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The Effects of Individual Verbal Training Versus Group Verbal Training Upon Preschooler's Corresponding Snack Selection

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THE EFFECTS OF INDIVIDUAL VERBAL TRAINING
VERSUS GROUP VERBAL TRAINING UPON PRESCHOOLER'S
CORRESPONDING SNACK SELECTION

by

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THE EFFECTS OF INDIVIDUAL VERBAL TRAINING
VERSUS GROUP VERBAL TRAINING UPON PRESCHOOLER'S
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John W. Hoedl, M.A.
Western Michigan University, 1981

The purpose of this study was to compare group correspondence training with individual correspondence training. Groups of individually-trained and group-trained preschoolers were observed for their selection of specific snack items (fruit). First, they were trained to say they would select fruit. Then, social reinforcers were used to attempt to reinforce correspondence. Next, tangible reinforcers were contingent upon correspondence. The Group-Trained Tangible Reinforcement Phase proved the most successful and was replicated across the other groups.
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John W. Hoedl
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CHAPTER I

Introduction

The present study contrasted the acquisition of correspondence behavior between preschoolers trained in a group and preschoolers trained individually. Correspondence refers to a non-verbal response which occurs prior to a verbal response that correctly describes it, or to a non-verbal response which occurs after a verbal response that predicted its occurrence. Correspondence between verbal stimuli and non-verbal behavior has been demonstrated in a number of studies (Blackwood, 1970; Israel and O'Leary, 1973; Karoly and Dirks, 1977; Lovaas, 1961; Lovaas, 1964; Meichenbaum and Cameron, 1973; Meichenbaum and Goodman, 1969; Monohan and O'Leary, 1971; O'Leary, 1968; Risley and Hart, 1968; Robin, Armel and O'Leary, 1975; Rogers-Warren and Baer, 1976; Sherman, 1964).

Israel and O'Leary (1973) and Karoly and Dirks (1977) both contrasted "do-say" paradigms with "say-do" paradigms. Both students demonstrated that correspondence behavior is obtained faster when the verbal behavior occurs before the non-verbal behavior. The Israel and O'Leary (1973) study involved groups of children predicting subsequent or describing past free-play behaviors. Snack was placed contingent upon the content of correct verbal behavior and later only upon correct correspondence. Correspondence occurred only when reinforced and occurred more rapidly for the "say-do" group. The present study is similar in that it will also reinforce content, then
correspondence.

The Karoly and Dirks (1977) study differs from the Israel and O'Leary (1973) study only in that the dependent variable in the Karoly and Dirks study, arms held perpendicular to the body, would not in itself produce reinforcement while the dependent variable in the Israel and O'Leary study, specific types of free-play, would. The results again demonstrated that the "say-do" format was more useful in training correspondence than was the "do-say". Like the Karoly and Dirks study, the present study will involve a non-verbal response, selection of fruit over junk food, which by itself would occur at a very low rate. The present study will also use the "say-do" format.

Monohan and O'Leary (1971) analyzed the effects of self-instruction on rule breaking across different time delays. In a group comparison design, kindergarteners and first graders were taught to repeat a rule about when to press a button. They were taught to repeat this rule when a buzzer sounded. The buzzer would go off either 9 seconds or 2 seconds before the opportunity to press. Tokens were always contingent upon pressing, whether pressing followed the rule or not. There was no difference in appropriate button pressing between the 9-second group and the 2-second group. Unfortunately, data were only taken from one 15-minute session, and all conclusions had to be derived from group-summarized data.

Sherman (1964) conducted a simple ABA design study to demonstrate the effects of reinforcing verbal statements upon corresponding non-verbal behavior. Twenty five-year-olds were observed during two free-play situations for their interactions with certain
play materials. Between these two free-play sessions, a puppet praised and gave candy contingent upon the children's verbalizations which referred to specific play materials. (It is not clear what defined an appropriate verbalization.) In the following play session, a significant increase was observed in the use of the target materials. Post-treatment measures were taken from only one play session.

An earlier study by Lovaas (1961) is very similar to that done by Sherman. The major improvement in the Lovaas study was that it used a simpler dependent measure, lever pressing. Nineteen preschoolers were divided into two groups. Both groups talked to two dolls. The dolls reinforced one group with trinkets for aggressive verbalizations; the other with trinkets for non-aggressive verbalizations. Then, subjects in both groups were observed for 4 minutes to assess their engagement with two toys. Both toys were operated by a lever which facilitated measurement. Operation of the lever on one toy made two dolls strike each other, while operation of the lever on the other toy made a ball go up and down. Even though a group comparison design was used, the results were significantly in favor of reinforced aggressive verbalizations leading to aggressive non-verbal behavior.

Another study by Lovaas (1964) is quite similar to the two just mentioned (Sherman, 1964; Lovaas, 1961) in that Lovaas used a hand puppet to reinforce preschoolers' verbalizations. The dependent measure in the Lovaas study was weight of specific snack foods consumed. Snack was given in the first phase. Children had a choice of
four foods. The weight of each type they consumed was tabulated. After several days, the next phase began. Subjects observed the puppet who prompted them to say the name of one of the foods. Verbalizations of the food name were reinforced with trinkets. Snack consumption continued to be measured following this phase. Preschoolers consumed significantly (at the .00001 level) more of the target foods than in the previous consumption phase. This study differed from the present one in that the present one generated a verbal response in which the child indicated that he/she would take a certain food, while the Lovaas (1964) study only reinforced children for verbalizing the name of a food. They were not required to say anything about selecting it later.

The Lovaas (1964) study is very similar to the present one in that the dependent measure involves children's selection of a specific snack. Unfortunately, the Lovaas (1964) study lacked a rigid experimental design, as did the Monohan and O'Leary (1971), Sherman (1964), and Lovaas (1961) studies. The present study will improve upon this through the use of a multiple baseline across groups design. Multiple baseline designs were used by Risley and Hart (1968) and by Rogers-Warren and Baer (1976) and the data reported from these studies were both easier to interpret and more believable. However, the correspondence format used in both these studies was "do-say". The present study is novel in that it used a multiple baseline design to assess correspondence in a "say-do" format.

Israel and Brown (1977) contrasted two procedures for generating correspondence. In one procedure, the experimenter reinforced the
occurrence of just the verbal behavior, then later the correspondence itself, while the other reinforced the correspondence directly. In both cases, reinforcement of the correspondence was necessary. This study is unique in that it was the only one reviewed that identifies the necessity of reinforcement for correspondence to occur.

Several studies reported correspondence which resulted from reinforcement of either verbal behavior or non-verbal behavior alone (Karoly and Dirks, 1977; Lovaas, 1961; Lovaas, 1964; Meichenbaum and Goodman, 1969; O'Leary and Israel, 1973; Risley and Hart, 1968; Rogers-Warren and Baer, 1976; Sherman, 1964). In all cases, such findings either quickly disappeared (Karoly and Dirks, 1977; Lovaas, 1964; O'Leary and Israel, 1973; Risley and Hart, 1968; Rogers-Warren and Baer, 1976), or no further data were taken (Lovaas, 1961; Meichenbaum and Goodman, 1969; Sherman, 1964). Such effects could be of very little applied significance. Research in creating correspondence should be concerned with reinforcing the entire correspondence, in other words, supplying the third term in the three-term contingency (which is reinforcement). The idea of "training to allow control of less accessible non-verbal behavior by randomly monitoring the corresponding verbal behavior..." (Israel, 1978, p. 276) has definite technological implications, but the literature reviewed here has shown that it cannot be if we do not first reinforce the correspondence itself. The present study will identify the variables responsible for reinforcing and maintaining the correspondence.

In summary, the contributions of this study are to do the following:
1) Determine whether correspondence can more readily be attained by training children in a group or individually.

2) Demonstrate "say-do" correspondence via a rigid experimental design.

3) Specifically identify the variables responsible for such correspondence.
CHAPTER II

Method

Subjects

The subjects were 3 three-year-olds and 16 four-year-olds (9 males and 10 females). They all received Direct Instruction in math, reading and language. All of the subjects had previously consumed the foods used in this study.

Setting

The study was held in a preschool classroom. The room was divided into four separate areas, three for eating and one for recreational activities. Hallway space outside of the room was used for training to eliminate the possibility of children viewing the training of another group. Groups received snack in different eating areas. Strategic placement of furniture eliminated observation of selection activities by children in the other groups.

Procedure

Measurement procedures. Throughout the study, the same foods were presented at each snack time. Each child was allowed to choose one of six different snack items except Subject 19 who was allergic to oranges. A teacher's aide presented all six items on a single tray to each child, one at a time. Before they could select their snack, the aide required each child to correctly perform the
instruction, "Point to the side of the tray that is fruit," or, "Point to the side that is not fruit." (Aides were told to use either instruction randomly and occasionally use both.) Children were then allowed to take the item they wanted. Children were not allowed to eat until all the children in their group had selected a food item. Children remained in their seats until all children in the room finished eating. Each snack time constituted one session, and there were two snack sessions daily. The study lasted approximately four months for 106 sessions.

The behavior of interest in this study consisted of each child's selection of snack. Selection consisted of physically removing one type of food from an array of six types (three fruit and three less nutritional). The items were: two quarters of an orange, two quarters of an apple, two pieces of a banana (approximately three inches long), two Oreo cookies, one Twinkie cut into two pieces, and one pretzel rod broken into two equal pieces. The different foods were placed on separate plates and presented on a tray. The fruit items were placed on one side of the tray, while the less nutritional items were placed on the other. An aide placed a check by each child's name under the proper food column. Another aide matched the list to the actual food in front of each child in an accuracy check. If a mistake was discovered, both aides and a third aide who distributed the food, corrected it.

Experimental design. Nineteen preschool children were blocked into two groups according to age and whether they attended school mornings or all day. Both these groups were randomly assigned in
equal numbers to one of these conditions: group training, individual training, or no training.

The experimental design will consist of both a within-subjects design, and a between-subjects design. The within-subjects design is a between-subjects comparison. Each subject was exposed to four conditions: baseline, content training, peer or adult reinforcement, and tangible reinforcement. The third phase consisted of peer reinforcement for the group-trained group, and adult reinforcement for the individually-trained group.

A between-subjects design was used to contrast the correspondence behavior of the individually-trained group with that of the group-trained group. In addition to this comparison, the condition that demonstrated the greatest degree of correspondence in either the individually-trained or the group-trained group was replicated in the other group as well as the control group. This procedure gave the advantage of a multiple baseline design across subjects and also ruled out order and sequence effects.

**Experimental conditions**

**Baseline.** During baseline conditions, no training was provided. Each child was offered the food tray, and his/her choice was recorded.

**Content.** This phase differed from baseline in that, immediately prior to selection, children in both the group-trained and individually-trained groups were taught to say that they would choose fruit. The group-trained children were taken into the hallway as a group and trained simultaneously, while the individually-trained children were
taken into the hallway and trained one at a time. In both conditions, children made their selections within five minutes after training. The training involved the use of the following scripted lesson:

**Teacher's Script:**

1. Everybody, you're going to take fruit. What are you going to take?  
**Children's Correct Response:** Fruit

2. What are you going to take?  
**Fruit**

3. Are you going to take fruit?  
**Yes**

4. What are you going to take?  
**Fruit**

5. Say the whole thing!  
**I am going to take fruit.**

6. ___ all by yourself, say the whole thing. (The teacher repeated this for each child in an individual turn.)

**I am going to take fruit.**

The same script was used for both the individually-trained group and the group-trained group. Any errors made were corrected using Engelmann's (1980) model, lead, and test format. This format involved the experimenter modeling the correct response, saying it with the children, and then testing them on it by repeating the task.

**Peer reinforcement.** This differed only slightly from the Content Phase. The only change was the addition of another scripted lesson which was designed to teach peer control in the group-trained group only. This lesson occurred as a continuation of the lesson used in the Content Phase.

**Example:**

**Teacher Script:**

None  
If someone takes fruit, you say, "Yeah." What do you say if someone takes fruit?

**Children's Correct Response:** Yeah.
None  What do you say        Yeah
if someone takes fruit?

None  Do you say anything    No
if they don't take fruit?

None  What do you say if
someone takes fruit?

None  Watch me. I'm going
to fool you. I'll be
the kid. I'll either
take fruit, or I won't
take fruit. If I take
fruit, you say, "Yeah."
If I don't take fruit,
you don't say anything.
Here I go! (The teacher
then takes a tray from
behind his back and
models six selections of
food in random order, such
as:

Fruit          Yeah
Fruit          Yeah
Not fruit      Children say nothing.
Fruit          Yeah
Not fruit      Children say nothing
Not fruit      Children say nothing

Again, any errors were corrected via the Engelmann model, lead and

During selection, a tape recorder was used to determine if group-
trained children said, "Yeah" contingent upon another child's selec-
tion of fruit. Peer reinforcement was said to occur if at least
one child said, "Yeah" during a session. This method was used for
two reasons. First, it was very difficult to determine how many
children were speaking at once on a cassette tape. Second, when one child emitted the response, "Yeah", the others almost always followed suit.

**Adult reinforcement.** This phase was for the individually-trained group and differed from the Content Phase by the addition to the content lesson of the teacher's statement, "I'm going to watch you."

Another major difference occurred during selection. The teacher stood next to each child as he/she selected, and, if they chose fruit, the teacher would say, "You chose fruit. Good job, (name)!"

While each child was praised, the teacher patted him/her on the back.

**Tangible reinforcement.** This phase differed from the Peer Reinforcement Phase and the Adult Reinforcement Phase by the addition of the following script to the training:

**Teacher Script:**

<table>
<thead>
<tr>
<th>Children's Correct Response:</th>
<th>Teacher Script:</th>
</tr>
</thead>
<tbody>
<tr>
<td>A placemat to color.</td>
<td>Children's Correct Response:</td>
</tr>
<tr>
<td>What do you get if you take fruit?</td>
<td>A placemat to color.</td>
</tr>
</tbody>
</table>

Before each child selected his/her snack, an array of three different placemats was placed in front of the child on the table. Placemats consisted of different dittoed cartoon characters stapled to colored construction paper. If a child chose fruit, an aide would say, "Since you did what you said you were going to do, you get a placemat.

Which one do you want?" The child then received the placemat to which he/she pointed. If a child did not choose fruit, the aide said, "Since you didn't do what you said you were going to do, you don't get a placemat." After the entire group selected food, a bowl of crayons was set on the table. Children who did not choose fruit
were not allowed to color. Children were required to remain in their seats until five minutes after the last child in the group had finished eating.

Previous to this phase, all children had received daily a dittoed cartoon character to color after they finished eating. Coloring served to keep them in their seats. During the last six sessions of the Adult Reinforcement Phase and the Peer Reinforcement Phase, coloring deprivation was instituted. Children no longer received the dittoes. This was done to increase the reinforcing effectiveness of coloring in the Tangible Reinforcement Phase. In other words, it would be an establishing operation.

**Baseline 2.** Following the Tangible Reinforcement Phase, all groups experienced a second baseline. This condition is identical to the first baseline condition except that coloring deprivation was instituted for the first five sessions of the phase. This was done to enhance the reinforcing effectiveness of coloring in the subsequent Group-Trained Tangible Reinforcement Phase.

**Group-trained tangible reinforcement.** This phase was identical to the previous Tangible Reinforcement Phase with the group-trained group.

This condition went into effect for the control group immediately following the coloring deprivation, and went into effect for the individually-trained group 14 sessions later. (It should be mentioned that the individually-trained group and the control group were actually group-trained in this phase.) Subsequently, coloring deprivation did not occur prior to the implementation of the Group-Trained Tangible
Reinforcement Phase across the individually-trained group.
CHAPTER III

Results

Figure 1 shows the percentage of fruit selections for each group in each phase. Percentage of fruit selections was calculated by dividing the total number of fruit selections by the total number of selections and then multiplying by 100.

During the first baseline phase, the percent of fruit selection was between 5-10% for all three groups. During the Content Phase, the percent of fruit selection ranged from 20% for the group-trained group to 10% for the individually-trained group. The individually-trained group selected fruit in 34% of the selections under the Adult Reinforcement condition. The group-train group selected fruit in 8% of the Peer Reinforcement sessions, while at the same time, the control group also selected fruit in 8% of its sessions. During the Tangible Reinforcement Phase the percent of fruit selection increased to 99% for the group-trained group and to 52% for the individually-trained group and decreased to 1% for the control group. During the second baseline phase, the percent of fruit selection decreased to 32% for the group-trained group and to 0% for the individually-trained group and increased to 13% for the control group. Replication of the Group-Trained Tangible Reinforcement Phase across the control group produced 98% fruit selection, and replication across the individually-trained group produced 71% fruit selection.

Figure 2 shows the individual data from each session across all
Figure 1. Percentage of fruit selections for each group across each phase.
Figure 2. Individual food selections across all groups and conditions. A data point adjacent to the "F" indicates fruit selection, while a data point adjacent to an "N" indicates a non-fruit selection.
groups and conditions. Although the individually-trained group selected fruit in 34% of the sessions in the Adult Reinforcement Phase, from Figure 2 it can be seen that most of the fruit selections occurred in the early sessions of the phase. When the Group-Trained Tangible Reinforcement condition was replicated across the individually-trained group, fruit selection was 70%. From Figure 2 it can be seen that all of the non-fruit selections occurred in the early sessions of the phase, and that during the last six sessions only fruit was selected.

The peer reinforcement measure taken during the Peer Reinforcement Phase indicated that peer reinforcement occurred in only 8% of the sessions. In the Tangible Reinforcement Phase, it occurred in 84% of the group-trained sessions. However, when group-trained tangible reinforcement was in effect for the control group, peer reinforcement occurred in only 11% of the sessions, and when this condition went into effect for the individually-trained group, it occurred in no sessions at all.
CHAPTER IV

Discussion

As seen in Figure 2, the few subjects (Subjects 1 and 2) who chose fruit in the Content Phase did not do so for very long. Several studies also found that when the verbal behavior or the non-verbal behavior are generated alone, any observed correspondence quickly disappeared (Karoly and Dirks, 1977; Lovaas, 1964; O'Leary and Israel, 1973; Risley and Hart, 1968; Rogers-Warren and Baer, 1976). From a behavioral framework, this result is not hard to analyze. In the Content Phase, the children were required to say that they were going to choose fruit. For some, this may have been a discriminative stimulus. In other words, when they emitted correspondence behaviors in similar situations in the past (that is, they did what they said they were going to do), they were reinforced more often than not. However, since there was no reinforcement for correspondence in the Content Phase, fruit selections ceased to occur.

The group-trained Peer Reinforcement Phase produced no effect while the individually-trained Adult Reinforcement Phase produced only limited, short-lived effects (Subjects 8, 10 and 12). The secondary social reinforcement (praise) delivered by the adult contingent upon food selection apparently could not compete with the primary reinforcement of junk food consumption.

Only the condition of group-trained Tangible Reinforcement demonstrated a lasting effect. Since the peer reinforcement, "Yeah"
only occurred in the original Tangible Reinforcement Phase, peer reinforcement could not have been a variable responsible for the effect demonstrated in the group-trained Tangible Reinforcement Phases.

It should be noted further that the group-trained tangible reinforcement was more immediately effective when the subjects had been on color deprivation prior to the implementation of the phase. This effect was demonstrated when color deprivation did not occur prior to the implementation of the group-trained Tangible Reinforcement condition across the individually-trained group. Although at the end of the phase, all subjects were choosing fruit, such effects did not occur as rapidly as in the original group-trained group or the control group.

Group training was shown here to be more effective than individual training. It is also less time-consuming. The group-trained Tangible Reinforcement session took roughly forty seconds, while the individually-trained Tangible Reinforcement session took about three minutes.

The variables responsible for the correspondence appear to be the tangible reinforcement for correspondence in a group-trained situation. Why this effect was shown in a group-trained group and not in an individually-trained group is not clear. One recommendation of this study is that a component analysis of this group-trained condition be performed. Nothing in any of the training instructed children as to why they should choose fruit. It is possible that if the children were instructed that fruit was good for their health and/or that the other less nutritional foods were bad
for their health, this may have facilitated their selecting fruit. It would be interesting to compare the effects of such verbal training with those used in this study.

Another recommendation beyond the scope of this study would be to attempt to generate correspondence behavior that maintained in situations where reinforcement did not occur. This study demonstrated a method for attaining correspondence with a continuous schedule of reinforcement. The use of intermittent reinforcement is a possibility that should be examined.

One last suggestion would be to attempt to contrast correspondence-generated non-verbal behavior with that of direct contingency-shaped behavior. Now that correspondence behavior can be generated with the necessary contingencies to make it maintain, it would be worthwhile to determine if all the fuss over the preceding corresponding verbal behavior is of any use.


Israel, A. C. and Brown, M. S. Correspondence training, prior verbal training, and control of nonverbal behavior via control of verbal behavior. Journal of Applied Behavior Analysis, 1977, 10, 333-338.


