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THE EFFECTS OF ECHOLALIA ON ACQUISITION AND GENERALIZATION OF RECEPTIVE LABELING IN AUTISTIC CHILDREN

MARJORIE H. CHARLOP

CLAREMONT GRADUATE SCHOOL

This investigation, consisting of two experiments, was designed to assess the effects of autistic immediate echolalia on acquisition and generalization of receptive labeling tasks. Experiment 1 addressed whether autistic children could use their echolalia to facilitate acquisition. The results indicated that incorporating echolalia (echo of the requested object's label) into the task before manual response (handing the requested object to the experimenter) facilitated receptive labeling. Experiment 2 was designed to determine the effects of incorporating echolalia into task response on acquisition and subsequent generalization. These results indicated that echolalia facilitated generalization for echolalic autistic children but not for functionally mute autistic children. The results of the experiments are discussed in terms of stimulus control. Additionally, it is proposed that perhaps in certain cases, echolalia should not be eliminated, but used to advantage in receptive responding.

DESCRIPTORS: autism, echolalia, receptive labeling, generalization

One of the most striking characteristics of autistic children is their failure to use speech to communicate (Carr, Schreibman, & Lovaas, 1975; Kanner, 1943; Ornitz & Ritvo, 1976; Rimland, 1964; Rutter, 1978; Schreibman & Carr, 1978; J. K. Wing, 1966; L. Wing, 1978). Quite often, their speech is echolalic. Words are used, but not in a meaningful way. There are two major types of echolalia, delayed and immediate. *Delayed* echolalia is the inappropriate utterance of a statement that the child has heard sometime in the past (Carr et al., 1975; Schreibman & Carr, 1978). *Immediate* echolalia is commonly called "parrot speech," as it consists of repeating or "echoing" all or part of what was just said. For example, if an echolalic autistic child was asked "What's your name?" the child would respond by saying "What's your name?" Immediate echolalia is frequently problematic in that it interferes with effective communication and learning (Carr et al., 1975; Schreibman & Carr, 1978). The child who echoes instructions to a task, in lieu of performing the task, would probably fail to learn.

Echoing is seen in normal children as well. For example, when first learning to speak, a young child will often imitate or "echo" his or her parents saying "doggie" before pointing to the dog. This echoic behavior (the term applied to normal children's echoes) (Skinner, 1957) appears to be a step in the development of appropriate language (Fay, 1967; Haworth & Menolascino, 1968; Nakanishi & Kenjiro, 1973; Van Riper, 1963) and tends to dissipate by the age of 30 mo (Nakanishi & Kenjiro, 1973; Van Riper, 1963). It is seen as an attempt to understand new words and as a useful mechanism for

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learning language (Church, 1961; Fay, 1967; Fay & Butler, 1968, 1971; Fay & Schuler, 1980).

A series of studies, supporting the notion that echoic behavior in normal youngsters facilitates language development, demonstrated that echoic behavior increased when novel verbal stimuli (i.e., new vocabulary words) were presented. Those children who echoed generally did better on vocabulary tests than those who did not (Fay, 1967; Fay & Butler, 1968, 1971). These researchers proposed that the "echo-reaction is a potentially active approach to verbal comprehension . . . " (Fay & Butler, 1971, p. 651).

No studies, however, have addressed whether autistic children could use their echolalia as an active approach to learning (for the remainder of this article, the term echolalia will refer to immediate echolalia only). In fact, most language training studies have focused on the elimination of echolalic responding. This is understandable in that there appears to be an inverse relationship between echolalia and appropriate speech—as echolalia decreases, appropriate speech increases (Carr et al., 1975; Schreibman & Carr, 1978). This inverse relationship, however, is task specific and usually does not affect the occurrence of echolalia in other situations (Fay & Schuler, 1980; Palyo, Cooke, Schuler, & Apolloni, 1979). Generally then, echolalia is seldom replaced with appropriate speech, and thus it remains a major problem in the treatment of autism.

There are several distinctions that can be made between echolalia in autistic children and echoic behavior in normal children. Echolalia has been viewed as pathological repetitions when words are *not* used in an appropriate way. It is a major characteristic of many autistic children and persists long after the typical age of cessation in normal children (i.e., Kanner, 1943; Rimland, 1964; Rutter, 1978). Echolalia differs in quality and quantity from normal children's echoic behavior, and has generally been seen as an obstacle to normal language development (deHirsch, 1967; Fay, 1969; Lovaas, Koegel, Simmons, & Long, 1973; Phillips & Dryer, 1977; Ricks & Wing, 1975; Simon, 1975).

There is, however, an important similarity between echolalia and normal children's echoic behavior. Echolalia, like echoic behavior, also increases with the presentation of novel verbal stimuli (Carr et al., 1975; Schreibman & Carr, 1978; Tucker, O'Dell, & Suib, 1978). In these studies, the children echoed novel verbal stimuli (phrases they had never heard before) but responded appropriately to discriminative stimuli (those for which they had appropriate responses).

Research has also indicated that in addition to novel verbal stimuli, other stimulus conditions have been associated with an increase in echolalia. Resnick (Note 1) has demonstrated that echolalia increases in novel teaching settings. Echolalia in retarded children increased when a novel task was presented by an unfamiliar person. Resnick concluded that environmental change affected the rate of echolalia, with novel environments promoting the greatest amount of echolalia. Charlop (Note 2) studied the relationship between echolalia in autistic children and novel settings. Six autistic children were presented with a receptive labeling task in each of six settings varying in novelty. Each setting consisted of a combination of novel or familiar room therapist, and task stimuli. The results indicated that the children echoed the least in the most familiar setting (familiar therapist, familiar stimuli, familiar room). The most echolalia occurred in the setting in which novel task stimuli were presented by a novel person. Thus, research has suggested an association between novel stimulus conditions and an increase in echolalia.

These findings on setting novelty and echolalia are interesting in light of the problem of generalization. Researchers continually report that behaviors taught in one setting (e.g., clinic) may not transfer or generalize to novel settings (e.g., neighbor's house) (e.g., Baer, Wolf, & Risley, 1968; Birnbrauer, 1968; Kazdin & Bootzin, 1972; Lovaas et al., 1973; Rincover & Koe-

gel, 1975; Stokes & Baer, 1977; Wahler, 1969; Walker & Buckley, 1972). Since echolalia, unlike newly acquired behaviors, tends to increase in novel settings (Resnick, Note 1; Charlop, Note 2), it may be possible to facilitate generalization of an appropriate behavior by associating it with an echolalic response. Additionally, if autistic children could use their echolalia in the same manner as normal children (i.e., as an active approach to learning), perhaps echolalia could facilitate acquisition of language tasks as well.

This investigation consists of two studies designed to determine the effects of incorporating echolalia into task response on acquisition (Experiment 1) and generalization (Experiment 2) of receptive labeling in autistic children.

EXPERIMENT 1

This study was designed to determine if autistic children could use their echolalia to facilitate acquisition of receptive labeling tasks.

METHOD

Children

Five echolalic autistic children participated in this study. Child 1 was 11.7 yr old, Child 2 was 7 yr old, Child 3 was 10.8 yr old, Child 4 was 18.8 yr and Child 5 was 5 yr (mean = 10.7 yr). The mental ages, as derived from the Merrill-Palmer Scale, of Child 1, Child 2, and Child 5 were 2.10 yr, 3.7 yr, and 2.8 yr, respectively. Child 4's MA, as derived from the Leiter International Performance Scale, was 4.3. The mean MA was 3.2 yr. Child 3 was untestable. All the children were diagnosed as autistic by two independent agencies using the National Society for Autistic Children criteria for autism (Ritvo & Freeman, 1978). All the children were echolalic and described as such by their teachers, therapists, parents, and a child psychologist. During a 20-min therapy session, the child would typically echo 90% of all commands (e.g., "Give me dog," "Touch your nose.") The children displayed self-stimulatory behaviors such as repetitive arm and hand movements, rocking, and facial grimacing. Their teachers and therapists reported that they had difficulty in learning two-object discrimination tasks.

Design and Setting

A single-subject reversal design replicated across subjects with a multiple-baseline control was used. During baseline, each child was tested to determine if he or she could learn the receptive labeling task with a trial and error procedure. Since the children did not reach criterion of 90% correct response within 20 consecutive trials, they were presented with the experimental conditions (described below). The order of presentation of these conditions was counterbalanced to control for order effects. Each child was presented with trial and error (baseline), an echo relevant word condition, reversal to baseline (trial and error), and an echo irrelevant word condition. Child 4 and Child 5 were presented with another condition, the two S^D condition, as an added control. The number of trials during baseline and the order of presentation of the

Table 1

The number of trials during baseline and the order of presentation of the experimental conditions for each child.

Child	*# of Trials in Baseline*	*Order of Presentation of Experimental Conditions*
1	50	Baseline, Echo Relevant Word, Baseline, Echo Irrelevant Word
2	80	Baseline, Echo Irrelevant Word, Echo Relevant Word, Baseline
3	110	Baseline, Echo Relevant Word, Echo Irrelevant Word, Baseline
4*	80	Baseline, Two S^D, Echo Relevant Word, Baseline, Echo Irrelevant Word
5*	90	Baseline, Echo Relevant Word, Two S^D, Echo Irrelevant Word, Baseline

*Added two S^D condition.

conditions for each child can be seen in Table 1.

Each session was conducted in a small therapy room (2.9 × 2.9 m) or in an area partitioned off from the classroom. The experimenter and child sat facing each other, separated by a small table. Sessions consisted of one 20-min work period and were conducted three times a week.

Procedure

The children were presented with a receptive labeling task consisting of two objects in each of the conditions described below. The objects presented to each child are listed in Table 2. The children would differentiate the objects by giving the requested object to the experimenter. This type of task was chosen to limit verbalizations only to the echoes and to allow for the inclusion of functionally mute children in later parts of the investigation. Trials were presented when the child was sitting quietly across from the experimenter and not engaged in any off-task behavior. On each trial, the child was required to hand the experimenter one of the two objects set before him or her. A correct answer was reinforced with verbal praise and a food reinforcer. The praise was delivered on a continuous schedule of reinforcement with the food delivered on a VR:3 schedule. Incorrect responses (handing the experimenter an object not requested or failure to respond within 5 sec) resulted in a verbal "no" and immediate removal of both objects. For each trial, the position of the stimuli was determined by a Gellermann (1933) alternation order to prevent the child from learning the discrimination on the basis of position. In addition, trials were generally nonconsecutive with neither object requested for more than three trials in a row.

Trial and Error

A trial and error method was used during baseline conditions. During trial and error, the objects were first placed in front of the child. When the child was sitting attentively, ready for a command, the experimenter then held out her hand and said the label of one of the objects.

Table 2

Objects used for all conditions and words echoed during the echo irrelevant work condition for each child.

	Child 1	*Child 2*	*Child 3*	*Child 4*	*Child 5*
Objects	quarter, dime	horse, boat	circle, square	counter, tape	building, spool
Irrel. Words	slogan, fixture	nail, ring	gingham, yak	locket, knob	legal, dome

The experimenter waited 5 sec for the child to place the object in her hand. The appropriate consequences were supplied and the next trials were presented.

The number of trials during baseline differed to determine whether the child would learn the receptive labeling task over time (see Table 1). During return to baseline conditions (reversals), trial and error continued for 50 trials or until the child reached the criterion of 90% correct responding within 20 consecutive trials. The reversal condition was used to determine if it was necessary to maintain the echoing for continued correct response.

Echo Relevant Word Condition

In this condition, the experimenter said the label (name) of one of the objects but did not present the two objects used in the receptive labeling task until after the child was finished echoing the experimenter's verbalizations (the object's label). The experimenter then placed the two objects before the child, held out her hand and asked for the object by repeating the object's label. For example, a trial consisted of the experimenter saying, "boat," the child echoing "boat," the experimenter placing the two objects (boat and horse) before the child and asking for "boat," with the child handing the experimenter an object. The experimenter then provided consequences for the response and recorded it as correct or incorrect. As expected, the children echoed on all of the trials. This condition continued for 50 trials or until the child reached a criterion of 90% correct responding within 20 consecutive trials.

Echo Irrelevant Word Condition

This condition used the same procedure as the echo relevant word condition except that an irrelevant word, not associated with the training stimuli, was initially presented instead of the object's label. For example, a typical trial consisted of the experimenter saying "yak," the child echoing "yak," the experimenter placing the two objects before the child (circle and square), extending her hand and asking for "square." This condition was used to determine if any mediating verbal response was enough to facilitate acquisition of the discrimination. Table 2 lists the objects used for each child and the irrelevant words the child echoed. The irrelevant words were randomly presented so that a specific word was not associated with a specific object. Additionally, the irrelevant words were chosen because they were unfamiliar to the child and would not cause confusion due to previously learned associations. This condition continued for 50 trials or until the child reached criterion of 90% correct response within 20 consecutive trials.

Two S^D Condition

In order to ascertain that responding during the echo relevant word condition was influenced primarily by the child's echo as opposed to the experimenter's two presentations of the object's label (one before the placing of the objects and one after), this additional condition was presented to Child 4 and Child 5. In this condition, the experimenter said the object's label twice, once while placing the objects down before the child and again while holding out her hand in request of the object. The experimenter presented the two S^D's (object's labels) one right after the other so that there was no time for the child to echo in between. For example, a typical trial consisted of the experimenter saying, "spool, (while placing the objects down before the child) spool" (while extending her hand), and the child handing the experimenter one of the objects. This condition continued for 50 trials or until the child reached criterion of 90% correct response within 20 consecutive trials.

Reliability

Interobserver reliability checks were taken by undergraduate and graduate students for 70% of all trials in each condition. It was calculated by dividing the number of agreements for correct and incorrect responses by the total number of agreements plus disagreements. Reliability was 98%.

Results and Discussion

The performance of Child 1, Child 2, and Child 3 can be seen in Figure 1. Figure 2 shows the performance of Child 4 and Child 5 on the tasks. Plotted along the abscissa of the graphs are blocks of 10 trials, for each of the conditions, in the order that they were presented. Plotted on the ordinate is the percentage of correct responses.

All the children failed to reach criterion by trial and error during baseline and responded at approximately chance level. During the echo irrelevant word condition, reversal to trial and error, and during the two S^D condition for Child 4 and Child 5 (See Figure 2), criterion of 90% correct response within 20 consecutive trials was not reached and correct responding remained at low levels as in baseline. However, during the echo relevant word condition, each child reached criterion within the allotted 50 trials. Of interest is the sharp initial increase in correct response during the echo relevant word condition for all children.

Thus, Experiment 1 demonstrated that relevant echolalia, when incorporated into task response, facilitated performance. During the echo relevant word condition, when the child echoed the object's label before manual response, task performance reached criterion. During all other conditions, correct response was quite low. The low percentage of correct response for all children during the echo irrelevant word condition suggests that any mediating verbal response did not facilitate performance because

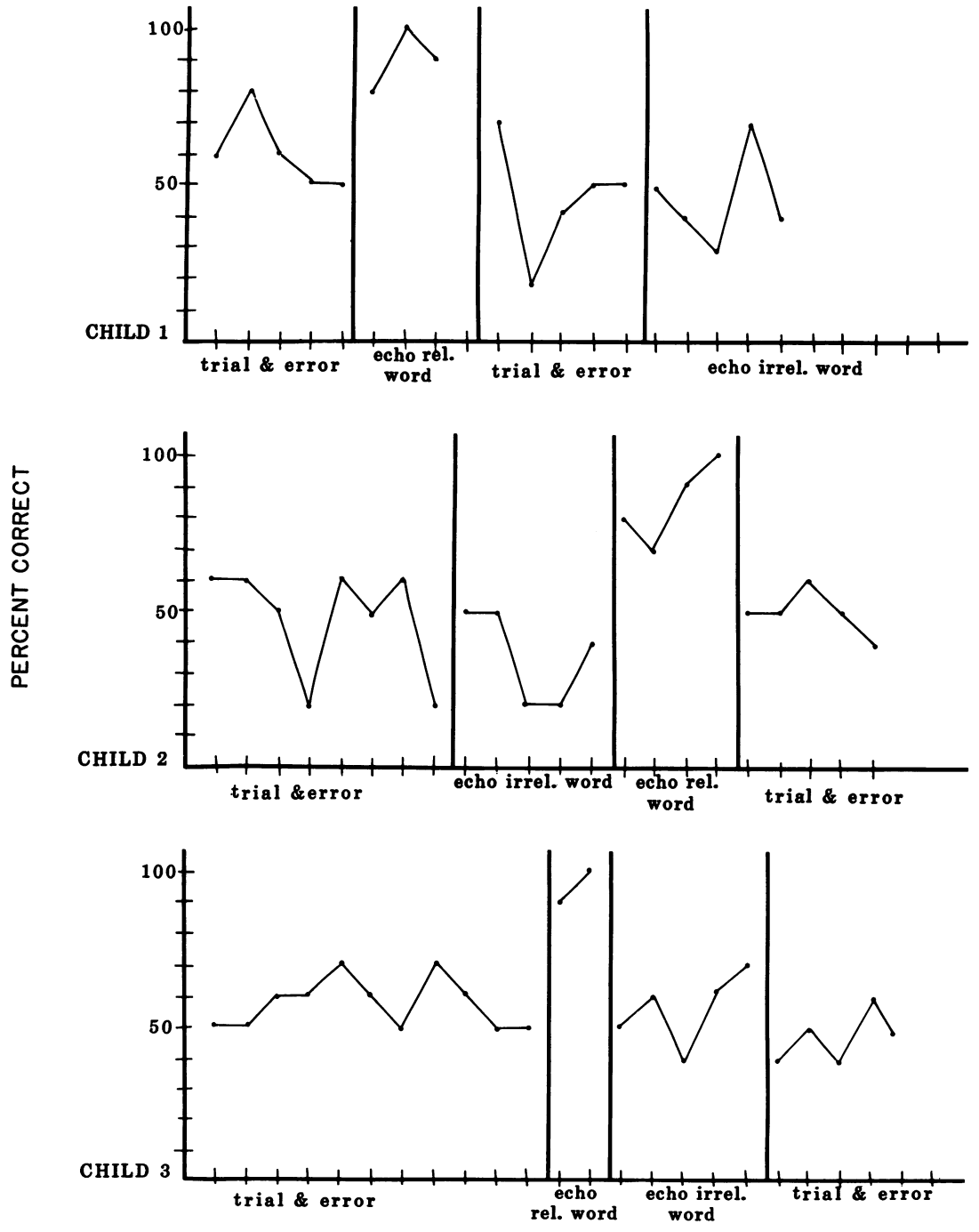

Fig. 1. Percent correct for Child 1, Child 2, and Child 3 during baseline, echo relevant word condition, echo irrelevant word condition, and trial and error reversal.

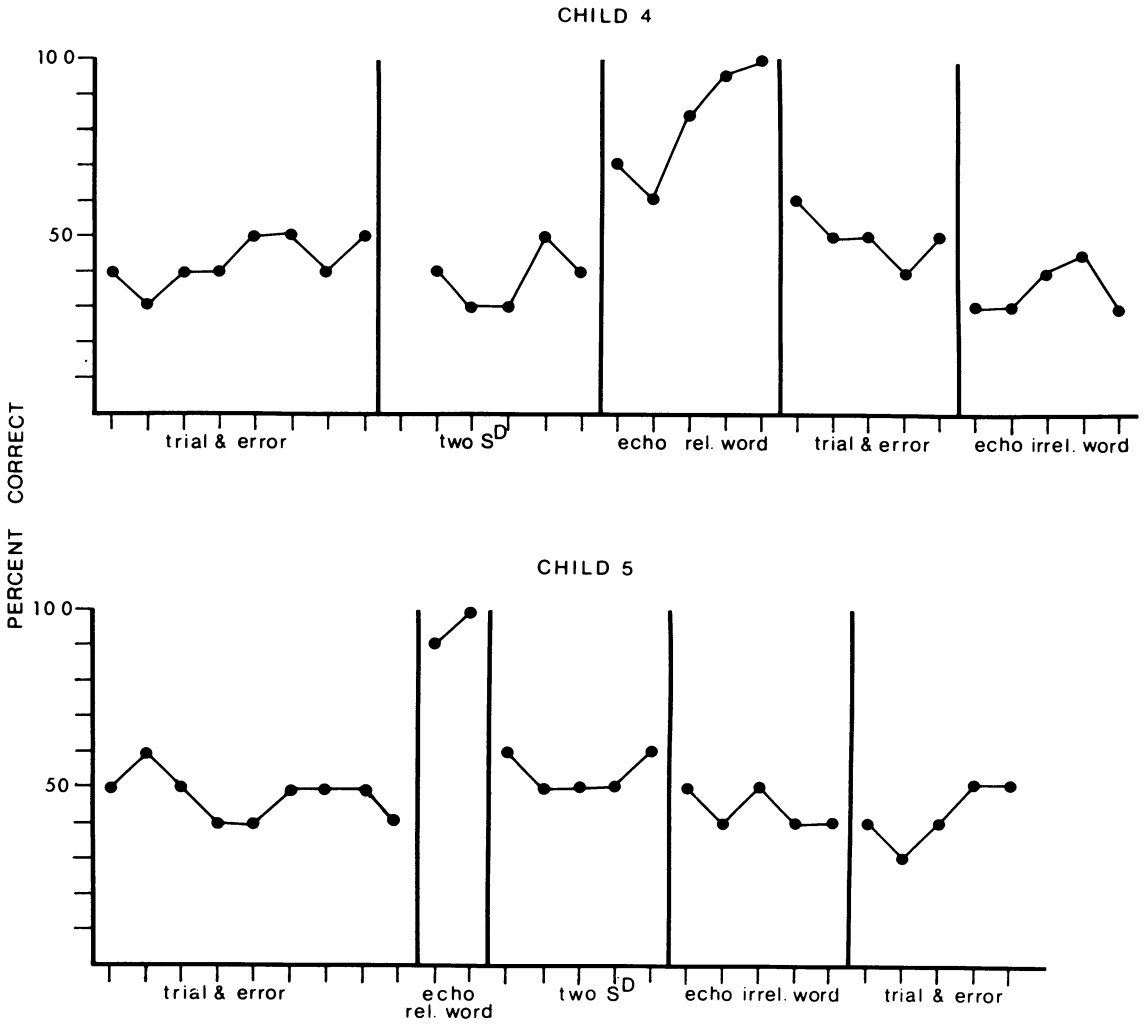

Fig. 2. Percent correct for Child 4 and Child 5 during baseline, echo relevant word condition, echo irrelevant condition, trial and error reversal, and two S^D condition.

performance during this condition for all children was quite similar to baseline. The poor performance during reversal suggests that the relevant echolalia incorporated into the task was necessary to maintain continued correct responding. Finally, the low level of correct responding by Child 4 and Child 5 during the two S^D condition suggests that superior performance during the echo relevant word condition may be primarily due to the echolalia and not the experimenter's presentations of the object's label. The results of Experiment 1 then suggest that autistic children may use their echolalia to facilitate correct response.

EXPERIMENT 2

Past research suggests that echolalia increases in novel situations (Carr et al., 1975; Resnick, Note 1; Charlop, Note 2). Experiment 1 and research with normal children suggest that echoic response facilitates performance on new

tasks (Fay & Butler, 1971). Since echolalia appears to be a behavior that increases in novel settings, whereas newly acquired behaviors do not (the problem of generalization), perhaps an appropriate response can be associated with echolalia to promote generalization as well as to facilitate acquisition. This study was designed to determine the effects on generalization of echolalia when it has been incorporated into task response.

METHOD

Children

Six autistic children participated in this study. All the children were diagnosed as autistic by two independent agencies according to the National Society for Autistic Children criteria (Ritvo & Freeman, 1978). Three of the children were echolalic and described as such by their teachers, therapists, and a child psychologist. They typically echoed 90% of all commands given in a 20-min work session. The echolalic children's ages were 5.4 yr, 10.5 yr, and 14 yr, (mean = 9.6 yr) with mental ages of 2.5 yr (from the Merrill-Palmer Scale), 4.0 yr, 2.5 yr (from the Leiter International Performance Scale), respectively (mean = 3.0 yr). The other three children were functionally mute and described as such by their teachers, therapists, and a child psychologist. These children had some limited speech and could imitate sounds, although those were frequently inaccurate imitations. These children seldom spoke spontaneously. The functionally mute children's ages were 3.0 yr, 6.5 yr, and 14.7 yr (mean = 8.3 yr) with corresponding MA's of 2.5 yr (from the Merrill-Palmer Scale), 1.8 yr (from the Leiter International Performance Scale), and untestable (mean = 2.2 yr). The functionally mute children were included in this study to determine if they could learn an imitative response, similar to the spontaneous relevant echoes of the echolalic children. This imitative response could possibly function in a similar manner and facilitate task acquisition and generalization. All six children engaged in typical autistic behaviors such as social isolation, self-stimulatory behaviors, noncompliance, inappropriate affect, and tantrums.

Task Stimuli

Each child was presented with two receptive labeling tasks, each using two objects. These objects were unusual items, belonging to the experimenter, which the children had presumably never labeled before. These objects were chosen because they were novel to the children and not associated with any past reinforcement (see Table 3).

Design and Setting

A single-subject design replicated across subjects was used to compare the differential effectiveness of two training conditions (echo condition versus no echo condition) on the acquisition, generalization, and maintenance of receptive labels. After a pretest to determine that the child could not receptively label the two pairs of objects, each child was presented with the two training conditions in a counterbalanced order. Following each training condition, generalization and maintenance was assessed.

All training conditions took place in a small therapy room (2.9 × 2.9 m) or an area partitioned from the classroom. Generalization and maintenance trials were presented in rooms in the children's school or college classrooms in which the children had never been. Sessions con-

Table 3

Objects used in receptive labeling tasks during each condition for each child.

Child	*Echo Condition*	*No Echo Condition*
1	badge, vial	blush (compact), (fingernail) polish
2	vial, polish	(guitar) pick, blush
3	badge, polish	blush, vial
4	blush, (eye) liner	badge, polish
5	blush, badge	vial, polish
6	pick, vial	badge, liner

sisted of 20- to 30-min work periods 3 days a week.

Procedure

Pretests. Each child was pretested with two pairs of objects. One pair was later used for the echo condition and the other for the no echo condition. The pretests consisted of 10 trials for each pair with no consequences provided for task performance. The two items were placed before the child. When the child was displaying good eye contact and no off-task behaviors, the experimenter extended her hand, said the label of one of the objects, waited for the child to place an object in her hand, and then recorded the response as correct or incorrect. The stimuli were then removed and a new trial was presented. The positions in which each object was placed and which object was requested were determined by a Gellermann (1933) alternation order. The children were reinforced for appropriate nontarget behavior such as "good sitting" on a VR:3 schedule in order to maintain their responding. After 10 trials (five of each object) were completed, the second pair of objects was pretested. If the child did not reach criterion of 60% correct responding, then it was assumed that the child did not know the labels of the objects. After these pretests were completed by the therapist in a familiar setting (the therapy room or partitioned work area in the classroom), a generalization pretest was presented in the same manner by two unfamiliar persons (one person for each pair of objects) in two unfamiliar settings. This was done to assess later if the behaviors had generalized to the novel setting. After the pretests, the child was presented with either the echo or no echo condition.

Echo Condition

The procedure used in the echo condition was very similar to the one in Experiment 1. Thus, as in Experiment 1, the experimenter said the label of one of the objects and placed the pair of objects before the child. After the child echoed the object's label, the experimenter extended her hand and said the label of the object, and waited for the child to hand her the object. Consequences for the response were provided (as previously described) and the response was recorded as correct or incorrect. The objects were then removed and a new trial presented. The child was reinforced for correct responding with verbal praise on a CRF schedule of reinforcement and a food reinforcer delivered on a VR:3 schedule. A verbal "no" was delivered contingent on incorrect responses. The functionally mute children did not immediately repeat the experimenter's verbalizations, as the echolalic children did. Thus, the experimenter waited approximately 5 sec before placing the objects, as a prompt for the child to imitate her. After approximately 10 trials, the functionally mute children learned the requirements of the task and imitated the experimenter immediately after her verbalizations. During later training trials, however, the functionally mute children occasionally failed to imitate the experimenter. When this occurred, the experimenter repeated the label. If the child still did not echo, the trial was recorded as incorrect and the therapist presented the next trial. When the child reached criterion of 90% correct response within 20 consecutive trials, the child was tested for generalization and maintenance of correct responding.

To assess generalization and maintenance across trials, the child was taken into the unfamiliar room by the unfamiliar person. There the child was presented with 50 trials (25 of each object) with no consequences provided for target behaviors in the manner similar to the pretest. Correct and incorrect responses as well as trials in which the children echoed or imitated the experimenter were recorded.

No Echo Condition

During this condition, the child was taught to label receptively a pair of objects by trial and error and other traditional procedures (i.e., prompting) that are typically used. This consisted of reinforcing correct responses with food

and praise. Incorrect responses were followed by a verbal "no." When necessary, the experimenter would prompt the correct answer by pointing to the requested object (which occasioned correct responding). The experimenter would subsequently withdraw this pointing prompt by gradually moving her finger further and further away from the object on each trial until the child responded correctly without the prompt. When the child reached criterion of 90% correct response within 20 consecutive trials, the child was tested for generalization and maintenance in the same manner described above.

Reliability

Interobserver reliability was calculated in the same manner as described in Experiment 1. Reliability checks were taken for 70% of all trials. Reliability was 98%.

Results and Discussion

All the children learned the labeling tasks in fewer trials during the echo condition (mean = 41.7 trials) than during the no echo condition (mean = 68.3). As predicted by Experiment 1, echolalia facilitated acquisition. This effect was slight for the functionally mute children, but quite dramatic for the echolalic children (see Table 4). The echolalic children reached criterion during training in 36.6 fewer trials in the echo condition than in the no echo condition while the mute children reached criterion in 16.6 fewer trials in the echo condition than in the no echo condition.

Figure 3 shows the performance of the functionally mute children (Child 1, Child 2, and Child 3). Plotted along the abscissa of the graphs are blocks of 10 trials. Plotted on the ordinate is percent correct response. The functionally mute children generally learned the labeling tasks in fewer trials during the echo condition (mean = 46.7 trials) than during the no echo condition (mean = 63.3 trials). However, they showed poor generalization regardless of condition, averaging 50% correct responding for the echo condition and 59% for the no echo condition. Although the functionally mute children "echoed" during training in the echo condition, they did not do so during generalization trials in this condition.

Table 4

Mean number of trials during training in each condition for the mute and echolalic children.

	Echo Condition	*No Echo Condition*
Mute	46.7	63.3
Echolalic	36.7	73.3
Total	41.7	68.3

The echolalic children's data are plotted in Figure 4. The echolalic children learned the tasks in fewer trials during the echo condition (mean = 36.7 trials) than during the no echo condition (mean = 73.3 trials). There was a striking difference in generalization between the echo and no echo conditions (see Figure 4). When the echolalic children acquired the response in the echo condition, generalization occurred for all the children, with a maintenance of correct responding at 100%. However, when the no echo condition was used, the children showed poorer generalization with a mean correct response of only 63%. Additionally, echolalia occurred on 100% of the generalization trials in the echo condition for all three children, but during only 48% of the generalization trials in the no echo condition for Child 4 and Child 5. Child 6's data are of special interest. He regained 100% correct responding during the last 40 generalization trials in the no echo condition. It is noteworthy that Child 6 had acquired the tasks in both conditions in fewer trials than the other echolalic children. In addition, as part of the counterbalancing, Child 6 was presented with the echo condition before the no echo condition. During the generalization trials in the no echo condition, this child spontaneously echoed in the same manner that he did during the echo condition. Thus, of all the children, he would be the most likely to generalize. However, for all the echolalic children, including Child 6, the echo condition was superior in facilitating generalization.

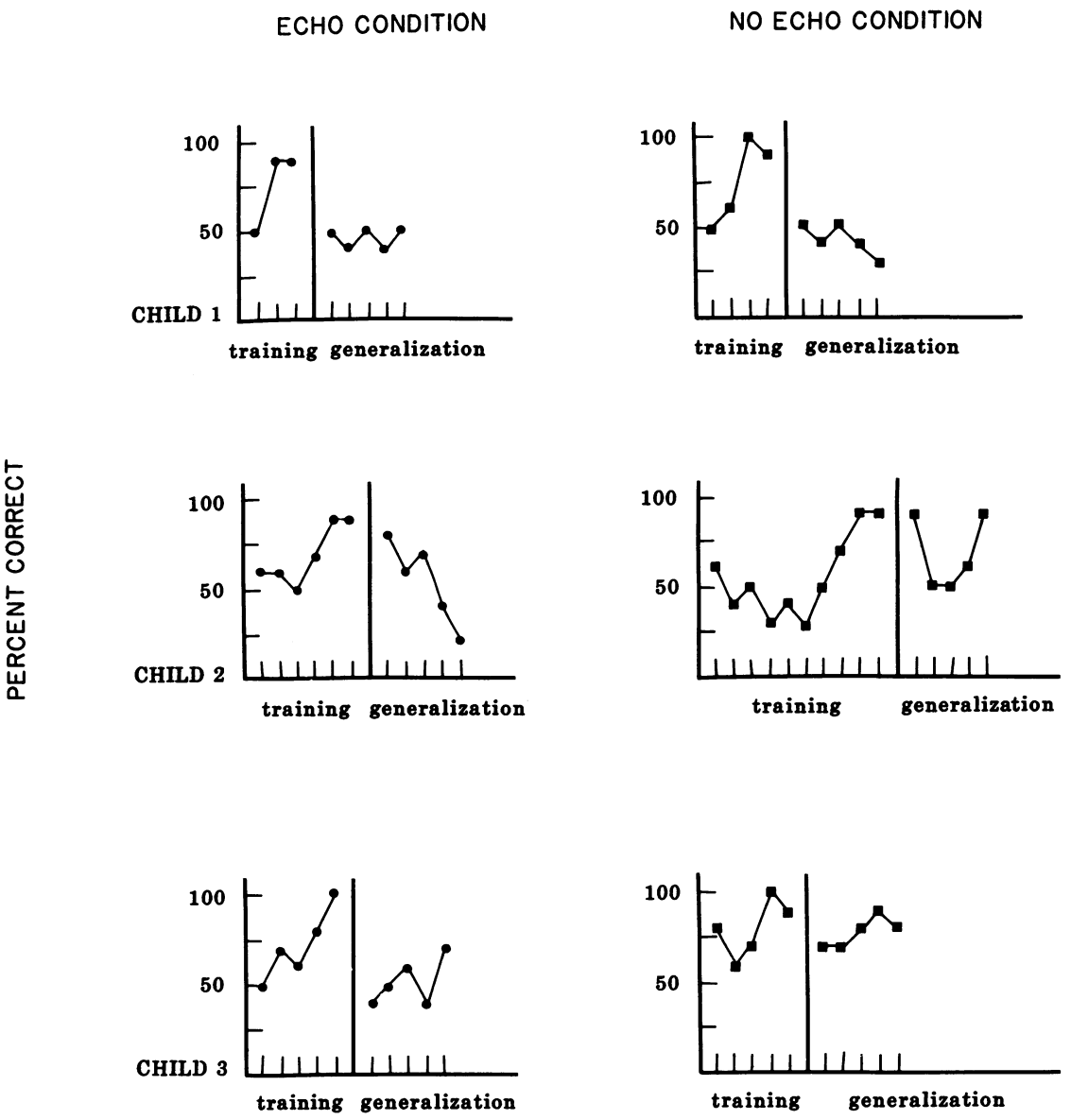

Fig. 3. Percent correct for each mute child during training and generalization for the echo and no echo conditions.

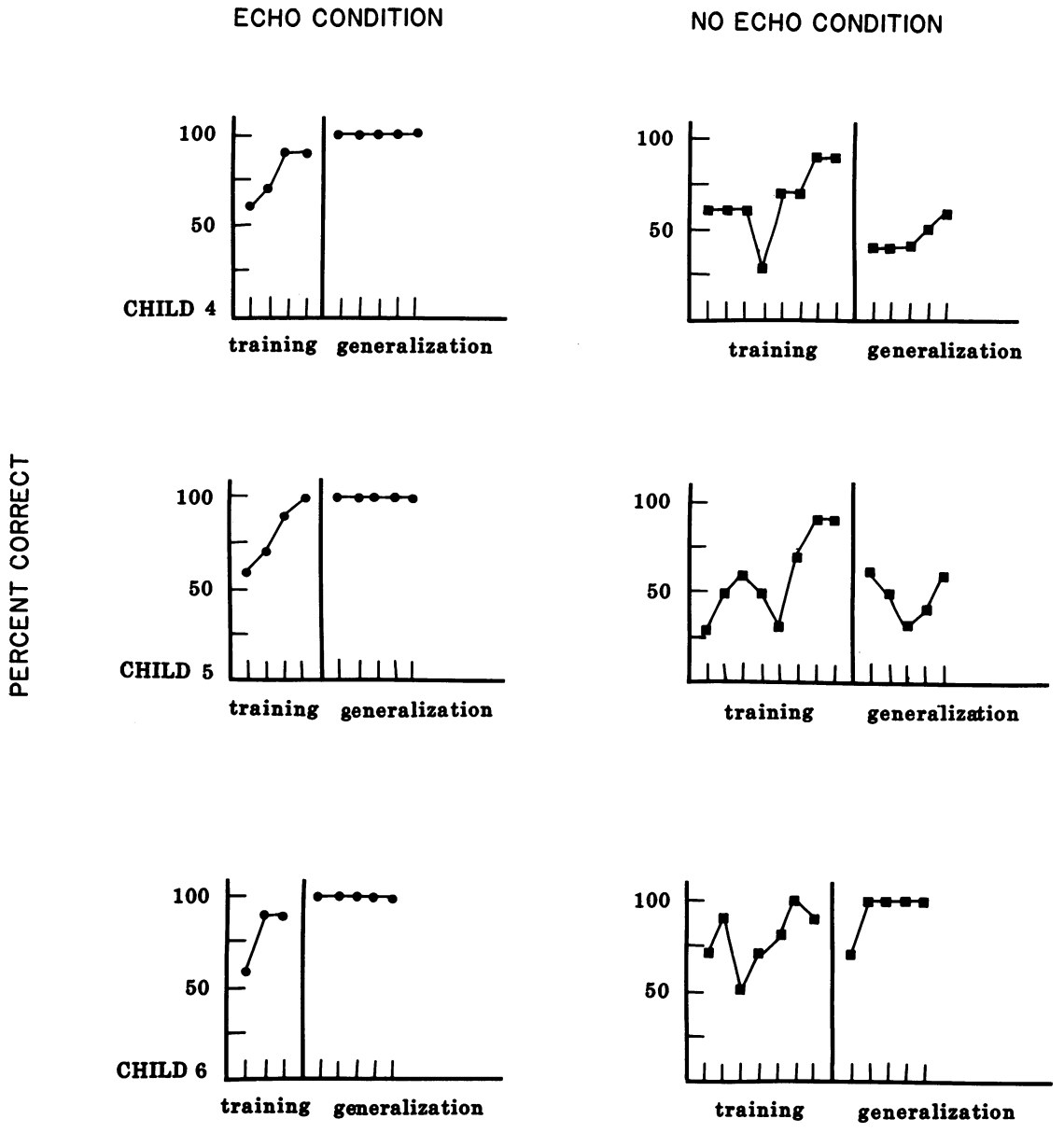

Fig. 4. Percent correct for each echolalic child during training and generalization for the echo and no echo conditions.

These results demonstrated that when echolalia was incorporated into task response, acquisition was slightly faster as compared to trial and error for the functionally mute children and much faster for the echolalic autistic children. The echolalia appeared to facilitate generaliza-

tion and maintenance across trials for the echolalic children but not for the functionally mute children.

GENERAL DISCUSSION

Past research with normal children has suggested that echoic behavior may facilitate performance on receptive labeling tasks (cf. Fay & Butler, 1968, 1971). Experiment 1 demonstrated that, like normal children, autistic children could use their echolalia to facilitate task performance. Thus, Experiment 1 presents a potential new teaching procedure, the incorporation of echolalia into task response, as a successful method of improving performance on receptive labeling tasks.

Experiment 2 was based on the literature suggesting that echolalia may be a behavior, unlike newly acquired behaviors, that increases in novel settings (cf. Carr et al., 1975; Resnick, Note 1; Charlop, Note 2). Experiment 2 explored the feasibility that appropriate behaviors (i.e., receptive labeling) associated with echolalia may also increase in novel settings. Thus, generalization of these new behaviors would be promoted. In summary, the incorporation of echolalia into task response may have a facilitative effect on generalization (Experiment 2) as well as acquisition (Experiments 1 and 2) for echolalic autistic children. A suggested explanation of these findings relates to stimulus control.

Recall that during conditions in which echolalia was incorporated into the task response, the children echoed the object's label before manual response. In other conditions, this was not so. But, typical of echolalic children, echolalia did occur during the other conditions. The important distinction between this extraneous echolalia and the echolalia incorporated into task response may be seen in the temporal relationship of the echolalia and the receptive (manual) response. When echolalia was part of the training procedure, the child echoed before he was required to respond manually (although in many instances, the child echoed while manually responding in addition to his previous echo). Thus, the important factor seemed to be when the echolalia occurred.

With this in mind, the reader is asked to look again at Figure 3 and Figure 4 in Experiment 1. Notice that in the echo relevant word condition, for all the children, there was a dramatic initial increase in correct responding. The children did not gradually acquire the response but rather suddenly demonstrated superior performance. This suggests that the children may have known the response in other conditions, but did not perform the response, perhaps because they were not attending. The echolalia that occurred before the receptive response was perhaps serving as a self-imposed discriminative stimulus for the children. The children were presented with discriminative stimuli (object's label) by the experimenter and provided their own. It was only when the self-imposed discriminative stimulus occurred that performance reached and maintained high levels of correct response. Additionally, as Experiment 2 suggests, it perhaps facilitated generalization and maintenance as well. The failure of the children to achieve correct response in all other conditions, especially the two S^D condition, further suggests that the children's response was under the stimulus control of their self-imposed discriminative stimulus and not the experimenter's discriminative stimulus. During this condition, as in trial and error, echolalia did occur, but simultaneous with manual responses (It is interesting to note that the children did not echo the object's label twice). The self-imposed discriminative stimulus perhaps facilitated generalization and maintenance in Experiment 2 as it was a stimulus that was present in both training and generalization settings. When settings maintain the same discriminative stimuli, it becomes harder to discriminate between settings, thus generalization to new settings is enhanced (Johnston & Johnston, 1972; Koegel & Rincover, 1974; Rincover & Koegel, 1975; Stokes & Baer, 1976, 1977; Walker & Buckley, 1972).

Usually it is difficult to ensure that the same

discriminative stimuli are provided in both training and extra-therapy settings. Consequently, discriminative stimuli must be carefully chosen. Language, however, a response that functions also as a stimulus, is perfect as a common stimulus between settings because it can be carried from any training setting to any generalization setting (Stokes & Baer, 1977). Stokes and Baer (1977) call this method of promoting generalization "mediated generalization." The most commonly used mediator is language (i.e., Israel & O'Leary, 1973; Risley & Hart, 1968).

The echolalia in the present investigation may be considered an example of self-mediated generalization because it was a stimulus that was provided by the child, and transported from training to generalization settings (Stokes & Baer, 1977). Additionally, since the probability of echolalia occurring in generalization settings was high, so was the probability of the receptive response that was associated with it. The results of Experiment 2 suggest that this was the case. For the echolalic children, generalization occurred when echolalia was incorporated into task response during training. Low levels of generalization occurred when it was not. The functionally mute children showed poor generalization, regardless of condition, perhaps because they did not echo and thus did not provide their own discriminative stimulus.

It may be suggested that differences in performance of the echolalic and mute children were perhaps due to differences in mental age. Although the echolalic children's MA's were slightly higher than the functionally mute children's MA's (mean = 3.0 years as compared with mean = 2.2 years), this was thought to be a reflection of expressive speech abilities as measured by the standardized tests. Receptive speech was considered equivalent for the echolalic and mute children. Both groups failed the pretest and performed similarly in the no echo condition.

The results of these two studies are far from conclusive. The reader is reminded of the small sample size in these studies. Before any conclusions can be made regarding autistic children in general, further research and replication are necessary. However, the data do hold implications for treatment of autistic youngsters.

Although treatment of autistic children has usually included provisions for the reduction of echolalia (Carr et al., 1975; Freeman, Ritvo, & Miller, 1975; Lovaas et al., 1973; Palyo et al., 1979), the present data suggest that perhaps in certain cases, such as receptive labeling tasks, echolalia should not be eliminated. Perhaps in these cases, echolalia should be taken advantage of and used to promote acquisition and generalization.

One may argue that a child should not be allowed to echo, as echolalia is a bizarre behavior and is indeed one of the characteristics of autism that makes the child appear so abnormal (Ornitz & Ritvo, 1976; J. K. Wing, 1966; L. Wing, 1978). One may, in turn, argue that acquisition and generalization is such a problem for autistic youngsters, that allowing some echolalia during task response would provide benefits that outweigh the disadvantages.

This sort of trade-off between generalization and bizarre verbal behavior does not necessarily have to occur. Indeed an autistic child may appear inappropriate when he echoes "touch your nose" while pointing to his nose. However, the child, when previously taught to touch his or her nose on the command of "nose," would not appear unusual when repeating "nose" before pointing. In fact, that is what many normal children do (Fay, 1967; Fay & Butler, 1968, 1971; Haworth & Menolascino, 1968; Van Riper, 1963). Thus, the teacher or therapist can modify his or her commands when using the child's echolalia in task response to facilitate acquisition and generalization.

Echolalia, then, may be taken advantage of to facilitate acquisition and generalization of receptive labeling. The facilitative role of echolalia in other types of tasks is perhaps more limited. For teaching children commands such as "stand up," "sit down," "turn off the light," echolalia may facilitate the children's learning

of these commands, but call attention to the children's inappropriate verbal behavior in the generalization setting. Further research in this area is needed. Perhaps therapists and teachers could incorporate echolalia into such task response to facilitate acquisition and generalization and subsequently use procedures to eliminate the echolalia (or fade it to a whisper) once a steady rate of generalization had been established.

The use of echolalia in task response to facilitate generalization is an area that holds much promise. Research in this area is certainly needed. This investigation suggests that perhaps in certain tasks (i.e., receptive labeling), echolalia should not be eliminated, but taken advantage of as it may facilitate acquisition and generalization for autistic children.

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