THE ROLE OF SUBJECT VERBALIZATION IN GENERALIZED CORRESPONDENCE

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We examined the role of subject verbalization in the generalization of verbal-nonverbal correspondence. Twelve kindergarten children underwent correspondence training (subject verbalization) or received reinforcement for performing an experimenter-selected behavior (experimenter verbalization). A reversal design, along with the introduction of a multiple baseline design across behaviors, was used to assess functional relations. Pupils who received correspondence training demonstrated greater generalization. Our findings suggest that subject verbalization may be necessary to accomplish generalized correspondence.

DESCRIPTORS: correspondence training, generalized correspondence, verbalization, kindergarten children

During correspondence training, subjects are prompted to state a behavioral intention (say) and receive differential reinforcement according to whether their subsequent behavior is consistent with that stated intention (say-do). Maintenance is demonstrated when say-do correspondence is no longer reinforced, but the subjects continue to perform the trained response when they say they will (Baer, Williams, Osnes, & Stokes, 1984; Guevremont, Osnes, & Stokes, 1986b; Israel & Brown, 1977; Osnes, Guevremont, & Stokes, 1986; Rogers-Warren & Baer, 1976; Whitman, Scibak, Butler, Richter, & Johnson, 1982). Generalized correspondence occurs when a subject performs a promised behavior that has not been systematically reinforced (Baer, Osnes, & Stokes, 1983; Baer, Williams, Osnes, & Stokes, 1985; Guevremont, Osnes, & Stokes, 1986a; Williams & Stokes, 1982).

What accounts for the relationship between statements of intention and subsequent behavior?

From one perspective, stated intentions are associated with verbal mediators that have self-instructional and self-regulatory functions (Israel, 1978; Israel & O'Leary, 1973; Lovaas, 1961; Luria, 1961; Whitman et al., 1982). Such mediators are also described as discriminative stimuli to which appropriate responses may be conditioned (Baer, Detrich, & Weninger, 1988; Stokes, Osnes, & Guevremont, 1987). The concept of self-regulation through verbal mediation suggests that subject verbalization is necessary for verbal-nonverbal correspondence.

In the context of studying rule-governed behavior (another form of self-regulation), questions arise about the importance of subject verbalization. When subjects systematically receive reinforcement, they may use situational cues to generate their own rules about the contingencies (Deacon & Konarski, 1987). For instance, the generalized correspondence rule states that subjects must do what they have said they will in order to receive reinforcement. Likewise, the discriminative correspondence rule holds that subjects must specify what they intend to perform, and, in fact, then perform a specific act in order to receive reinforcement. Subject verbalization may not be necessary for the generation of such rules. Baer

Appreciation is expressed to the administrators of the Pittsford Central School, Pittsford, New York, for their cooperation.

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et al. (1988) also questioned the role of subject verbalization. Although they did not rule out the influence of self-regulation, they concluded that verbalization may be necessary to elicit target behavior, but it may come from either the subject or the experimenter.

Thus, the role of subject verbalization in the relation between statements of intention and subsequent behavior remains somewhat unclear. In an attempt to clarify its role, we observed generalized correspondence among children who had received reinforcement for say-do correspondence or who had been provided with experimenter verbalizations and received reinforcement separately for saying and doing. We hypothesized that if subject verbalization was necessary to accomplish the verbal control of untrained behavior, only the children in correspondence training would show generalized correspondence. If subject verbalization was not necessary, or if verbalization from either the subject or the experimenter was sufficient, we would expect both groups to demonstrate generalized correspondence.

METHOD

Participants and Setting

With parental permission, 4 girls and 8 boys were selected randomly from a "young kindergarten" class in a suburban school district. Children enrolled in this class had achieved a developmental age of less than 4.5 years on the social, emotional, and motor scales of the Gesell School Readiness Screening Test (Ilg, Ames, Haines, & Gillespie, 1978) but were not considered to be in need of special education. None of the children presented with diagnosed verbal deficiencies. The children's ages ranged from 5 years, 2 months to 5 years, 9 months. Two girls and 4 boys were selected randomly for correspondence training, and the remaining children were assigned to a reinforcement condition.

For 1 hr each morning, one group of children worked on academics with the teacher, a crafts group met with an aide, and a free-play group engaged in a variety of play activities in the class-

room. The groups changed activities every 20 min, and the procedures were administered individually to 4 of the children during each play period. As each group's play period began, the children were asked to come individually to the experimenter's desk. The desk's location was remote from the play areas, and the children did not interact with the experimenter during free play.

Target Behaviors and Materials

We chose target behaviors in which the children infrequently engaged so that preexperimental play preferences would be unlikely to confound the experimental procedures. We observed the children's spontaneous play for 2 weeks prior to the study and found that, as a group, play at the workbench (carpentry toys) and at the free-choice table (fine-motor activities) never occurred. The workbench included a hammer, a saw, a wrench, a pair of pliers, a screwdriver, a vise, pieces of scrap wood, and a can of wood screws. Swatches of cloth (30 cm square) provided buttons, button holes, and zippers at the free-choice table. Large shoe laces and plastic shoes with large lace holes were also provided. In addition, the children had access to a jungle gym, a housekeeping and dress-up area, scooters, tricycles, building blocks, books, a sand table, and trucks.

A token reinforcement system required that the experimenter keep, for each child, a manila folder in which 33 squares (4 cm by 4 cm) had been drawn. The token reward was an inked impression of a puppy dog stamped into one of the squares. The tokens were exchanged for boxes of crayons.

Experimental Procedures and Design

The manipulations occurred during the first and last 30 s of a 5-min period of each child's 20-min play time. The following experimental conditions were in effect:

Baseline. Target behaviors were recorded with no child-experimenter interactions.

Reinforcement of verbalization (Rf V). The experimenter (first author) said, "Tell me you're going to play at the workbench (free-choice table) today." A complete statement by the child (e.g.,

"I am going to play at the workbench today") was prompted by the experimenter when necessary. The experimenter then said, "Because you said you were going to play at the workbench (free-choice table) today, I'm going to stamp your folder. Remember, when all the squares are stamped, you'll get one of these prizes." He pointed to several boxes of crayons on the desk and then said, "Now go ahead and play."

Correspondence training (CT). As indicated above, the child was prompted to state the intention of playing at the workbench. The experimenter then said, "Now, go ahead and play." After 4 min of play, the child was asked to return to the experimenter's desk. He or she was told, "You said you were going to play at the workbench, and you did, so I'm going to stamp your folder" or "You said you were going to play at the workbench, but you didn't, so I'm not going to stamp your folder."

Reinforcement (RF). The child was told, "You may earn a stamp in your folder, but I can't tell you what to play with. Now go ahead and play." After 4 min, the child was told, "I'm going to stamp your folder because you played at the workbench" or "I'm not going to stamp your folder because you didn't play at the workbench."

A reversal design, along with the introduction of verbal conditions in a multiple baseline design across behaviors, was implemented over a 38-day interval. The reversal occurred after the first reinforcement of verbalization condition (Rf V) for each of the dependent variables. The multiple baseline design was introduced the second time the child was given reinforcement for stating the intention of playing at the free-choice table (Rf V).

Data Collection and Reliability Assessment

Observations were recorded for the 4 min following the initial contact with a child. One or two observers attended to 1 child for 24 10-s intervals during each observation period. The first author served as the primary observer. A former kindergarten teacher who was naive to experimental hypotheses and conditions served as the secondary observer. Audiotaped signals transmitted from one electronic recorder cued both observers, who were

seated 7 m apart. Each observer placed a check mark on a data sheet for each interval in which the child played appropriately with the target object. Appropriate play was any goal-directed use of a toy, such as using a hammer to pound nails or to button, zip, or tie at the free-choice table. Merely touching, carrying, or holding the play objects was not considered to be appropriate. The appropriate play criterion was used to reduce measurement error that could occur with brief child-toy encounters. Of the 197 times the 12 children engaged target objects, 192 (97.5%) occurred during one of three or more consecutive intervals. Consequently, momentary touching of target objects was presumed not to have caused an overestimation of effects.

Interrater reliability during 46% of the sessions was calculated by dividing agreements by agreements plus disagreements and multiplying by 100. Levels of interobserver agreement on the occurrence of target behaviors across conditions were: workbench, 96%, and free-choice table, 92%. Levels of agreement on the occurrence of playing at the workbench, by condition, were: baseline, 100%; reinforcement of verbalization, 92%; correspondence training, 97%; and reinforcement, 98%. With free-choice table play, levels of agreement were 84% and 94% during baseline and reinforcement of verbalization conditions, respectively. Agreements on the nonoccurrence of target behaviors across conditions were: workbench, 99%, and free-choice table, 99%. For playing at the workbench, by condition, agreements of nonoccurrence were: baseline, 99%; reinforcement of verbalization, 99%; correspondence training, 97%; and reinforcement, 99%. Nonoccurrence agreements for free-choice table play, by condition, were baseline, 99%, and reinforcement of verbalization, 100%. The overall agreement on occurrences was 95% and on nonoccurrences, 99%.

A trend analysis, adapted from Alberto and Troutman (1982), was used to identify dependent-variable effects. A trend was defined as three consecutive trials in which a child played with a target object. If the length of time a child did so decreased for two consecutive trials, the behavior was called a declining trend. If the second trial of a declining

trend showed no target-object play, the response was said to have extinguished.

RESULTS

The data, organized by conditions and target responses, appear in Figures 1 and 2. The two target behaviors occurred infrequently during the initial baselines and the first two reinforcement of verbalization conditions. This finding suggests that, before the experiment, the children had not acquired preferences for the target behaviors and had not established say-do relations.

The first time reinforcement was provided for playing at the workbench (CT and RF in Figures 1 and 2), all of the children in the correspondence training group and 5 of those in the reinforcement group played at the workbench, but 1 child in the former group (Ian) showed a declining trend. During the third reinforcement of verbalization phase (maintenance), 5 of the children in the correspondence training group demonstrated trends, but Sal and Al extinguished. One child in the reinforcement condition played at the workbench and 1 was absent for the entire 6 days.

The second time the treatments were provided (CT and RF), all children in both conditions played at the workbench, but 1 child in the reinforcement condition showed a decline (Lem) and another extinguished (Sid). In the fourth reinforcement of verbalization phase (generalized correspondence), 5 of the students in correspondence training played at the free-choice table. Only 2 of the children in the reinforcement treatment did so, and 1 of them (Lem) demonstrated a declining trend.

In summary, both groups performed the target behavior both times the treatments (CT and RF) were provided. Maintenance usually occurred among the correspondence training subjects but was almost absent for those in the reinforcement group. Assessment of generalized correspondence revealed that the behavior of the students exposed to correspondence training generalized to a new response, whereas the behavior of those assigned to the reinforcement treatment did so to a lesser degree.

DISCUSSION

Subject verbalization during training was associated with the maintenance of correspondence and with the generalization of correspondence to an untrained behavior. There were 3 children, however, whose responses deviated from those of their groups. Cal and Lem (reinforcement group) demonstrated generalized correspondence, and Sal (correspondence training) did not. The concept of rule-governed behavior suggests an explanation for the atypical outcomes. During treatment, Cal and Lem may have conceptualized the generalized correspondence rule, and Sal may have acted upon the discriminative correspondence rule. This interpretation, of course, is tentative and requires further research.

The present experiment and the study by Deacon and Konarski (1987) compared the effects of correspondence training with those of reinforcement for saying on some trials and for doing on others. Contrary to our results, Deacon and Konarski found that subject verbalization during training was not necessary to effect verbal-nonverbal correspondence for an untrained behavior. They suggested that rule-governed behavior was responsible for their outcomes.

However, differences in subjects, settings, and procedures between the studies may account for the divergent results. The retarded adults in the Deacon and Konarski (1987) investigation performed in a laboratory setting. Their target behaviors were simple motor actions (e.g., pressing a button), and the treatments involved massed practice (12 20-response trials on each of 4 days). In contrast, our kindergarten children performed in the classroom, their target behaviors were more complex, and they had only one trial on each of 38 days.

Our results were also inconsistent with the conclusion of Baer et al. (1988) that verbalization may be necessary to elicit target responses but that the verbalization may come from either the subject or the experimenter. In the two experiments conducted by Baer and her colleagues, children who received correspondence training (subject verbalization) and who were provided with reinforcement

Figure 1. Percentage of intervals of toy play for each of six children assigned to the correspondence training group during baseline, the reinforcement of verbalization (Rf V), and the reinforcement of correspondence (CT). Missing data points indicate that the child was absent on that day.

Figure 2. Percentage of intervals of toy play for each of 6 children assigned to the reinforcement group during baseline, the reinforcement of verbalization (Rf V), and the reinforcement of playing at the workbench (RF). Missing data points indicate that the child was absent on that day.

for playing what they were told to play (experimenter verbalization) performed the target behaviors, whereas those who were simply rewarded for performing the target behaviors (no verbalization) did not. The inconsistency between our results and those of Baer et al. (1988) may have occurred because Baer et al. investigated the acquisition of target responses, whereas we studied the maintenance and generalization of verbal-nonverbal correspondence.

There were also similarities between the two studies, however. The first time the treatments were presented, almost all of the subjects in both experiments acquired the target responses. In addition, in the Baer et al. (1988) study, the reinforcement of a subject-stated intention for a new behavior followed an experimenter-verbalization treatment and was tantamount to assessing verbal-nonverbal correspondence for an untrained behavior. Consistent with our findings, none of the children demonstrated verbal control of the new behavior.

The similarities and differences between the Baer et al. (1988) study and ours suggest the most significant result of the present study: a proposed elaboration of their conclusion. That is, verbalization from either the subject or the experimenter may be necessary when target behaviors are being elicited, but the generalization of verbal-nonverbal correspondence to untrained responses may require subject verbalization.

Shortcomings of the present study should be considered carefully. Making observations over more extended periods and selecting target behaviors of greater educational relevance may yield very different results. In addition, although the interrater reliability was high, our methodology could be improved by enlisting a naive observer to serve as the primary rater.

Finally, the discrepancies in results between this study and that of Deacon and Konarski (1987) suggest an important line for future research. Deacon and Konarski indicated that rule-governed behavior may have accounted for their results and, therefore, that subject verbalization may not be necessary to accomplish verbal-nonverbal gener-

alized correspondence. We, on the other hand, concluded that subject verbalization may indeed be necessary. Perhaps we are both right. Perhaps subject verbalization is necessary unless rule-governed behavior occurs. The only way to answer this question is to define more clearly rule-governed behavior and to investigate the environmental conditions in which it functions.

REFERENCES

- Alberto, P. A., & Troutman, A. C. (1982). *Applied behavior analysis for teachers*. Columbus, OH: Merrill.
- Baer, R. A., Dettich, R., & Wenzinger, J. M. (1988). On the functional role of the verbalization in correspondence training procedures. *Journal of Applied Behavior Analysis*, *21*, 345-356.
- Baer, R. A., Osnes, P. G., & Stokes, T. F. (1983). Training generalized correspondence between behavior at school and nonverbal behavior at home. *Education and Treatment of Children*, *6*, 379-388.
- Baer, R. A., Williams, J. A., Osnes, P. G., & Stokes, T. F. (1984). Delayed reinforcement as an indiscriminable contingency in verbal/nonverbal correspondence training. *Journal of Applied Behavior Analysis*, *17*, 429-440.
- Baer, R. A., Williams, J. A., Osnes, P. G., & Stokes, T. F. (1985). Generalized verbal control and correspondence training. *Behavior Modification*, *9*, 477-489.
- Deacon, J. R., & Konarski, E. A., Jr. (1987). Correspondence training: An example of rule-governed behavior? *Journal of Applied Behavior Analysis*, *20*, 391-400.
- Guevremont, D. C., Osnes, P. G., & Stokes, T. F. (1986a). Preparation for effective self-regulation: The development of generalized verbal control. *Journal of Applied Behavior Analysis*, *19*, 99-104.
- Guevremont, D. C., Osnes, P. G., & Stokes, T. F. (1986b). Programming maintenance after correspondence training interventions with children. *Journal of Applied Behavior Analysis*, *19*, 215-219.
- Ilg, F. L., Ames, L. B., Haines, J., & Gillespie, C. (1978). *School readiness: Behavior tests used at the Gesell Institute*. New York: Harper and Row.
- Israel, A. C. (1978). Some thoughts on correspondence between saying and doing. *Journal of Applied Behavior Analysis*, *11*, 271-276.
- Israel, A. C., & Brown, M. S. (1977). Correspondence training, prior verbal training, and control of nonverbal behavior via control of verbal behavior. *Journal of Applied Behavior Analysis*, *10*, 333-338.
- Israel, A., & O'Leary, K. D. (1973). Developing correspondence between children's words and deeds. *Child Development*, *44*, 575-581.
- Lovaas, O. I. (1961). Interaction between verbal and nonverbal behavior. *Child Development*, *32*, 329-336.
- Luria, A. R. (1961). *The role of speech in the regulation*

- of normal and abnormal behavior. New York: Pergamon Press.
- Osnes, P. G., Guevremont, D. C., & Stokes, T. F. (1986). If I say I'll talk more, then I will. *Behavior Modification*, **10**, 287-299.
- Rogers-Warren, A., & Baer, D. M. (1976). Correspondence between saying and doing: Teaching children to share and praise. *Journal of Applied Behavior Analysis*, **9**, 335-354.
- Stokes, T. F., Osnes, P. G., & Guevremont, D. C. (1987). Saying and doing: A commentary on a contingency-space analysis. *Journal of Applied Behavior Analysis*, **20**, 161-164.
- Whitman, T. L., Scibak, J. W., Butler, K. M., Richter, R., & Johnson, M. R. (1982). Improving classroom behavior in mentally retarded children through correspondence training. *Journal of Applied Behavior Analysis*, **15**, 545-564.
- Williams, J. A., & Stokes, T. F. (1982). Some parameters of correspondence training and generalized verbal control. *Child and Family Behavior Therapy*, **4**, 11-31.

Received July 15, 1988

Initial editorial decision November 15, 1988

Revisions received February 3, 1989; June 5, 1989; July 20, 1989

Final acceptance July 28, 1989

Action Editor, John M. Parrish