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THE EFFECTS OF TEACHER ATTENTION ON FOLLOWING INSTRUCTIONS IN A KINDERGARTEN CLASS[1]

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A kindergarten class, composed of five girls ages 4.8 to 6 yr, participated in the study. In each of 20 daily sessions a sequence of 10 simple instructions was given to the class, In baseline sessions, the teacher did not interact with the students, other than to give instructions. During these sessions, the children followed the teacher's instructions 60% of the time. When the teacher began attending to each child if she followed an instruction, the mean percentage of instructions followed increased to 78%. Subsequently, the teacher again employed the baseline procedures and the percentage of instructions followed decreased to 68.7%. When the teacher again provided attention dependent on the children's following the instructions, the percentage of instructions followed increased to 83.7%. The results are consistent with research that has treated instructions as discriminative stimuli. The general findings are that consequences of instructed behavior determine the extent to which the instructions are followed.

Elementary school teachers often try to develop academic skills and appropriate general classroom behaviors by verbal suggestions and instructions. If the students do not reliably follow the teacher's instructions their behaviors are likely to be labeled as discipline or achievement problems. Many forms of advice have been proffered to teachers in attempts to help them develop better instructional control over their students. For example, Peckenpaugh (1958) suggested that teachers follow general commandments, such as be sincere, consistent, firm, and friendly.

A more precise approach to an analysis of instructional control problems results from the operant conditioning literature (Terrace, 1966; Skinner, 1957). This approach views instructions as discriminative stimuli that set the occasion for the occurrence of certain behaviors. Consequently, it is possible to analyze the functional relationship that exists between verbal instructional stimuli and the listener's response to determine what environmental variables control responding to instructions. Findley (1966) found a very rapid weakening of instructed behaviors for which there were no explicit consequences. Ayllon and Azrin (1964) observed that instructions had no lasting effects on simple behaviors of mental patients unless the behaviors were followed by reinforcement. Hopkins (1968), while working with a retarded subject, found that instructing the subject increased the frequency of desired behavior but that instructions then became progressively more ineffective unless followed by reinforcement. Zeilberger, Sampen, and Sloane (1968) showed that obedience will increase when differential reinforcement is employed as a consequence of instruction following behaviors.

Little experimentation has been devoted to instructional control in the classroom. Madsen, Becker, Thomas, Koser, and Plazer (1968) studied the reinforcing properties of the individual instruction, "Sit down!" Their data indicated that the instruction reinforced students' standing behaviors. However, they suggested that most children temporarily sat down when told to do so. Zimmerman, Zimmerman, and Russell (1969) found that tokens would maintain a higher rate of instruction-following behavior than would praise. Their study was one of the first to expose all students in a classroom to a single, specific set of differential reinforcement contingencies when

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verbal instructions were given to the class as a whole.

Recently reported studies have shown adult social attention to function as a reinforcer for a pre-school child's talking (Reynolds and Risley, 1968); smiling by retarded subjects (Hopkins, 1968); and outdoor play of a pre-school child (Buell, Stoddard, Harris, and Baer, 1968). Other studies have shown that differential teacher attention can be used to control typical classroom behaviors (Hall, Lund, and Jackson, 1968; Thomas, Becker, and Armstrong, 1968; Madsen, Becker, and Thomas, 1968; and Ward and Baker, 1968).

The present research suggests at least one practical solution to the problem of developing appropriate classroom instructional control. This solution would be to combine the findings that the effects of instructions are determined by the consequences of the instructed behaviors and that teacher attention is a suitable and convenient reinforcer for the behavior of school children. Therefore, this experiment examined the effects of teacher attention on students' following the teacher's instructions.

METHOD

Subjects

Five girls, 4.8 to 6 yr of age, who were enrolled in the afternoon kindergarten at the Alto Pass Grade School in Alto Pass, Illinois, served.

Setting

The study was conducted in the school's kindergarten classroom. The room contained a teacher's desk and chair, a low rectangular table, eight student chairs, toys stacked against one wall, and a steel cabinet used to store sleeping mats and educational materials.

Instructions and Response Criteria

An arbitrary list of 10 instructions, which were frequently given by the teachers, was selected for use in this experiment. The 10 instructions and the behavioral criteria for each instruction are listed below. In every case except those noted, the indicated behaviors had to occur within 15 sec of the time the teacher spoke the instructions to be considered as meeting the criterion.

1. "Pick up the toys." This referred to any toys not in the appropriate containers against the wall. A child would pick up at least one toy or piece of a toy and place it in the container.

2. "Sit down." A child would be seated in her chair with the chair within 3 ft of the table.

3. "Come and get a pencil and paper." The child was to walk to the teacher's desk and pick up a pencil and piece of paper or be in line to get the pencil and paper within the 15-sec time limit.

4. "Write your name on the paper." The child would print her complete first name in any location on the paper she had obtained from the teacher's desk.

5. "Fold your paper." The child would fold the piece of paper with her name written on it so that it covered approximately one-half the area it did before being folded.

6. "Bring the pencil and paper to my desk." The child was to place the pencil and piece of paper on the teacher's desk or be in line to place them on the desk within the 15-sec time limit.

7. "Put your chair on the table." The child would pick up her chair from the floor, turn it upside down, and place the seat of the chair on top the table with the back hanging off the table so that the chair would remain on the table when it was no longer supported by her.

8. "Get your mat out." The child would lift her mat from the shelf of the steel cabinet and remove it to any location outside of the cabinet.

9. "Lie down." The child was to be in a horizontal position any place on the floor of the room.

10. "Be quiet." There were to be no voice or throat sounds or any sounds made with the hands or feet for 15 sec after the instructions.

Procedures

The students were brought into the classroom at 12:30 p.m. each day after the noon recess. They were first told that they could play for 5 or 10 min. At the end of this period of free-play the teacher began giving the instructions in the order listed. Generally, each instruction was given only once for the entire group of children with a 2-min interval between successive instructions.

The sequence in which the instructions were given and the timing of instructions approximated a normal classroom procedure. The children got out sufficient toys during free play that there was always a toy for every child to pick up. The free play and the picking up of toys insured that none of the children were sitting when they were told to sit down. Once a child had a pencil and piece of paper, she would generally draw some simple picture or print letters during the time she had the paper, *etc.*

These general procedures were maintained for 20 daily sessions with each session lasting for about 20 min. After the tenth session, the teacher volunteered that an occasional exception to the general procedures had been made. This exception was a repetition of certain instructions when, in the teacher's opinion, the children may have been making so much noise that they could not hear the instruction. The teacher was not sure but thought that she had made this exception for three individual instructions. She did not remember on which days she had repeated the instructions or which instructions were involved. The possibility that this exception could have an effect on the children's responses was explained and the teacher was asked to avoid repeating instructions even if they might not have been heard by the children. On frequent subsequent checks, the teacher indicated that all instructions were presented exactly once each day.

Recording

For each session of the experiment, the teacher was equipped with a stopwatch and a score sheet that listed the 10 instructions and each student's name. The stopwatch was used to time the interval beginning with the presentation of an instruction and ending 15 sec later and the interval beginning with an instruction and ending 2 min later when the next instruction was presented. The teacher recorded an "X" on the score sheet for a student if the student emitted the appropriate response within 15 sec after an instruction. If the appropriate behavior did not occur, or occurred later than 15 sec after the instruction, an "O" was recorded.

To determine the extent to which the data could be reliably recorded, an observer, who had been familiarized with the instructions and the response criteria, sat in the classroom during three separate sessions and independently scored each student's responses for each instruction. This observer was similarly equipped with a stopwatch and score sheet. One reliability check was taken during the condition named below as Contingent Teacher Attention I, another during Baseline II, and the third during Contingent Teacher Attention II. Percent agreement was computed as number of agreements divided by the total number of possible agreements. The per cent of agreement for these three sessions was 97.5, 94, and 100 respectively. The total number of possible agreements was 40, 50, and 40 respectively.

Experimental Conditions

Two different experimental conditions were employed during the experiment and each condition was scheduled twice. The only difference between the two conditions was the extent to which the teacher interacted with the children and the circumstances under which these intractions occurred.

Baseline I

Throughout the sessions under this condition, the teacher, except for giving the instructions, spoke to the children only if asked a direct question; she in no way responded differentially to the children when they followed or failed to follow an instruction. This condition was in effect for the first five sessions of the experiment.

Contingent Teacher Attention I

During this condition, the teacher differentially attended to each student in the class who emitted the appropriate criterion response within 15 sec after an instruction. This attention consisted of the teacher's emitting some natural verbal response such as: "My, aren't you good today, Lidia?", "That's nice!" or "Thank you for doing what I asked, Rhoda!" Occasionally, the teacher would touch or pat the child on the head while talking to her. In all cases, the teacher tried to attend to or praise the children while the criterion responses were occurring or as soon after the response occurred as was practical. This condition was in effect from Session 6 through Session 11.

Baseline II

During Sessions 12 through 16, conditions identical to those employed during Baseline I were in effect.

Contingent Teacher Attention II

Attention was again given each child whenever she followed one of the teacher's instructions. This condition was in effect for the last four sessions.

RESULTS

Figure 1 displays the mean per cent of instructions followed by the children present on a given day. Each data point was obtained by dividing the total number of instructions followed by the children on that day by the total number of opportunities to follow instructions. For example, during Session 1, the five children followed instructions 37 times out of the 50 possibilities; a mean of 74% of instructions followed.

During Baseline I, the daily mean per cent of instructions followed varied between 42.5 and 74. The mean of these daily means was 60%. There were no obvious trends present in the data during this condition.

When the teacher began attending to the children whenever they followed an instruction, Sessions 6 through 11, the mean per cent of instructions followed on each day increased abruptly. The mean over sessions during this condition was 78%. The daily means varied from 72 to 85%. The average mean percentage of instructions followed during this condition was 30% greater than the average mean percentage during the first baseline condition.

When the teacher no longer attended to the student's instruction-following behaviors, from Sessions 12 through 16, the mean per cent of instructions followed decreased to 68.7. The daily means varied between 60 and 70%. There is a slight suggestion of a downward trend in the percentage of instructions followed for the five days during Baseline II.

When the teacher again began attending to the children when they followed instructions, the daily mean per cent of instructions followed varied between 80 and 90. The average mean percentage for this condition was 83.7. This was 39.5% greater than in Baseline I and 21.9% greater than in Baseline II.

The mean percentage of instructions followed by the individual students during the four experimental conditions is shown in Fig. 2. One of these data points represents the total number of instructions followed by the indicated student during that particular con-

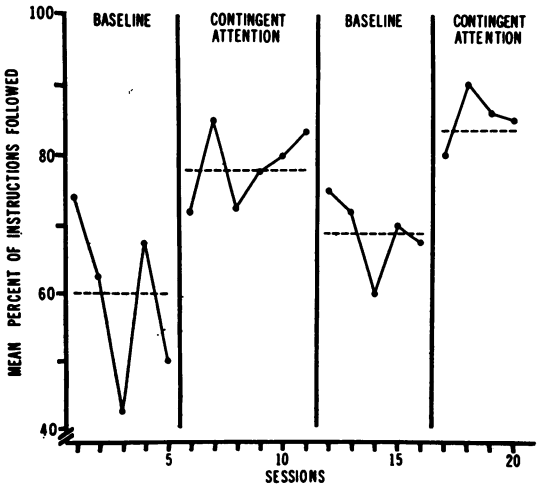

Fig. 1. The daily mean per cent of instructions followed by all subjects for each session. The horizontal dashed line under each condition shows the mean per cent of instructions followed for all observations within that condition.

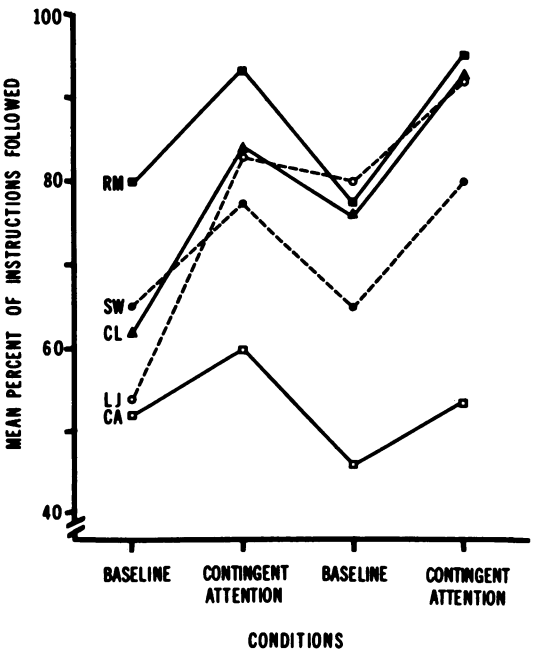

Fig. 2. The mean per cent of instructions followed in each condition for each of the five subjects, C.L., C.A., L.J., S.W., and R.M.

dition, divided by the number of opportunities to follow instructions.

These individual data are generally qualitatively consistent with the group data displayed in Fig. 1. For four of the subjects, R.M., S.W., C.L., and C.A., the mean percentage of instructions followed during the two conditions in which the teacher attended to the children when they followed instructions is clearly higher than the percentage during the two baseline conditions. For the fifth student, L.J., this relationship also holds, but the difference in the percentage of instructions followed during the first contingent attention condition is only slightly greater than the percentage during the second baseline condition.

Student absences from school were not differentially correlated with changes in the experimental conditions. C.L. was absent from Session 11, C.A. from Session 19, L.J. from Session 20, S.W. from Sessions 4, 7, 8, 16, and 18, and R.M. from Sessions 2, 3, 5, 9, 10, 11, and 12. Therefore, the group data could not be deceptively biased by the differential presence during contingent attention conditions of children who followed a large percentage of the instructions given by the teacher.

DISCUSSION

This research repeated the frequent finding that teacher attention is an effective positive reinforcer for the behaviors of preschool and elementary school children (Hall, *et al.* 1968; Thomas, *et al.* 1968; Madsen, *et al.* 1968; and Ward and Baker, 1968). More importantly, contingent teacher attention reliably increased the probability that every child in this study followed the teacher's instructions.

The practical importance of these findings is potentially great. A teacher faced with students who are difficult to manage or who fail to follow instructions related to academic work may substantially improve her instructional control by simply attending to the students at appropriate times.

Some limitations to the application of the present study should be noted. The present study used normal, preschool children as subjects and generalization to classrooms with older or non-normal subjects should be done cautiously pending further study. For some children, social attention may not be reinforcing. Lovaas, Freitag, Rubenstein, Schaffer, and Simmons (1966) observed this to be true of some autistic children.

It is also possible that peers can exert considerable control over the behaviors of individual students. It was casually observed in the present study that students would urge a slower student to hurry even though there was no apparent reinforcement for doing so. Such interactions could exert control over the instructed behaviors. At this time it is not clear whether such peer interaction would serve as aversive stimuli, which a student might escape by following instructions, or reinforcing stimuli, which would strengthen a student's not following the instructions. Therefore, it is possible that peer interactions could either support or hinder a teacher's instructional control.

The instructions in the present study were employed as discriminative stimuli to occasion desired behaviors. Madsen, Becker, Thomas, Koser, and Plazer (1968), however, showed that instructions also have reinforcing properties and could cause an increase rather than a decrease in undesirable behaviors, which they frequently follow. Thus, it is possible that instructions should not be given when undesirable or competing behaviors are occurring.

Previous research has similarly substantiated the casual observation that instructions may exert some control over the behaviors of a variety of human subjects (Zimmerman, *et al.* 1969; Ayllon and Azrin, 1964; Hopkins, 1968; and Findley, 1966). However, in all of these studies, and in the present research, the permanence and magnitude of the control is dependent on the extent to which appropriate consequences follow the instructed behaviors.

REFERENCES

Ayllon, T. and Azrin, N. H. Reinforcement and instructions with mental patients. *Journal of the Experimental Analysis of Behavior,* 1964, **7,** 327-331.

Buell, Joan; Stoddard, Patricia; Harris, Florence, R., and Baer, D. M. Collateral social development accompanying reinforcement of outdoor play in a preschool child. *Journal of Applied Behavior Analysis,* 1968, **1,** 167-173.

Findley, J. D. Programmed environments for the experimental analysis of human behavior. In W. K. Honig (Ed.), *Operant behavior: areas of research and application.* New York: Appleton-Century-Crofts, 1966. Pp. 827-848.

Hall, R. V., Lund, Diane, and Jackson, Deloris. Effects of teacher attention on study behavior. *Journal of Applied Behavior Analysis,* 1968, **1,** 1-12.

Hopkins, B. L. Effects of candy and social reinforcement, instructions, and reinforcement schedule leaning on the modification and maintenance of smiling. *Journal of Applied Behavior Analysis,* 1968, **1,** 121-278.

Madsen, C. H., Becker, W. C., and Thomas, D. R. Rules, praise, and ignoring: elements of elementary classroom control. *Journal of Applied Behavior Analysis,* 1968, **1,** 139-150.

Peckenpaugh, Adah. The teacher and preventive discipline. *NEA Journal,* 1958, **47,** 372-373.

Reynolds, Nancy J. and Risley, T. R. The role of social and material reinforcers in increasing talking of a disadvantaged preschool child. *Journal of Applied Behavior Analysis,* 1968, **1,** 253-262.

Madsen, C. H., Becker, W. C., Thomas, D. R., Koser, Linda, and Plager, Elaine. An analysis of the reinforcing function of "sit-down" commands. In R. K. Parker (Ed.), *Readings in educational psychology.* Boston: Allyn and Bacon, 1968. Pp. 265-278.

Skinner, B. F. *Verbal behavior.* New York: Appleton-Century-Crofts, 1957.

Terrace, H. S. Stimulus control. In W. K. Honig (Ed.), *Operant behavior: areas of research and application.* New York: Appleton-Century-Crofts, 1966. Pp. 271-344.

Thomas, D. R., Becker, W. C., and Armstrong, Marianne. Production and elimination of disruptive classroom behavior by systematically varying teacher's behavior. *Journal of Applied Behavior Analysis,* 1968, **1,** 35-45.

Ward, M. H. and Baker, B. L. Reinforcement therapy in the classroom. *Journal of Applied Behavior Analysis,* 1968, **1,** 323-328.

Zeilberger, Jane; Sampen, Sue E., and Sloane, H. N. Modification of a child's problem behaviors in the home with the mother as therapist. *Journal of Applied Behavior Analysis,* 1968, **1,** 47-53.

Zimmerman, Elaine H., Zimmerman, J., and Russell, C. D. Differential effects of token reinforcement on instruction-following behavior in retarded students instructed as a group. *Journal of Applied Behavior Analysis,* 1969, **2,** 101-112.

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