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REPLACING MALADAPTIVE SPEECH WITH VERBAL LABELING RESPONSES: AN ANALYSIS OF GENERALIZED RESPONDING

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We taught three mentally handicapped students to answer questions with verbal labels and evaluated the generalized effects of this training on their maladaptive speech (e.g., echolalia) and correct responding to untrained questions. The students received cues-pause-point training on an initial question set followed by generalization assessments on a different set in another setting. Probes were conducted on novel questions in three other settings to determine the strength and spread of the generalization effect. A multiple baseline across subjects design revealed that maladaptive speech was replaced with correct labels (answers) to questions in the training and all generalization settings. These results replicate and extend previous research that suggested that cues-pause-point procedures may be useful in replacing maladaptive speech patterns by teaching students to use their verbal labeling repertoires.

DESCRIPTORS: question answering, generalization, echolalia, maladaptive speech, probes

Echolalia and perseverative speech can be regarded as inappropriate language strategies (Carr, 1985; Carr, Schreibman, & Lovaas, 1975) that interfere with language training efforts even though they may, in some cases, be functional for the individuals who display them (Durand & Crimmins, 1987; Prizant & Duchan, 1981; Schuler, 1979). Historically, attempts to decrease echolalic responding to questions have focused on either replacing the echolalia with stimulus-specific responses (Carr et al., 1975; Risley & Wolf, 1967) or a generalized verbal response (Schreibman & Carr, 1978) through the use of operant procedures such as imitation training, stimulus fading, differential reinforcement, and verbal prompts.

A recent study suggested a third treatment option that takes advantage of echolalics' verbal labeling skills (McMorrow, Foxx, Faw, & Bittle, 1987). This training approach involved teaching echolalics to label relevant cues (Koegel, Dunlap, Richman, & Dyer, 1981), a response delay requirement (Dyer, Christian, & Luce, 1982), attention training (Foxx, 1977), suppression of off-task behavior (Koegel & Covert, 1972), and provisions for the transfer of stimulus control from an object to the questioner and question (Halle, 1987).

Although McMorrow et al. (1987) reported stimulus-specific and generalized improvements in question answering and reductions in echolalia, their experimental designs did not permit the functional control of generalization to be demonstrated. For example, the generalization results from their Experiment II were quite widespread and presumably clinically important. However, because a multiple baseline across question-response sets and settings was used, only partial experimental control of these generalization effects was demonstrated. In addition, the generalization results were obtained using a format wherein each training trial was followed by one or more generalization trials. Although this format permitted the precise identification of when generalization occurred, it would have been useful to have also had a less reactive measure of generalization such as periodic probes (see Horner & Baer, 1978). Therefore, the goals of the present study were to demonstrate functional control of generalized responding (i.e., generalized reductions in maladaptive speech, primarily echolalia, and improvements in correct responding to untrained stim-

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uli) and to measure the strength and spread of any generalization effects.

METHOD

Subjects

Three students participated. Casey was a 36-year-old male with severe mental retardation (estimated IQ of 27, Vineland Social Maturity Scale) who had been institutionalized for 32 years. Steve was a 13-year-old male with severe mental retardation (IQ 35, Stanford Binet) who had been institutionalized for 4 years. John was a 40-year-old male with profound mental retardation (estimated IQ 20, Vineland Social Maturity Scale) who had been institutionalized for 37 years.

All three performed basic self-help skills with supervision, could identify a variety of common objects when verbally or gesturally prompted to do so, followed simple instructions, and used one- to two-word utterances that were sometimes contextually appropriate. All displayed immediate echolalia when presented with questions. Steve also sometimes displayed perseverative speech when presented with questions by saying "no" repeatedly. Two weeks prior to this study Steve had participated in cues-pause-point training designed to teach students to use the statements of others (i.e., verbal cues) to answer questions (Foxx, McMorrow, Faw, Kyle, & Bittle, 1987). However, he failed to progress in this more complex training program and was removed from the program after 3 weeks.

Settings

Each student's initial baseline and Posttests A through D were administered in a room that contained only a table and chairs. All training trials were conducted in a lounge (4 by 4.9 m) of an occupied office building at the institution. Generalization trials were conducted in an adjacent hallway (2.4 by 17.5 m) and generalization probes in a nearby office (2.4 by 6.9 m), kitchen (1.9 by 3.6 m), and TV room (2.3 by 3.6 m). Each of these settings contained a variety of irrelevant stimuli.

Experimental Design

A multiple baseline design across subjects was used. Each student received training on five question-object/response pairs in the lounge, and generalization to five untrained stimuli was assessed in the hallway. Probes were conducted in the three other settings on a third set of five novel question-object/response pairs as a second measure of generalization. (A list of the 15 question-object/response pairs can be obtained by writing the first author.) Following acquisition, a sequential-withdrawal design (Rusch & Kazdin, 1981) was used across subjects to assess response maintenance.

Target Behaviors and Recording

Stimulus (i.e., question) and response (i.e., object) pairs were developed by creating a question that pertained to each targeted object in the various settings. All questions were between four and eight words long and never contained any part of the correct response (answer). Examples included "What do you use to clean your hands?" or "What do you draw with?" The correct responses were corresponding object labels (e.g., soap, pencil).

The first word or sequence of words that followed the initiation of a question was scored by the trainer and reliability observers in one of five, mutually exclusive, categories: maladaptive (i.e., immediate echolalia or for Steve, perseverative speech defined as saying "no" repeatedly), incorrect, unintelligible, no response (within 5 s of the question), or correct. Correct, incorrect, and maladaptive (echolalic) responses were defined as described in McMorrow et al. (1987).

Four individuals served as reliability observers at various times. Reliability assessments were conducted by an observer standing six feet behind the trainer and student. The observer was instructed to record and score immediately after the student's response and before the trainer's feedback. Reliability was calculated by dividing agreements by agreements plus disagreements and multiplying by 100. Reliability was assessed in all conditions and on at least 40% of the probes for each student. Percentage agreement on all target behaviors averaged 94% for John (range, 67% to 100%), 96%

for Casey (range, 60% to 100%), and 95% for Steve (range, 60% to 100%).

Procedures

Baseline: empty room. The trainer and student sat at a table in an otherwise empty room. The trainer said "I am going to ask you some questions and I want you to answer them the best you can." The trainer asked in a random order each of the five questions from the lounge set and then the five from the hallway set. After each question, the student was given 5 s to respond. Response-specific feedback was provided after each response (i.e., "Good answer" for a correct response, "That's not right" for an incorrect response, and a gentle "No" for maladaptive speech). If the student gave an unintelligible response, the trainer repeated the question once and scored the first response that followed it. A variety of predetermined reinforcers, such as sips of soda, were given for correct responses.

Baseline I. The trainer asked the questions in the lounge and hallway settings in the presence of the objects that represented the correct answers. Before each question, the student was positioned so that he stood within 2 to 3 ft of the object and faced it. After each question, the trainer and student walked to the next object. Feedback and consequences were provided as before.

Response identification training. To ensure that the students would identify the stimuli when the trainer pointed to them during training, they were taught to verbally label the 15 objects in the lounge, hallway, and probe settings (see arrows, Figure 1). This response identification training (see McMorrow et al., 1987) consisted of the trainer pointing to or tapping the object, saying "What's this?," and providing feedback as described above. The trainer modeled the correct label when the student failed to do so and reinforced correctness intermittently. Training continued until a student could correctly label each object during three consecutive trials when the trainer simply pointed to the object. Because the students already could label most of the objects, training usually progressed quickly. Thereafter, this training was always used prior to each trial in conditions in which the objects were present.

Baseline II. Baseline II was conducted after the students had received response identification training and was identical to Baseline I except that the students labeled all of the objects in a set before the presentation of any of the set questions. The baseline conditions were used to isolate the effects on performance of asking questions in the presence of objects prior to and immediately following response identification training because the presence of the objects or this training alone could have enhanced performance.

Cues-pause-point training. The student was escorted to each of the targeted objects in the lounge. The trainer then used the cues-pause-point procedures described in McMorrow et al. (1987) by (a) using the pause prompt (holding his right index finger midway between himself and the student) to keep the student silent during the presentation of instructions and questions; (b) using a point prompt by moving this finger so that it touched the object following a question; (c) using the response identification training prompts if necessary; (d) covering the object with a manilla folder and conducting another trial; and (e) providing feedback and consequences. Thus, each question was presented twice, once with the student viewing the object and immediately thereafter with it covered by a manilla folder. The trainer always presented the five questions in a random order and scored only responses that occurred when the object was covered. Each student's training occurred at approximately the same time each day during sessions that lasted from 10 to 40 min. One to five trials were conducted each session.

Pause only. The trainer did not point to the objects and they were not hidden from the student's view (see McMorrow et al., 1987). Following pretrial labeling, the trainer simply used the pause prompt to maintain the student's silence as he presented the question and then withdrew his hand so that it was closed and in contact with his chest when a response was desired. Feedback and reinforcement were used as before.

Baseline II. This condition was identical to the initial Baseline II condition.

Generalization probes. The students were probed on a novel set of five question-response/

object pairs. Three pairs were assessed in the kitchen setting and one each in the office and TV room.

The probes during the initial baseline conditions were conducted using the procedures in effect for a given condition. Probes were conducted just before each condition change; thereafter, they were conducted using Baseline II procedures. These probes were conducted every fifth trial until the T2 condition (see below), which contained a single probe. Thus, the only difference between the hallway and probe assessments was that the former were conducted after each training trial and the latter intermittently. The trainer conducted all probes.

Programming generalization and assessing transfer of stimulus control. Several phases were used. First, a new trainer (T2) conducted sessions by asking questions in the presence of objects and providing the feedback and consequences (see Figure 1). Second, the original trainer (T1) returned and faded the feedback and consequences. This was done in four trials (see Figure 1, Trials 80 to 83) by progressively reducing the number of responses that were followed by feedback and consequences until they were eliminated. Finally, Posttests A through D were conducted in a novel room with no objects present to determine whether the questions alone had acquired stimulus control over responding (see Figure 1). Posttests were conducted as follows: (A) T1 asked the lounge set of questions followed by the hallway set; (B) a novel person (T3) asked these questions; (C) T1 asked all 10 questions in a random order; and (D) T3 asked all 10 questions in a random order. No feedback or consequences were used during any test.

RESULTS

Figure 1 shows that no student correctly responded to any lounge or hallway questions during the first two conditions (i.e., Empty Room and Baseline I) even though feedback and positive consequences were provided. Maladaptive speech averaged 40% or above (range, 20% to 100%) and became less variable and higher over time. Almost no change in responding occurred after the students were taught to label objects with response identification training (see arrows Baseline II, Figure 1). At the end of Baseline II, all displayed maladaptive speech almost 100% of the time.

The implementation of training in the lounge produced 100% correct responding and 0% maladaptive speech after six training trials for Casey (Trial 16), four for Steve (Trial 20), and five for John (Trial 27). Each student continued to respond correctly at or near 100% throughout training, and maladaptive speech rarely occurred (see Cues-Pause-Point, Figure 1).

Each student's correct responding to the hallway generalization questions eventually reached 100% after tranining was introduced in the lounge. Thereafter, Casey and Steve's correct responding remained high throughout the condition, whereas John's was more variable. All students' maladaptive speech decreased to near zero levels over time. Most important, even when correct responding was below 100%, maladaptive speech was infrequent because the students were incorrectly using object labels that were correct for other stimuli in the set.

The probes on the five novel question-response pairs provided additional support for generalization. Following the introduction of training, each student began correctly responding to the probe questions and showed clear and substantial improvements such that all reached 100% at some point and correct responding remained between 60% and 100% thereafter. Generalization occurred in the first probe conducted after training for Steve (Trial 20) and in the second for Casey (Trial 19) and John (Trial 31). Maladaptive speech was nonexistent after Casey's sixth probe trial (Trial 24), and John displayed none during his last three probes. Steve displayed maladaptive speech on only two of his last five probes. The students' correct performance in both settings and the probes was essentially maintained and maladaptive speech was infrequent as procedural components were withdrawn in the training setting.

In Posttests A through D, only Steve displayed maladaptive speech on the lounge set and only John scored below 60% correct. The hallway set questions represented a more stringent test because this

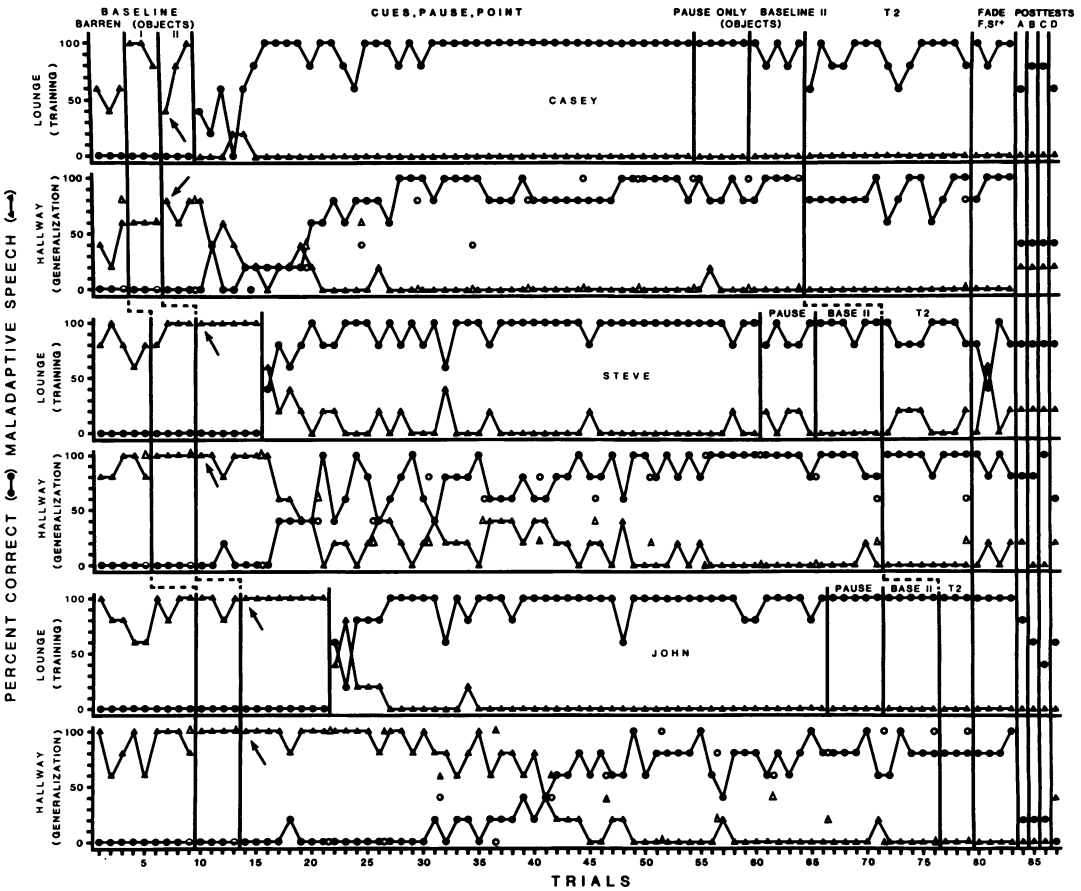

Figure 1. The percentage of maladaptive speech and correct responses to one trained (lounge) and two untrained (hallway and probe) question sets for three students with mental handicaps. The open circles represent correct responses in the probes, and the open triangles represent maladaptive speech. The arrows denote the first trial that followed response identification training. T2 refers to a condition in which a new trainer presented the questions. In the Fade condition, the "F" and "S^{r+}" denote feedback and positive consequences. Posttests A through D represent four different tests.

was the first time the objects were not present (recall that no covered trials were conducted). Although John displayed maladaptive speech in Test D, Steve in Tests A and D, and Casey once in each test, it was much lower than at the end of their baseline assessments. Steve's correct responding dropped below 80% only in Test D, where a novel person presented the questions randomly. Casey correctly responded at 40% in all tests and John at 20% except in Test D.

DISCUSSION

Our goal of demonstrating functional control of generalized responding seemed to have been met because decreases in maladaptive speech and improvements in correct responding in the various generalization settings did not occur until training was introduced for each student in the lounge. These results suggest that a multiple baseline design across subjects with a generalization leg for each subject is useful in demonstrating generalization without sacrificing experimental control of the independent variable. Our other goal of measuring the strength and spread of the generalization effect also seemed to have been met because the probes revealed a generally robust effect. Furthermore, the initial increases and subsequent improvements in correct responding that occurred during the probes and hallway (generalization setting) trials corre-

sponded closely even though the probes were conducted only every fifth trial. Elements from training that may have enhanced these generalization effects included (a) having the trainer conduct the assessments, (b) having the students label objects prior to each assessment, (c) positioning the students so that they faced the correct object, and (d) using the same feedback and consequences (e.g., see Stokes & Baer, 1977).

The most important finding was that maladaptive speech decreased substantially across all subjects and generalization settings. The correct performance data are of less interest because they merely represent the students' use of their recently trained labeling skills. Thus, correct responding is important only to the extent that it, together with the incorrect use of object labels to questions, represents a nonecholalic strategy that replaces an echolalic one. Indeed, the incorrect use of object labels is of more interest because it typically replaced maladaptive speech whenever correct responding was less than 100%. Hence, the students appeared to learn an alternative response strategy when information was requested of them that was not in their repertoire (e.g., see Schreibman & Carr, 1978).

The posttest results revealed that there was more transfer of stimulus control from the objects and questions to the questions alone in the training set than in the generalization set. This appeared to be the result of procedural differences between the sets because, during training, the students answered the questions twice (i.e., during uncovered and covered trials) but only once (an uncovered trial) in the generalization setting. Clearly, the covered trial represented a prompt fading procedure (Striefel & Owens, 1980) that could have facilitated the transfer of stimulus control. Thus, it was not surprising that less transfer occurred in the generalization set because the posttests were the first time the hallway questions were presented without the objects being present. Another facilitating factor could have been the students' double exposure to questions each trial during training (uncovered and covered). Because our primary aim was to assess the development and emergence of students' nonecholalic strategy (i.e., the replacement of maladaptive speech with incorrect and correct object labels), we did not attempt to program the transfer of stimulus control in the generalization setting.

In conclusion, the results replicate and extend previous research that indicated that cues-pause-point procedures can affect maladaptive language strategies such as echolalia (McMorrow & Foxx, 1986; McMorrow et al., 1987; McMorrow, Foxx, Faw, & Bittle, 1986) and delusional speech (Foxx, McMorrow, Davis, & Bittle, 1988). These procedures could possibly be used to augment language training programs that attempt to teach functional speech to individuals who display maladaptive language strategies.

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