THE EFFECTS OF TOKEN PROCEDURES ON A TEACHER'S SOCIAL CONTACTS WITH HER STUDENTS¹

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The effects of a token system on a teacher's rate of social contacts with her students were investigated in a public school kindergarten. A group of six children were observed daily during a 20-min handwriting lesson. The children were divided into two groups (A and B) of three children each. Five conditions were imposed sequentially: (1) baseline without tokens, (2) contingent tokens for Group A, noncontingent tokens for Group B, (3) contingent tokens for Group B, noncontingent tokens for Group A, (4) reinstatement of condition 2, and (5) contingent tokens for both groups. It was consistently observed that the teacher's rate of social contact was higher with the children receiving the contingent tokens than with those who received noncontingent tokens.

A number of recent studies have reported the effects of token systems on the classroom behavior of students. O'Leary and Becker (1967) introduced a token reinforcement program in a third-grade adjustment class for emotionally disturbed children. McKenzie, Clark, Wolf, Kothera, and Benson (1968) used grades as tokens with eight children in a learning disabilities class. Wolf, Giles, and Hall (1968) found beneficial effects when token procedures were used with fifth- and sixth-grade children in an after-school remedial classroom. Bushell, Wrobel, and Michaelis (1968) used token procedures to maintain the study behavior of 12 children in a preschool class.

As the instances of classroom token systems increase, it becomes more important to know what, if any, effects token procedures have on teachers' behavior. This study attempted to determine what effects a system requiring the contingent delivery of tokens would have on a teacher's social contacts with her students.

METHOD

Subjects and Setting

The study was carried out in the regular afternoon kindergarten class of Woodlawn Elementary School in Lawrence, Kansas. The group selected for study consisted of three males and three females whose ages ranged between 5 yr, two months and 5 yr, six months at the start of the study. The teacher was a woman with 21 yr of classroom experience.

The six children and the teacher were seated around a small rectangular table each school day for a 20-min handwriting session. The other 18 children spent the same period working on the same materials under the supervision of a teacher's aide and two parents.

Recording Procedure

An observer, seated near the table where the children were working, kept a record of each time the teacher contacted one of the six children. Each contact was recorded by noting the name of the child contacted and every contact was recorded in the order of its occurrence. A teacher contact was defined as: "A verbal statement directed to a child: (1) by name, and/or (2) while in face-to-face orientation with the child, and/or (3) while touching or looking at the materials in front of the child". A teacher response that met one or more of these three conditions was recorded as a contact.

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Touches, smiles, laughs, exclamations such as "hmmm", and speaking to more than one child at a time were not recorded as contacts. These were conceivably relevant behaviors, but it was not possible to arrive at any reliable method for their measurement.

Video tapes were made of 36 of the 40 sessions. The camera and microphone were placed in the room and remained fixed and unattended throughout the four months of the study. The monitor and recorder were located across the hall in another room so that there was no feedback into the classroom to indicate when this equipment was in use. The tapes were later viewed by a second observer who also recorded teacher contacts according to the stated definition. There was no contact between observers beyond the specification of the response definition; neither knew of the other's results until the study was completed. Agreement of the two observers' records was assessed, observation by observation. The percentage of agreement was obtained by dividing the number of agreements by the number of agreements plus the number of disagreements, and multiplying by 100.

Token Procedures

Throughout the study, tokens, in the form of poker chips, were dispensed by the teacher. In the non-contingent presentation condition, the teacher gave a child 10 tokens at the start of the session. No further tokens were given during the session. In the contingent presentation condition, the teacher gave tokens throughout the session for correct writing responses. In both the non-contingent and contingent conditions the tokens were dispensed into a cup placed in front of each child. At the end of the 20-min handwriting period, the tokens were exchanged for a variety of activities such as gym, special games, walks, stories, and a cookie at snack time.

Baseline. No tokens were dispensed during the first nine days of the study. The teacher was asked to behave as she normally would, *i.e.*, to give praise and individual help to the children as they worked.

Contingent tokens for Group A. At the end of the ninth session, the baseline data were examined in order to divide the data on the six children into two sets of three, each of which showed approximately the same number of contacts during the first phase of the study.

The teacher was then asked to continue conducting the lessons just as she had been, except now she would give three of the children (Group A) tokens for their correct responses as they worked. The other three children (Group B) were given 10 tokens each at the start of the session. The seating arrangement at the table remained unchanged and there was no physical separation of the two groups. (The group designations were used only by the experimenters. The children were always referred to by name when discussing procedure with the teacher.) It was emphasized that in all respects other than the tokens, the teacher should continue to give her attention and help to all of the children just as she had during the previous nine days.

Contingent tokens for Group B. Before the sixteenth session the teacher was asked to give tokens to the three children of Group B for their correct responses and to give the other three children 10 tokens each at the start of the session. This procedure was continued for eight sessions.

Reinstatement of contingent tokens for Group A. Before Session 24, the teacher was asked to return to the original practice of giving the children of Group A tokens as they worked and giving the children of Group B ten tokens at the start of the session.

Contingent tokens for Group A and Group B. During the last nine days of the study, all children were given tokens contingent on correct responding and none of the children received any tokens at the start of the session.

RESULTS

Inter-observer agreement, computed by comparing the on-the-scene observer's record with that taken from video tape, averaged 89% for 36 sessions. (The first four sessions were not video taped.) Agreement of 90% or better was obtained for 22 of the sessions.

The main findings of the study are summarized in Fig. 1. During baseline, the average contacts to each group similarly describe a slightly decreasing rate over the nine sessions. When asked to deliver tokens to Group A contingent on their performance, there was an immediate increase in the teacher's contacts to Group A, even though there was no immediate change in her rate of contacting Group B. Over the six sessions of this condition, how-

Fig. 1. Average teacher contacts per session per child for Group A and Group B.

ever, there was a systematic decrease in the rate of contacts to B, while the average number of contacts to Group A remained consistently above baseline.

In subsequent phases of the study, the teacher's contact with the children followed the experimental manipulations, increasing toward a "contingent" group and decreasing toward a "non-contingent" group.

The average number of contacts with a group did not overlap in phases of the study where different procedures were used. The contacts with a group were always more numerous when it was receiving contingent tokens. Further, there were only three cases of overlap in the number of contacts with individual children under different treatments: contacts with S_1 of Group B were more than with S_6 of Group A during Session 11; during Sessions 19 and 21, the number of contacts with S_5 of Group A fell within the range of contacts with Group B children; during Session 25, the number of contacts with S_4 of Group A was equal to those with S_3 of Group B. Figures 2 and 3 show that the experimental manipulations had consistent effect on the teacher's contacts with each individual child and equally consistent effect with the groups as a whole.

Figure 1 shows teacher contacts that involved the delivery of tokens as well as those that were non-token contacts. Figure 4 breaks the teacher's contacts into their component parts. While most of the changes in the amount of contact with the two groups was accounted for by the token component, there were small but systematic changes in the non-token contacts as well.

DISCUSSION

The principal and repeated finding of this investigation was that the procedure of having the teacher distribute tokens as the children worked systematically altered her attending behavior.

Several interpretations of these results are possible, and a preference for one will be established only by additional research. One possibility is that the accumulating tokens in each child's cup exerted discriminative control over the teacher's attending behavior. A child with insufficient tokens would not be able to participate in the subsequent back-up activities, and an excluded child constitutes an unpleasant situation for most teachers. The children who received an adequate supply of tokens noncontingently at the start of the session offered no such potential consequence for her

Fig. 2. Teacher contacts per minute for individual children in Group A. Missing points indicate absences.

Fig. 3. Teacher contacts per minute for individual children in Group B. Missing points indicate absences.

Fig. 4. Average token contacts compared to average non-token contacts per child per session under each experimental condition.

relative inattention. If it is true that a small number of tokens serves to prompt increased teacher attention, it remains to investigate whether an opaque enclosed receptacle for the tokens would reduce the effects observed in the present study.

This interpretation is consistent with the fact that the teacher's overall rate of contact to the entire group was not increased during the final phase of the study. Comparable rates of teacher attention to all children during the final phase resulted in each child having an equal opportunity to participate in the back-up activities. Within the range of prices that prevailed throughout this study (about 10 tokens) the teacher's normal (baseline) rate of attention was sufficient to insure adequate token supplies to all six children. Presumably, an absolute increase in the overall rate of teacher contacts would be achieved by a marked increase in the prices of the back-ups. The manipulation of total rates of teacher contact remains for future study.

A second possibility is that the presentation

of tokens served to increase the number of correct writing responses produced by the children. A greater number of correct responses would provide more opportunities for the teacher to contact the children with praise and additional tokens. This interpretation would be strengthened to the extent that it could be empirically demonstrated that the children receiving contingent tokens did produce more correct responses (provide more opportunities for additional contact). This question is the subject of a concurrent study by Brigham, Finck, Breunig, and Bushell.

In either case, a procedure involving the contingent delivery of tokens appears to bring contingencies to bear on teachers' behavior beyond those that result from instructions such as, "Be sure to praise the children for their good work." It is this finding that may recommend the use of token procedures as a teacher training strategy in addition to their use for improving student motivation.

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