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## Increasing the Verbal Response Rate of a Mentally Retarded Girl

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INCREASING THE VERBAL RESPONSE RATE OF A  
MENTALLY RETARDED GIRL

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A Thesis  
Presented to  
the Graduate Faculty  
Central Washington State College

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

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by  
Preston W. C. Smith

July, 1970

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## CHAPTER I

### INTRODUCTION

The exceptional child of today faces the same problems as the rest of society: however, these problems are often more severe for them as they are handicapped in many different aspects. Several leaders in the field of special education have set out to formulate general goals for our educational system to help these children combat such problems. Dunn (1966) states that these goals for the educable mentally retarded child are centered around independent living skills. He lists fourteen typical ingredients which might be included in such a system. His first ingredient is oral and written communication.

In Orr's (Cited in Dunn, 1966) listing of major curriculum ingredients, he presents seven major areas. Communications arts is the first topic listed. G. Orville Johnson (1965) states that adequate speech and language are invaluable skills, that they are of even greater importance than reading. Verbal communication is the most commonly used and important form of communication. It is continuously necessary to communicate with others in all kinds of social and economic relationships. It is essential that the slow learner be taught to communicate as effectively as possible so as to learn to make good social and vocational adjustments as easily as possible.

Whelan and Haring (1966) state that learning through verbal interaction is often emphasized in classrooms. That is, the children are expected to receive auditory stimuli, interpret them with understanding, process them and then respond in the manner dictated by the verbal stimuli. Normal children who have over a period of years, learned to control their behavior as a result of consequences contingent upon verbal emissions, usually function adequately in such classroom situations. Stated another way, their behavior is under the control of environmental consequences.

The study by Rankin (Cited in Nichols, 1957) revealed that individuals from different occupational fields spend 70% of each day in verbal communication. Of this figure, 16% was spent in reading, 9% in writing, 45% in listening and 30% in talking.

#### PURPOSE

This investigation was instigated to assess the effectiveness of a systematic application of reinforcement on the verbal response rate of a withdrawn, educable mentally retarded student in a junior high school special education class.

The research contains several studies demonstrating the effectiveness of behavior modification on verbal behavior. Issacs, Thomas and Goldiamond (1960) found behavior modification successful in reinstating verbal behavior in psychotics. Rickard and Dinoff (1962) revealed that verbal behavior (non-delusional speech) could be conditioned in the neuropsychiatric patient they worked with, and further, that this

behavior was not quickly extinguished as predicted due to the direct conditioning procedures which resulted in such speech.

The purpose of this study was to test the following hypothesis:

There will be no statistically significant difference in the subject's verbal response rate between the baseline average and under conditions of systematic application of reinforcement.

#### DEFINITION OF TERMS

Verbal response. For purposes of this study a verbal response will be considered any word or group of words uttered by the subject, either in response to conversation, to the answering of questions or the asking of questions during the classroom sessions.



## CHAPTER II

### REVIEW OF THE LITERATURE

Research over the past several years has provided a great abundance of materials related to theories of reinforcement on many different types of conditioning. A fair amount of this research is devoted to verbal behavior. Not all of the materials presented in this section of the paper are directly related to the type of conditioning done in the study, but all have definite implications to this report.

Mazik (1967) has pointed out that operant conditioning is by no means a new technique; however, its effects have suffered in the past due to the lack of a definition and systematic application of current learning principles. Once behavior principles are clearly delineated and then utilized in a systematic manner to train individuals, research has shown the end result to be much more effective.

One of the principles which has proven effective in changing behavior is the Premack principle. This principle states that any high-probability behavior, contingent on low-probability behavior, will reinforce that preceding low-probability behavior. Such a system allows the use of any high-probability behavior as a reinforcer for any low-probability behavior. Also, any one high-probability behavior should have the same effect as any other high-probability behavior, so long as the high-probability still

exists. (Cited in G. O. Johnson, 1965)

The twenty-three principles set forth by Ayllon and Azrin (1968) in The Token Economy might well be employed by those attempting reinforcement with other persons. These principles came about through the experiment by the investigators with patients in the Anna State Hospital.

Skinner (Cited in Krasner, 1958) points out that the term verbal behavior emphasizes the individual speaker and whether recognized by the user or not, specifies behavior shaped and maintained by mediated consequences. Upon the completion of reviewing thirty-one studies on verbal behavior, he states that verbal behavior is amenable to experimental analysis.

Studies related to verbal behavior can be separated into several categories. One category is commonly credited to Taffel (1965). This type is one in which the subject orally emits sentences based upon a verb and one of several pronouns printed on each of a series of stimulus cards. A similar type is that of Humphreys. (Cited in Krasner, 1958) This procedure consists of a conditioned response of pressing one of two available keys to predict the occurrence of a random event. Following the subject's prediction, and independently of it, the examiner presents one of the to-be-predicted events according to a pre-determined random sequence. Another variation of this type of investigation is that in which the occurrence of the reinforcement event is contingent upon the appropriateness of the subject's response. These studies have been employed to test predictions from statistical learning theories.

Skinner (Cited in Krasner, 1958) has identified yet another area of verbal behavior studies: those of verbal learning under various reward and punishment conditions, studies of learning a verbal task under various motivational sets and attitudinal influences. In these studies the subject is asked to emit verbal behavior in terms of a given task, and the experimenter attempts to reinforce a pre-selected class of his verbal behavior by carefully controlled verbal and non-verbal cues.

In Greenspoon's (1954) experiment on determining the effect of two operations on two verbal responses, the subjects were instructed to say all of the single words they could think of in fifty minutes. One of the contingent stimuli was introduced immediately following each response of a predetermined class during the first twenty-five minutes and omitted during the second period of twenty-five minutes. The results indicated that 'mmm-hmm' increased the frequency of plural responses and 'huh-uh,' decreased the frequency of plural responses. Both stimuli tended to increase the frequency of non-plural responses. Thus the contingent stimulus, 'mmm-hmm,' had the same effect on both responses. The stimulus, 'huh-uh,' had different effects on the two responses. This differential effect on the two responses suggested that the nature of the response is a determinant of the reinforcing character of the stimulus.

An investigation by Meyer, Swanson, and Kauchack (1965) entitled "Studies of Verbal Conditioning: I. Effects of Age, Sex, Intelligence and Reinforcing Stimuli," demonstrated the

feasibility of using children in the verbal conditioning situation. This study also revealed that with appropriate modification, verbal conditioning procedures can be used over a wide range of ages. The investigators found that conditioning with fourth and sixth grade children was not significantly influenced by age or sex differences, but a tendency existed for brighter children to condition more rapidly. Locke (1969 A) also found that there was an absence of sex differences in the conditioning of the retarded.

Salzinger, Feldman, Rickard, Cowan and Salzinger (Cited in Krasner and Ullman, 1965) reported in their study of operant conditioning of verbal behavior of two speech deficient boys that it is possible to condition vocalization rate and to shape a small vocabulary by reinforcing successive approximations to words. With the second subject they could use a social reinforcer to condition speech and to gain discriminative control over a variety of responses.

Salzinger, Salzinger, Portnoy, Eckman, Bacon, Deutsch, and Zubin (1962) also found that the use of operant conditioning techniques in conjunction with special instructions has proved successful in evoking long samples of continuous speech (monologues) from schizophrenic patients.

Rickard, Dignam and Horner (1960) investigated the "Verbal Manipulation in a Psychotherapeutic Relationship." In their investigation a direct attempt was made to reduce the specific class of deviant verbal behavior; no attempt was made to cope with underlying attitudes, dynamics or feelings. A high level of

rational speech was obtained in this patient through elicitation and reinforcement techniques. This newly established behavior showed little resistance to extinction. However, this is not too surprising since the incompatible behavior (delusional verbalizations) had been reinforced over a longer period of time and under a wide range of stimulus conditions. A follow-up study two years later revealed that contrary to popular prediction that the behavior resulting from direct conditioning procedures would quickly extinguish and/or lead to the adoption of compensatory symptoms, the subject continued to respond with predominantly non-delusional speech in the hospital situations. This finding was in accord with other direct conditions studies reported by Bandura. (Cited in Rickard and Dinoff, 1962)

In the investigation of Issacs et. al. (1960) verbal behavior was reinstated in two psychotics classified as schizophrenic; one had been mute for nineteen years and the other for fourteen. The procedures utilized involved application of operant conditioning. The relationship of such procedures, based on controlled laboratory investigations with men and animals to procedures based on clinical practices with human patients was discussed and was considered as directing our attention to shaping and increasing the probability of what normal behaviors the psychotic possesses.

Doctors (1969) study on the awareness and the effects of three combinations of reinforcement on verbal conditioning in children revealed that no operations in the design of his study would lead to the conclusion that "awareness" caused or mediated

gains in performance during conditioning. The investigator did conclude, however, that there is a similarly reliable or lawful relationship between reports on the contingency of reinforcement and performance with children that have been observed under similar experimental conditions in studies with adults.

## CHAPTER III

### PROCEDURES USED IN THE STUDY

#### The Subject

The subject was a very quiet fourteen year old girl. She was enrolled in a ninth grade special education class for the educable mentally retarded during the 1969-1970 school year. This class was located at the Ed Von Tobel Junior High School, North Las Vegas, Nevada. The subject was able to successfully complete all academic assignments given to her.

#### Materials and Apparatus

The materials utilized during this investigation were very simple. The investigator used either a wrist or key chain golf counter to record the subject's responses. During the reinforcement period the subject was provided with a small plastic jar in which to place the pennies that were used as token reinforcers. At a later stage in this period, she was given a toy ball-gum machine filled with marbles and a jar of fifty pennies. She was to place a penny in the ball-gum machine after each response and trade the marbles for rewards. However, she felt that the machine was rather immature and it was replaced with an empty plastic jar to hold the pennies.

#### Reinforcement

The subject was extremely fond of cats. After discussing

what she would be most interested in trading her points for, she decided on materials related to cats. The materials used were picture post cards of cats, small pamphlets and paperback books on cats. The subject was also given the option to trade her pennies for free time; time when she could do whatever she might want in the classroom or other school facilities provided. Also, if the student wished, she could keep the pennies as her reward.

### Procedure

Responses were recorded by the investigator, an observer, and eventually by the subject. These responses varied from one word to complete sentences and paragraphs. Regardless of the length of the response the subject received reinforcement for each one; i.e., after each question or in response to another individual's conversation. The experiment consisted of three sections: baseline, reinforcement, and the withdrawal of reinforcement periods. The experiment lasted for three fifty minute periods during the forty-six school days it was in progress. Reinforcement was administered by the experimenter until the twenty-first day of the study, at this point the subject was given pennies and told to place one penny into the proper receptacle after each verbalization.

After the subject began recording her own responses with the pennies, the daily total of pennies was compared with the number of responses recorded by the experimenter. Each day's penny count was the same as the experimenter's response count. One plausible reason for such a high degree of agreement between the subject and the experimenter is that the other students in the classroom would make sure that the subject deposited a penny after



each verbal response. If the subject forgot, the other students were sure to remind her; they appeared as interested in her reinforcements as she did.

The Dean of Students acted as the observer for this investigation. Part of her duties at the school were to act as coordinator between the Special Education program and other departments in the school. The Dean of Student's response count was compared with that of the experimenter by means of the Pearson Product Moment correlation coefficient. The results of this comparison revealed a correlation coefficient of .997.

Baseline period. The baseline period provided the control necessary to assess the effectiveness of the experiment. This period was established during the first three weeks of the school year; the period was thirteen days long.

Reinforcement period. This period began without the subject being aware of the response that was being reinforced. After each of her verbal responses she was given a penny. Beginning with the third week of this period, the ratio was raised from 1:1 to 2:1. Starting with the sixth week, other students in the class began to get an idea of what the task the subject was being reinforced for, and at this point she was told that she would be reinforced for verbal responses. She was also given the ball-gum machine and other pennies to administer her own reinforcement. After she explained her feelings about the ball-gum machine, it was substituted with a plastic jar, and she would take a penny from those provided and place it in the plastic jar. At the end

of the day the pennies were counted and compared with the investigator's record.

The subject also kept a tally sheet on the number of pennies she had earned each day. She was allowed to keep the pennies herself, or hand them in for safe keeping. She was able to trade the pennies for a reward at any time during the experiment.

Withdrawal of Reinforcement period. The last thirteen days of the study made up the withdrawal period. During this period, no token reinforcements were given to the subject. It should be noted, however, that she did receive social reinforcements from her classmates through this period and the remainder of the school year.

## CHAPTER IV

### RESULTS

Statistical analysis of the data revealed that there was a significant difference between the subject's average of baseline verbal responses and the average of the reinforcement period verbal responses.

The hypothesis that there would be no statistically significant differences in the subject's verbal response rate between the baseline average and under conditions of systematic application of reinforcement was rejected. The t-test computation for the difference between the baseline and reinforcement period resulted in the figure 9.6276 with thirty-one degrees of freedom, which is significant at higher than the .001 level of confidence. The same analysis for differences between the reinforcement and withdrawal periods yielded a figure of -3.0199 with thirty-two degrees of freedom, which is significant at the .01 level of confidence. The Fisher Exact Probability test between the baseline and other periods of the study resulted in significance at the .000000484 level of confidence.

Graphic representation of the verbal responses of the study can be seen on Figure I on page 15.

Considering the analysis of the data, there was no basis to accept the null hypothesis as there was a statistically significant difference shown.

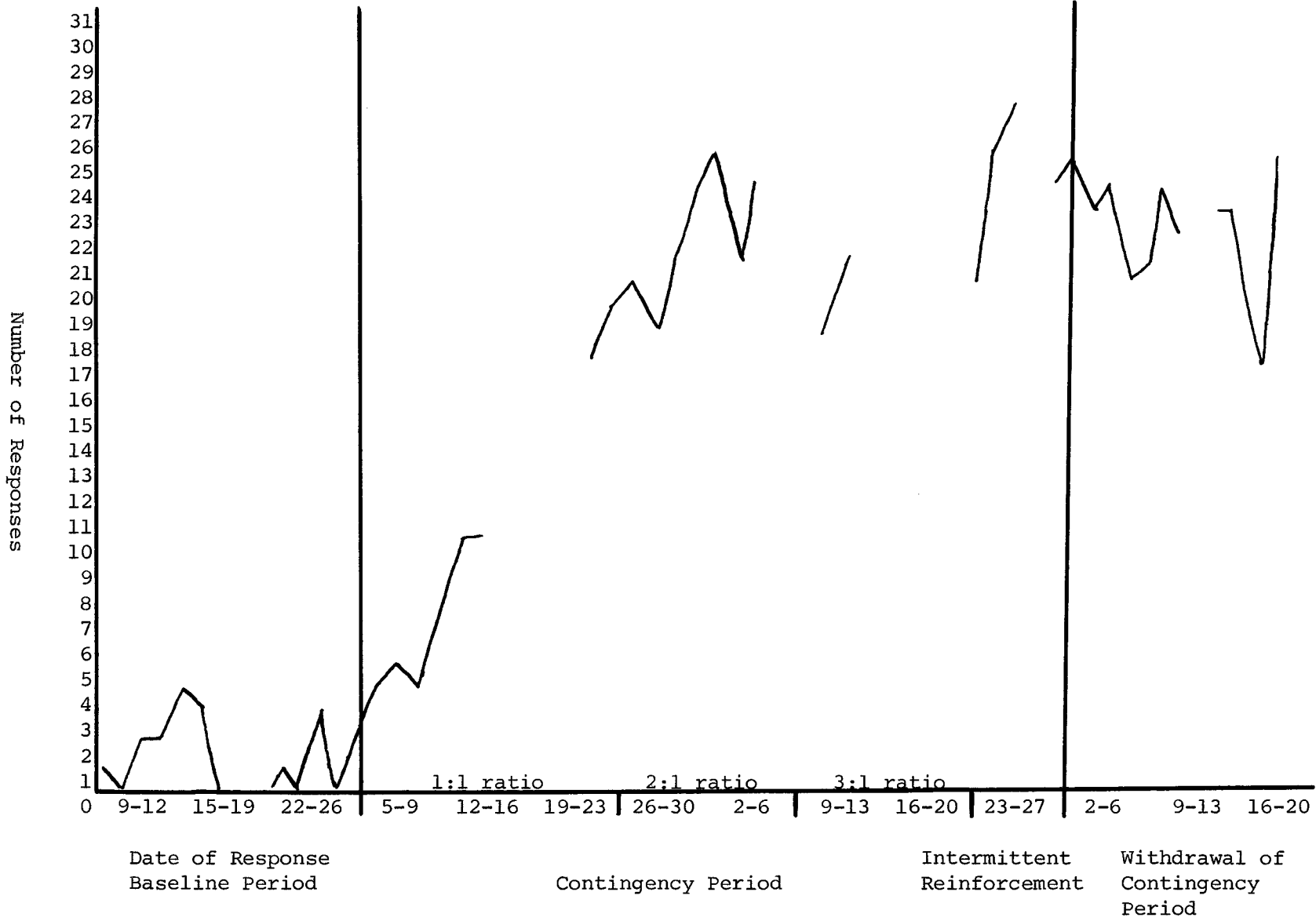


FIGURE I

## DISCUSSION

An attempt was made to assess the effectiveness of systematic application of reinforcement on the verbal response rate of an educable mentally retarded junior high school student in a special education class. The subject's baseline response rate was compared with the response rate under conditions of reinforcement.

The study revealed a statistically significant difference between the baseline period and under conditions of systematic application of reinforcement to the .00174 level of confidence.

Observations

The subject's increased verbal response rate resulted in her acceptance by other members of the class as an integral part of the group who could contribute and assist the group. This was demonstrated by the manner in which the subject now entered into class discussions; prior to this time the other students would not wait for her to answer. During the experiment and afterwards the other students not only waited for her to answer questions, but they also prompted her. This interaction resulted in an increased amount of social exchanges between the subject and the other students.

During part of the school day the subject worked as a cafeteria aide in connection with the work experience program. The women in the cafeteria noticed that she began to talk to them and enter into more conversations than she had done before the study.

Although there was no scientific measure, the investigator feels that the social reinforcement the subject received from classmates and others she came into contact with had as great an effect upon her response rate as did the tokens she received. Perhaps this fact coupled with an intrinsic motivation brought about through her increased social interaction may help explain why the response rate did not drop off significantly during the withdrawal of reinforcement period. This idea parallels the effect noted by Issacs et. al. (1960) in their study on reinstating verbal behavior in psychotics; i.e., other individuals reinforced the subject (discriminative stimuli for them) at the same time as the experimenter. Meyer et. al. (1965) noted that their results from studies of verbal conditioning revealed that stimuli without social reinforcer value were not effective in their verbal conditioning situation.

#### Implications for Education

The results obtained in this investigation are an incentive to apply such techniques to other individuals in a special education class who have a behavioral problem. It is conceivable that such a system could be carried on with several students at one time. Perhaps it would be good to start with two students and expand as the teacher gains confidence and control over this technique so that the best results may be obtained. Such a system has been in use for several years at the junior high learning disabilities classroom of the Experimental Education Unit at the University of Washington by Nolen. (Nolen, Kunzelmann, & Haring, 1967)

## CHAPTER V

### SUMMARY AND CONCLUSIONS

The investigation of this study was carried out at Ed Von Tobel Junior High School, Clark County School District, North Las Vegas, Clark County, Nevada. The subject was a fourteen year old educable mentally retarded student in the special education class.

The study compared the effects of reinforcing the verbal response rate during an eight week reinforcement period with a three week period of non-reinforcement prior to the application of reinforcement.

Responses were counted by the investigator each day of the experiment and on twelve occasions by the Dean of Students as a rater for inter-rater reliability.

When comparing the effects of the reinforcement period with the baseline period, it was found that there was a statistically significant increase in the verbal response rate. A subjective analysis of the withdrawal of reinforcement period by the investigator revealed that other reinforcers were at work during the experiment which carried over when the token reinforcement was withdrawn. These other reinforcers were believed to be a newly gained intrinsic motivation and the social interaction and approval of the subject's peer group.

The systematic application of reinforcement upon the verbal response rate of a junior high school special education

student has been demonstrated to be a highly effective and valuable technique.



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## APPENDIX A

COMPARISON OF RATERS RESPONSES  
FROM FIRST INTER-RATER OBSERVATION

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INVESTIGATOR	SUBJECT	OBSERVER
5		4
17		16
19	19	
20	20	
18	18	
21	21	21
24	24	
25	25	
21	21	
24	24	24
18	18	18
21	21	
20	20	20
20	20	
25	25	24
27	27	
24	24	24
25	25	
23	23	
24	24	
20	20	19
21	21	
24	24	24
23	23	
23	23	23
20	20	
17	17	
25	25	25

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