grades of the students as reinforcers in a high school class of twelve students. The points increased the study behaviors of the students.

### Summary

A review of the literature on behavior modification in pre-school setting, special classrooms, and regular classrooms has been presented. The major concentration of the research has been in pre-school setting, special classrooms, and elementary school classrooms. Only one study was reported in a junior high school classroom, and two studies were reported in high school classrooms.

In relation to pre-school setting, special classrooms, and elementary school classrooms, the use of behavior modification principles was effective in reducing inappropriate classroom behaviors and increasing appropriate classroom behaviors on an individual basis. The need for research in junior high school classrooms and in high school classrooms is evident.

## CHAPTER III

### DESIGN AND METHODOLOGY

Chapter three reports the design and methodology under the following four headings: (1) The Sample, (2) Procedures, (3) Instrumentation, and (4) Data Analysis.

#### The Sample

Thirty-six secondary school students served as the subjects. The students were placed in one of three psychology courses by the process of computer class scheduling. Since the courses had not been tracked, various academic levels were represented. The sample was part of a nine-hundred and eighty-five high school student population.

#### Procedures

The three psychology courses were taught by three different teachers, each of whom met the minimum requirements for teaching high school psychology courses as established by the North Central Accrediting Association.

For each of the three classrooms, a trained rater kept count of the number of voluntary student verbal responses and the number of voluntary hand raising responses. Each rating was plotted on class seating charts so that the responses could be analyzed on an individual basis.

Also, each rater recorded the number of praise responses given by the teacher.

Both teachers and raters were trained by the writer. The writer had individual contacts with each teacher and the following was given to each teacher and discussed:

1. When the rater enters the classroom at the start of the experiment, the class will be told by the classroom teacher that the rater is in the classroom to provide feedback for the teacher to improve his teaching effectiveness.
2. During each experimental section of the research, each teacher will verbally praise his or her class two times each day during the first half hour of the class period. Once every other day praise will be given regarding the students' study habits. Aside from the structured praise, each teacher will praise the students at every opportunity.
3. The students will have a minimum of twenty minutes in each of the class periods to respond verbally in the classroom.
4. The classroom assignments for each two week section will be standardized to the highest degree possible.

After the above was understood by each teacher, the following was passed out and discussed:

Praise: any statement that makes a positive evaluation of an object, person, act, or event, and that contains very little supplementary information (Farson, 1966).

Examples of praise are as follows:

1. "This class has excellent study habits."
2. "I find teaching this class very stimulating."
3. "John, that was a very good answer."
4. "Mary, you are a good student."
5. "David, you show a lot of interest in class."
6. "Excellent answer!"
7. "That's a wonderful suggestion."
8. "That's a terrific idea!"
9. "Very fine answer."
10. "Good for you!"
11. "Nice work, you've done a fine job."

Once the teachers comprehended their expected behaviors and the meaning of praise in individual sessions, a group meeting was arranged. At the group meeting the research expectations were discussed and a tape<sup>1</sup> was played. The tape was seven minutes long and contained one verbal praise response given by a teacher in a classroom situation. The number of verbal praise responses were not known to the teachers; the teachers were asked to record each verbal response from the teacher that they heard. At the end of the tape, each teacher was asked to name each verbal response they heard. One-hundred percent agreement was obtained as each teacher heard one verbal response and named the appropriate verbal

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<sup>1</sup>Tape supplied by Dr. Robert Brashear, Teacher Education, Western Michigan University.

response. Following the group meeting, individual meetings were once again initiated and the research expectations were discussed. At this point, the writer concluded that each teacher had a complete understanding of his or her role in the research design.

The training of the raters followed the same procedures as did the training of the teachers. Individual sessions with each of the raters was conducted. The following hand-out was discussed in detail:

1. Each rater will keep count of the number of voluntary student responses (verbal) and the number of students that voluntarily raise their hands for each class period. Each rating will be plotted on class seating charts so the responses can be analyzed on an individual basis.
2. Each rater will keep count of the number of praise responses given by the teacher for each class period.

Following the discussion of rater methods, the same handout defining praise was given to the raters. Once the raters understood his or her research expectations the meeting concluded, and a group meeting was scheduled. At the group meeting, the research expectations of the raters were completely discussed. Following the discussion, the same tape used in the training of the teachers was played. The raters were asked to record each verbal response of praise that they heard from the teacher. The raters had no knowledge of the number of verbal praise statements that were given by the



teacher: one-hundred percent agreement was obtained between the raters and the correct verbal praise response. After the group meeting, individual sessions were conducted with each rater. At this point, the writer concluded that the raters had a complete understanding of their role in the study. During the research numerous contacts with each teacher and each rater were held by the writer. Also, on a very limited scale the writer served as a rater whenever the rater could not do the rating.

The tester (the writer) followed the tester behavior when appropriate:

Each time testing is done the students will be told by the tester that the school is accumulating information on high school students to be used by the guidance department for research purposes.

After the training sessions, the research commenced.

During the first ten days (it was impossible to have consecutive days because of the structure of public schools-assemblies, fire drills, bomb scares, etc. The class days followed each other to the highest degree possible.) of the research, the baseline section was conducted to obtain scores on the number of times students voluntarily responded verbally. The number of times students voluntarily raised their hands during each class period was also recorded. In the baseline section of the research no verbal reinforcement was given by the teacher. At the end of the baseline section

of the research, the Brown-Holtzman Survey of Study Habits and Attitudes and the Teacher Image Questionnaire were given to the students.

After the initial testing, the experimental section of the research started. Each teacher verbally reinforced his or her class two times each day during the first half hour of the class period. Once every other day verbal reinforcement was given regarding the students' study habits. Aside from the structured praise, each teacher praised his or her students at every opportunity. At the end of ten days, the data gathering devices were once again given to the students.

Following the experimental section of the research, a ten day extinction period started. The extinction period of the research paralleled the baseline section of the research in that no verbal praise was given. At the end of the extinction period, the data gathering devices were once again administered to the students. The research was concluded at this point.

#### Instrumentation

Study habits were defined as scores received on the Brown-Holtzman Survey of Study Habits and Attitudes. The SSHA was developed to assess attitudes towards academic work and motivation for study. Correlations between the SSHA and single semester grade point averages in college

students range from 0.27 to 0.66. Correlations for high school students are somewhat lower (exact scores were not reported). Reliability coefficients range from 0.79 to 0.95 for different groups and different methods (Deese, 1959; Wreen and Lewis, 1959).

Teacher image was defined as scores received on the Teacher Image Questionnaire. The TIQ was designed at Western Michigan University to measure perceived teacher image. Reliability coefficients range from 0.82 to 0.95 (Bryan, 1968). Although the TIQ lacks validity checks, the instrument has been found to upgrade perceived teacher image when used as a feedback instrument (Bryan, 1963).

#### Data Analysis

One-way analysis of variance was computed for hand raising responses, verbal responses, teacher image, and study habits. One-way analysis of variance was used to analyze the effects of praise on the dependent variables within each individual classroom.

Multiple factor analyses of variance was computed for hand raising responses, verbal responses, teacher image, and study habits. The data was cross-partitioned by each of the three teachers and by treatment. The cross-partition was done to analyze the interaction effects of praise and teachers, the effects of teachers on the dependent variables, and the effects of praise on the students as one total unit.

Verbal responses were correlated with teacher image and study habits; hand raising responses were correlated with teacher image and study habits. Correlations were computed for all the students as one total unit, and correlations were computed on an individual class basis to detect any relationship difference between the total number of students and individual class sections.

For each model, p levels were reported when appropriate.

### Summary

Chapter three described the sample and the procedure used in the study. Instrumentation and data analysis were also discussed. In Chapter four research findings will be reported and discussed.

## CHAPTER IV

### RESEARCH FINDINGS

Chapter four reports data relevant to research hypotheses discussed in Chapter one. Each hypothesis is stated and the appropriate statistical findings are reviewed.

#### Restatement of the Problem

The study was designed to facilitate theory building in operant technology regarding three questions:

1. What effect does operant technology have upon individuals in a group setting regarding variables that are directly measurable?
2. What effect does operant technology have upon behavior in a group setting that is indirectly measurable?
3. What is the relationship between indirect measures of behavior and direct measures of behavior?

Stated more concisely, the questions considered were what effect does reinforcing individuals in a classroom setting have upon the students' number of voluntary hand raising responses, number of voluntary verbal responses, their perceptions of the teacher and their study habits? In addition, the relationship between indirect measures of behavior (teacher image and study habits) and direct measures of behavior (student hand raising responses and student verbal responses) was analyzed.

## Reporting the Results

Out of a possible fifty-three students, thirty-six students were selected for statistical analysis. The selection was based on a minimum of 70% (or above) attendance for each of the three research sections. A 70% level was selected since it allowed for a sufficient number of subjects, and a high degree of student attendance. For each selected subject, means scores were adjusted for student verbal responses and student hand raising responses based on a ratio of ten. For example, if a student's verbal responses totaled forty-five for nine days with one day absent his mean verbal response for each day was five; therefore, five was added to the student's verbal responses and a total of fifty verbal responses were recorded for this ten day section of the research. Mean score adjustments were done to equalize the scores for the subjects.

When a teacher praised in a "no praise" section of the research, the data for that classroom day was not used in the research. A total of five classroom days were eliminated from the research (teacher one did this three times, teacher two and teacher three one time each).

The procedure for reporting the results will be as follows: First, the questions will be stated; then, the hypotheses will be listed followed by the statistical results and a discussion. In the experimental section of the research, the total number of praise responses was as

follows -- teacher one 112 times, teacher two 57 times, and teacher three 140 times.

Question One: What effect does operant technology have upon individuals in a group setting regarding variables that are directly measurable? Two hypotheses were designed to analyze question one.

H<sub>i</sub>1: Hand raising responses will show a significant increase in the experimental period of the research in comparison to the baseline and extinction periods of the research.

To analyze the effect of the independent variable in each individual classroom a one-way analysis of variance was computed for each teacher. The data for hand raising responses for teacher one can be seen in Table 1, teacher two in Table 2, and teacher three in Table 3.

TABLE 1  
Hand Raising Responses of Students  
No Praise, Praise, No Praise Conditions  
Teacher One  
(N=20)

Source	SS	df	MS	F	p
Between	76.4	2	38.2	0.36	.70
Within	6059.3	57	106.3		
Total	6135.7	59			

TABLE 2  
Hand Raising Responses of Students  
No Praise, Praise, No Praise Conditions  
Teacher Two  
(N=7)

Source	SS	df	MS	F	p
Between	2.57	2	1.29	0.24	.79
Within	96.57	18	5.37		
Total	99.14	20			

TABLE 3  
Hand Raising Responses of Students  
No Praise, Praise, No Praise Conditions  
Teacher Three  
(N=9)

Source	SS	df	MS	F	p
Between	9.19	2	4.59	2.36	.11
Within	46.67	24	1.94		
Total	55.85	26			

The small  $F$  values and large  $p$  values supported the null hypothesis for teacher one and two. Since the  $F$  value (2.36) and  $p$  value (.11) approached acceptable levels of statistical significance for teacher three, pair-wise comparisons were computed on the following means:



TABLE 4  
Means and Standard Deviations  
Hand Raising Responses of Students  
No Praise, Praise, No Praise Conditions  
Teacher Three

Research Section	Mean	SD
1st. 2 weeks	.778	.833
2nd. 2 weeks	1.89	2.15
3rd. 2 weeks	.556	.726

The results of the pair-wise comparisons were as follows:

TABLE 5  
Pair-Wise Comparisons  
Hand Raising Responses of Students  
No Praise, Praise, No Praise Conditions  
Teacher Three

Research Sections	T Value	df	p
1 and 2	-1.447	11	.17
1 and 3	.603	18	.56
2 and 3	1.765	10	.11

The two control sections (1 and 3) were statistically similar. Approaching statistical significance were the T and p levels for research sections 1 and 2, and research sections 2 and 3. An analysis of the means indicate that the independent variable (praise) had an effect upon hand raising responses for teacher three. Following the baseline

the data in the research section evidenced an increase in hand raising responses. Once the independent variable was removed, hand raising responses decreased.

Traditional statistics would dictate that results could be termed significant only when the .05 level of significance had been reached. A new trend in behavior science research does not regard the .05 level as an absolute level to be reached, but as an arbitrary cut off point (Meyer, 1967). If teacher three desires an increase in hand raising responses, the use of praise might produce these responses. Even if the independent variable has no effect on hand raising responses and the null hypothesis should have been supported, no adverse effects with the use of praise would occur. Simply stated, it would be worth the effort.

The multiple factor analysis of variance for hand raising responses can be seen in Table 6. All of the student hand raising responses were analyzed for teacher, treatment, and interaction effects.

TABLE 6  
Hand Raising Responses of Students  
No Praise, Praise, No Praise Conditions  
(N=36)

Source	SS	df	MS	F	p
Rows	586.0	2	293.0	4.68	.01
Columns	4.38	2	2.19	.04	.97
Interaction	45.33	4	11.33	.18	.95
Within Cell	6203.2	99	62.66		

Interaction F and p levels indicate no statistically significant effects between praise (columns) and teachers (row); also, the F and p levels were not statistically significant in the columns effect (treatment). The row (teacher) F level (4.68) and p level (.01) were statistically significant. Hand raising responses appeared to be the function of individual teacher differences, and not a function of verbal praise and teachers. Since significant row effects were found in three of the four dependent variables, a discussion of this finding followed the analysis of variances.

The second hypothesis relating to question one was as follows:

- H<sub>12</sub>: Student verbal responses will show a significant increase in the experimental period of the research in comparison to the baseline and extinction periods of the research.

To analyze the effect of the independent variable on verbal responses in each individual classroom a one-way analysis of variance was computed for each teacher; the results can be seen in Tables 7, 8, and 9.

TABLE 7  
Verbal Responses of Students  
No Praise, Praise, No Praise Conditions  
Teacher One  
(N=20)

Source	SS	df	MS	F	p
Between	2088.1	2	1044.1	3.81	.03
Within	15559.6	57	273.0		
Total	17647.7	59			

TABLE 8

Verbal Responses of Students  
No Praise, Praise, No Praise Conditions  
Teacher Two  
(N=7)

Source	SS	df	MS	F	p
Between	1.81	2	.91	0.00	>.99
Within	2350.0	18	130.56		
Total	2351.8	20			

TABLE 9  
Verbal Responses of Students  
No Praise, Praise, No Praise Conditions  
Teacher Three  
(N=9)

Source	SS	df	MS	F	p
Between	2849.56	2	1424.8	0.57	.58
Within	59647.11	24	2485.3		
Total	62496.67				

Teacher one's F level (3.82) and p level (.03) were statistically significant, but inspection of the means (section 1 and mean 6.56, section 2 mean 8.80, section 3 mean 20.1) indicated that concomitant variables not analyzed accounted for the variance. Pair-wise comparisons substantiated the inspection (sections 1 and 2  $T = -0.66$   $p = .52$ , sections 1 and 3  $T = -1.88$   $p = .07$ ). The data supported the null hypothesis for teachers one and two.

The multiple factor analysis of variance for verbal responses can be seen in Table 10. The data was analyzed for teacher, treatment, and interaction effects.

TABLE 10  
Verbal Responses of Students  
No Praise, Praise, No Praise Conditions  
(N=36)

Source	SS	df	MS	F	p
Row	12943.0	2	6471.5	8.30	<.001
Columns	1171.2	2	585.6	0.75	.52
Interaction	3181.5	4	795.4	1.02	.40
Within Cell	77230.6	99	780.1		

The F level and p level supported the null hypothesis for columns and interaction. The row F level (8.30) and p level (<.001) were statistically significant. The number of verbal responses appeared to be a function of individual teacher differences as were participation responses.

Question Two: What effect does operant technology have upon behavior in a group setting that is indirectly measurable? Two hypotheses were designed to analyze this question. The first hypothesis was as follows:

- H<sub>1.3</sub>: Teacher image will show a significant positive increase in the experimental period of the research in comparison to the baseline and extinction periods of the research.

To analyze the effects of praise on each teacher's image, a one-way analysis of variance was computed for each teacher. The analysis of verbal responses can be seen in Tables 11, 12, and 13.

TABLE 11  
Verbal Responses of Students  
No Praise, Praise, No Praise Conditions  
Teacher One  
(N=20)

Source	SS	df	MS	F	p
Between	48.54	2	24.3	0.29	.75
Within	4780.80	57	83.87		
Total	4829.33	59			

TABLE 12  
Verbal Responses of Students  
No Praise, Praise, No Praise Conditions  
Teacher Two  
(N=7)

Source	SS	df	MS	F	p
Between	60.67	2	30.33	0.32	.73
Within	1684.29	18	93.57		
Total	1744.95	20			

TABLE 13  
Verbal Responses of Students  
No Praise, Praise, No Praise Conditions  
Teacher Three  
(N=9)

Source	SS	df	MS	F	p
Between	102.74	2	51.37	0.31	.74
Within	3996.00	24	166.50		
Total	4098.74				

For each teacher very low F levels and very high p levels supported the null hypothesis with regard to the effects of praise on teacher image. The multiple factor analysis of variance for teacher image can be seen in Table 14.

TABLE 14  
Teacher Image  
No Praise, Praise, No Praise Conditions  
(N=36)

Source	SS	df	MS	F	p
Rows	904.84	2	452.42	4.19	.02
Columns	46.04	2	23.02	0.21	.81
Interaction	283.42	4	45.86	0.43	.79
Within Cell	10681.09	99	107.89		

The F levels and p levels supported the null hypothesis for the effects of columns and interaction. Consistent

with the findings in hand raising responses and verbal responses, statistically significant row effects ( $F = 4.19$  and  $p = .02$ ) were found. The row (teacher) effect created significant variance in teacher image.

The second hypothesis regarding question two was as follows:

- H<sub>i4</sub>: The study habits of the students will show a significant positive increase in the experimental period of the research in comparison to the baseline and extinction periods of the research.

One-way analysis of variances was computed for each individual teacher regarding the students' study habits; the results can be seen in Tables 15, 16, and 17.

TABLE 15  
Student Study Habits  
No Praise, Praise, No Praise Conditions  
Teacher One  
(N=20)

Source	SS	df	MS	F	p
Between	72.93	2	36.47	0.05	.95
Within	44452.80	57	779.87		
Total	44525.73	59			



TABLE 16  
Student Study Habits  
No Praise, Praise, No Praise Conditions  
Teacher Two  
(N=7)

Source	SS	df	MS	F	p
Between	197.24	2	98.62	0.11	.90
Within	15792.57	18	877.37		
Total	15989.81	20			

TABLE 17  
Student Study Habits  
No Praise, Praise, No Praise Conditions  
Teacher Three  
(N=9)

Source	SS	df	MS	F	p
Between	276.52	2	138.26	0.16	.85
Within	21297.78	24	887.41		
Total	21574.30	26			

For all three teachers very low F levels and very high p levels supported the null hypothesis regarding the effects of praise on the study habits of students. Multiple factor analysis of variance was computed on study habits. The data was analyzed for teacher, treatment, and interaction effects; the results can be seen in Table 18.

TABLE 18  
Student Study Habits  
No Praise, Praise, No Praise Conditions  
(N=36)

Source	SS	df	MS	F	p
Row	246.29	2	125.13	0.15	.86
Columns	113.99	2	57.00	0.07	.93
Interaction	503.32	4	125.83	0.15	.96
Within Cell	81543.15	99	823.67		

No statistically significant F and p levels were indicated for rows, columns, or interaction. Study habits were the only dependent variables that did not statistically support a significant row effect.

#### Discussion of the Analysis of Variances

The data from one teacher with the dependent variable of student hand raising responses approached statistical acceptance ( $F = 2.36$ ,  $df = 2, 24$ ,  $p = .11$ ) with the means in the research direction when the data was analyzed by one-way analysis of variance. One-way analysis of variance was computed for each teacher's student scores, and the scores of the students as a total unit for each of the dependent variables -- student hand raising responses, verbal responses, teacher image, and study habits. With the exception of one teacher who met with greater hand raising

responses, verbal praise did not effect the dependent variables to acceptable levels of statistical significance.

When multiple factor analysis of variance was used, three of the dependent variables were statistically significant in the row effect -- student hand raising responses ( $F = 4.68$ ,  $df = 2$ ,  $99$ ,  $p = .01$ ), verbal responses ( $F = 8.30$ ,  $df = 2$ ,  $99$ ,  $p < .001$ ) and teacher image ( $F = 4.19$ ,  $df = 2$ ,  $99$ ,  $p = .02$ ). The factor(s) that produced these row effects has been termed individual teacher differences by the writer. Perhaps, this is the same factor(s) that Coats (1970) termed "charisma," and Combs (1965) termed the "self as instrument" concept. The study has identified one variable that does not facilitate the significant teacher effect; that variable was verbal praise. The variables that produced the significant teacher effects are open to experimental investigation.

Question Three: What is the relationship between indirect measures of behavior and direct measures of behavior? Teacher image and study habits were the indirect measures of behavior, and the direct measures of behavior were hand raising responses and verbal responses. Four hypotheses were designed to analyze question three. The first hypothesis was as follows:

- H<sub>15</sub>: Verbal responses and teacher image will demonstrate higher correlations in the experimental period of the research than in the baseline and extinction periods of the research.

Correlations were computed (Pearson Product Moment Correlations were used for all of the correlations reported in Chapter four) for the total number of student scores for each research section; the results were as follows:

TABLE 19  
Correlations: Student Verbal  
Responses and Teacher Image  
N=36

Research Section	Correlations
1st. 10 days	.03
2nd. 10 days	.09
3rd. 10 days	.13

No significant levels of correlations (comparing the correlations to significance tables) were found. Table 19 supported the null hypothesis. The correlations of verbal responses and teacher image for each individual teacher can be seen in Tables 20, 21, and 22.

TABLE 20  
Correlations: Student Verbal  
Responses and Teacher Image  
Teacher One  
N=20

Research Section	Correlations
1st. 10 days	.30
2nd. 10 days	-.16
3rd. 10 days	-.14

TABLE 21

Correlations: Student Verbal  
Responses and Teacher Image  
Teacher Two  
N=7

Research Section	Correlations
1st. 10 days	-.005
2nd. 10 days	.36
3rd. 10 days	.48

TABLE 22

Correlations: Student Verbal  
Responses and Teacher Image  
Teacher Three  
N=9

Research Section	Correlations
1st. 10 days	.026
2nd. 10 days	.43
3rd. 10 days	.41

For each of the three teachers the results were mixed, and no significant levels of correlation were found. The data supported the null hypothesis.

The second hypothesis relating to question three was as follows:

- H<sub>16</sub>: Verbal responses and study habits will reveal higher correlations in the experimental period of the research than in the baseline and extinction periods of the research.

Correlations were computed for all the scores for each research section; the correlations were as follows:

TABLE 23  
Correlations: Student Verbal  
Responses and Student Study Habits  
N=36

Research Section	Correlations
1st. 10 days	.06
2nd. 10 days	-.08
3rd. 10 days	-.18

The correlations gradually declined with the last two research sections revealing inverse relationships at low levels of correlation. Since the results were mixed and no significant levels of correlation were found, the null hypothesis was supported.

For each individual classroom the correlations between student verbal responses and student study habits can be seen in Tables 24, 25, and 26.

TABLE 24  
Correlations: Student Verbal  
Responses and Study Habits  
Teacher One  
N=20

Research Section	Correlations
1st. 10 days	-.16
2nd. 10 days	-.27
3rd. 10 days	-.16

TABLE 25

Correlations: Student Verbal  
Responses and Study Habits  
Teacher Two  
N=7

Research Section	Correlations
1st. 10 days	.70*
2nd. 10 days	.72*
3rd. 10 days	.27

\*p Value  $< .05$

TABLE 26

Correlations: Student Verbal  
Responses and Study Habits  
Teacher Three  
N=9

Research Section	Correlations
1st. 10 days	.29
2nd. 10 days	-.20
3rd. 10 days	-.34

The results were mixed. The data for teacher one revealed inverse relationships; data for teacher two revealed high correlation for the first and second sections of the research ( $p < .05$ ) then revealed a sudden drop in relationship; the data for teacher three revealed a steady decline in relationship (a discussion of this will follow presentation of the correlations).

The third hypothesis relating to question three was as follows:

- H<sub>i</sub>7: Student participation responses and teacher image will demonstrate higher correlations in the experimental period of the research than in the baseline and extinction periods of the research.

Correlations for all the scores as one total unit between student hand raising responses, and teacher image can be seen in Table 27.

TABLE 27  
Correlations: Student Hand Raising  
Responses and Teacher Image  
N=36

Research Section	Correlations
1st. 10 days	.29*
2nd. 10 days	-.15
3rd. 10 days	.03

\*p Value < .05

The results were mixed and showed scattered variance.

Correlations for each individual classroom between student hand raising responses and teacher image can be seen in Tables 28, 29, and 30.



TABLE 28

Correlations: Student Hand Raising  
Responses and Teacher Image  
Teacher One  
N=20

Research Section	Correlations
1st. 10 days	.38*
2nd. 10 days	-.29
3rd. 10 days	-.22

\*p Value  $< .05$

TABLE 29

Correlations: Student Hand Raising  
Responses and Teacher Image  
Teacher Two  
N=7

Research Section	Correlations
1st. 10 days	-.18
2nd. 10 days	.40
3rd. 10 days	.49

TABLE 30  
Correlations: Student Hand Raising  
Responses and Teacher Image  
Teacher Three  
N=9

Research Section	Correlations
1st. 10 days	-.17
2nd. 10 days	-.28
3rd. 10 days	-.26

The results were mixed. The data showed scattered variance that supported the null hypothesis.

Hypothesis four relating to question three was as follows:

H<sub>i</sub>8: Student hand raising responses and study habits will reveal higher correlations in the experimental period of the research than in the baseline and extinction periods of the research.

Correlations for the scores as one total unit between student hand raising responses and study habits can be seen in Table 31.

TABLE 31  
Correlations: Student Hand Raising  
Responses and Study Habits  
N=36

Research Section	Correlations
1st. 10 days	-.16
2nd. 10 days	-.20
3rd. 10 days	-.18

The data revealed low levels of inverse relationships that supported the null hypothesis.

Correlations for the data obtained for each individual classroom can be seen in Tables 32, 33, and 34.

TABLE 32

Correlations: Student Hand Raising  
Responses and Study Habits  
Teacher One  
N=20

Research Section	Correlations
1st. 10 days	-.21
2nd. 10 days	-.31
3rd. 10 days	-.26

TABLE 33

Correlations: Student Hand Raising  
Responses and Study Habits  
Teacher Two  
N=7

Research Section	Correlations
1st. 10 days	-.15
2nd. 10 days	.42
3rd. 10 days	.25

TABLE 34

Correlations: Student Hand Raising  
Responses and Study Habits  
Teacher Three  
N=9

Research Section	Correlations
1st. 10 days	.07
2nd. 10 days	.09
3rd. 10 days	.35

Once again mixed results were found. Correlations for teacher one were all inverse relationships: correlations for teacher two approached the research hypothesis with a large increase in the experimental section of the research and a decline in the extinction period of the research (no significant levels of correlations were found); the data for teacher three revealed low levels of correlations.

#### Discussion of the Correlations

The results were mixed and no systematic analysis of the data could be made. What was relevant was that under certain conditions indirect measures of behavior and direct measures of behavior were highly correlated. The data for teacher two revealed a correlation of .70 ( $p < .05$ ) between verbal responses and study habits in the baseline section of the research; common factor variance was 49%

which indicated that under the given conditions 49% of what was being measured by verbal responses was also overlapping with the students' study habits measurement. In the experimental section of the research the data for teacher two concerning verbal responses and study habits revealed a correlation of .72 ( $p < .05$ ); common factor variance was 51.84%. In the baseline section, the student hand raising responses and teacher image data for teacher one revealed a correlation of .38 ( $p < .05$ ); the common factor variance was 14.44%. The total hand raising responses and teacher image correlations for the baseline section was reported at .29 ( $p = .05$ ); the common factor variance was 8.41%. In addition to the positive correlations, negative correlations as high as -.34 were reported (no significant levels of correlations were obtained in the inverse relationships).

What the conditions were that produced high positive correlations or high negative correlations are open to experimental investigation. At this time, it can only be stated that these conditions exist and that verbal praise does not have a consistent influence upon these conditions.

#### Summary

One-way analysis of variances was computed for the scores students received on hand raising responses, verbal responses, teacher image, and study habits; pair-wise comparisons were computed when appropriate. The null hypothesis was supported for the vast majority of the computations.

From only one teacher, the data on the dependent variable of hand raising responses approached statistical significance.

Multiple factor analysis of variances was computed and significant row (teacher) effects were found. The row effects were significant for the dependent variables of hand raising responses, verbal responses, and teacher image.

Correlations were computed for indirect measures of behavior (teacher image and study habits) and direct measures of behavior (student hand raising responses and verbal responses). The results were mixed and the need for research to analyze the complex relationship between indirect measures of behavior and direct measures of behavior was stated.

## CHAPTER V

### SUMMARY, DISCUSSION AND RECOMMENDATIONS

#### Summary

A review of the literature on behavior modification in school settings revealed that the vast amount of research has been done in pre-school settings, special classrooms, and elementary school classrooms. Research in junior high school classrooms and high school classrooms is extremely scarce. It is also of note that the research reported has been done on direct measures of behavior and has centered on single organism research. As a result of the limited scope of behavior modification research, questions regarding the effectiveness of behavior modification in junior high schools and high schools are unanswered. In addition, the effectiveness of behavior modification upon individuals in group settings, the effectiveness of this approach on indirect measures of behavior, and the relationship between indirect measures of behavior and direct measures of behavior has not been demonstrated.

The present research was conducted to facilitate theory building regarding three questions:

1. What effect does operant technology have upon individuals in a group setting regarding variables that are directly measurable?

2. What effect does operant technology have upon behavior in a group setting that is indirectly measurable?
3. What is the relationship between indirect measures of behavior and direct measures of behavior?

Specifically, what effect will reinforcing individuals in a classroom setting have upon the students' number of voluntary hand raising responses, number of voluntary verbal responses, perceptions of the teacher and study habits? In addition, what is the relationship between indirect measures of behavior (teacher image and study habits) and direct measures of behavior (student hand raising responses and student verbal responses)?

To answer these questions thirty-six high school students were assigned by the process of computer class scheduling to one of three psychology classes taught by three different teachers. During the first ten days of the research, no verbal praise was given by the teachers. At the end of this section of the research, the students were tested for study habits using the Brown-Holtzman Survey of Study Habits and Attitudes, and their perceptions of the teachers using the Western Michigan University Teacher Image Questionnaire. The next ten days was the experimental section of the research, and the teachers gave verbal praise to their students. The students were tested a second time. Following the experimental section of the research, the extinction section of the study started. As



with the first section of the research, no verbal praise was given by the teachers for ten days. At the end of the extinction section of the research, the students were once again tested. During the data collection, trained raters were in each teacher's classroom to record the voluntary verbal and hand raising responses of the students and to record the number of verbal praises used by each teacher.

The data were analyzed by using one-way analysis of variance, multiple factor analysis of variance, and Pearson Product Moment correlation. Using one-way analysis of variance the data from one teacher approached statistical acceptance ( $F = 4.68$ ,  $df = 2$ ,  $99$ ,  $p = .01$ ), verbal responses ( $F = 8.30$ ,  $df = 2$ ,  $99$ ,  $p < .001$ ), and teacher image ( $F = 4.19$ ,  $df = 2$ ,  $99$ ,  $p = .02$ ). The correlations reported mixed results and no systematic analysis of the data could be made.

### Discussion

The results of the study do not support the hypothesis regarding the effectiveness of verbal praise as an independent variable in normal public school classrooms upon the dependent variables of verbal responses, teacher image, and study habits. Limited support of verbal praise as an independent variable upon the dependent variable of hand raising responses is indicated. The effectiveness of individual teacher differences upon hand raising responses, verbal responses, and teacher image was statistically supported.

Although the correlations were mixed and no systematic analysis of the data could be made, a number of relevant observations were made. Under certain conditions indirect measures of behavior and direct measures of behavior were highly correlated. For teacher two the correlation was .70 ( $p < .05$ ) between verbal responses and study habits in the baseline section of the research, with the common factor variance being 49%. The correlation for teacher two in the experimental section of the research between verbal responses and study habits was .72 ( $p < .05$ ); the common factor variance was 51.84%. Other significant correlations were reported in Chapter four; a correlation of  $-.34$  was also reported. The conditions that produced these relationships are open to investigation. Whatever these conditions were, verbal praise did not have a consistent effect upon them.

#### Recommendations

The research reported of behavior modification on an individual in a group setting is limited (Zimmerman, Zimmerman, and Russell, 1969). The reported research in junior high schools and high schools is also extremely limited. Reported research regarding the effectiveness of behavior modification upon indirect measures of behavior is nonexistent as is the reported research regarding the relationship between indirect measures of behavior and direct measures of behavior. Therefore the recommendation for research in the above named areas is paramount.

Conducting research in public school classrooms is methodologically difficult (Madsen, Becker, and Thomas, 1968). Although the research is difficult, one recommendation would be to initiate research using multiple baseline techniques as compared to reversal techniques. Baer, Wolf, and Risley (1968) outlined the two approaches:

In using the reversal technique, the experimenter is attempting to show that an analysis of the behavior is at hand: that whenever he applies a certain variable, the behavior is produced, and whenever he removes this variable, the behavior is lost...

In the multiple-baseline technique, a number of responses are identified and measured over time to provide baselines against which changes can be evaluated. With these baselines established, the experimenter then applies an experimental variable to one of the behaviors, produces a change in it, and perhaps notes little or no change in the other baselines. If so, rather than reversing the just-produced change, he instead applies the experimental variable to one of the other, as yet unchanged, responses. If it changes at that point, evidence is accruing that the experimental variable is indeed effective, and that the prior change was not simply a matter of coincidence. The variable then may be applied to still another response, and so on (p. 94).

By using multiple baseline techniques effective behavioral modification would not be reversed, a condition that people in the public schools find undesirable.

The common factor variance between indirect measures of behavior and direct measures of behavior was not consistent in this research, but at times ranged as high as

51.84%. It is time that the perceptual researchers and the experimental researchers stopped emphasizing their differences and promoted cooperation. The two approaches may have more in common than they now believe.

The implications of the study for theory building in behavior modification are as follows: First, the study does not support the concept of praise as a generalized reinforcer; a concept that behavior modification writers believe exists. If the findings of the present study are replicated and found to be valid then it can be stated that praise as a generalized reinforcer is not effective in secondary school classrooms. While praise as an independent variable has been effective in the elementary setting where informational learning is dominant, at the secondary level where integrative learning is desirable its effect is seriously questioned. Secondly, the impact of behavior modification upon indirect measures of behavior has been neglected in the theoretical framework of behavior modification. Indirect measures of behavior do exist, and in order to expand the theoretical concepts of behavior modification indirect measures of behavior need to be given consideration in behavior modification research. Since measures of indirect behavior are obtainable, they must in fact exist. They are reflective of internal mediating processes of the human organism and they are not totally dependent upon environmental stimuli for influence. Finally, the common factor

variance between indirect and direct measures of behavior has been omitted in the theoretical framework of behavior modification. The study has found the common factor variance to range as high as 51.84%. For the techniques and concepts of behavior modification to expand, the areas of generalized reinforcers, indirect measures of behavior, and the common factor variance between indirect measures and direct measures of behavior will have to be incorporated into the structure of behavior modification theory.

Behavior modification has proved to be effective on a limited scale. It is time to expand the concepts and techniques of behavior modification. The writer is hopeful that the study provides direction for expanding the concepts and techniques of behavior modification.

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