

*GENERALIZATION OF PARENT-TRAINING RESULTS¹*ROBERT L. KOEGEL, T. J. GLAHN, AND GAYLA S. NIEMINEN²UNIVERSITY OF CALIFORNIA, SANTA BARBARA AND
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Two experiments were conducted to assess the generalized effects of several different parent/teacher training programs. In Experiment I it was found that a brief demonstration of how to teach an autistic child new behaviors was sufficient to teach parents how to teach those children those behaviors. However, generalization to new child-target behaviors did not take place. Another parent training program, which did not demonstrate how to teach any one specific child behavior, but was based on teaching the use of general behavior-modification procedures, was effective in teaching the parents how to teach new child-target behaviors. Experiment II then provided analyses of the individual effects of several components of the generalized training program. The results showed that videotape illustrations of the procedures, without the presence of a master teacher, were sufficient to teach the adults. However, sub-parts of the videotapes produced highly specific training results, with each component changing corresponding areas of the *adults'* behaviors. Viewing of the entire package was necessary before the adults were able to improve the autistic *children's* behaviors. The study as a whole suggests the importance of obtaining multiple measures of the effects of parent and teacher training programs, including measures of acquisition and generalization of both adult and child behaviors.

DESCRIPTORS: observational learning, generalization, parent training, teacher training, training programs, autistic children

In recent years, increasing emphasis has been placed on developing techniques for teaching behavior-modification procedures to significant persons in a child's natural environment (Tharp and Wetzel, 1969). There is now a growing body of literature devoted to topics such as teacher training (Kazdin and Moyer, 1976), parent training (*cf.* Becker, 1971; Patterson and Gullion, 1968), and training psychiatric nurses (Wallace, Davis, Liberman, and Baker, 1973). Several ef-

fective areas of diversified training techniques have been studied. Areas emphasized include instructional methods (Gardner, 1972; Hall, 1972; Katz, Johnson, and Gelfand, 1972; Paul, McInnis, and Mariotto, 1973); the use of verbal or written feedback (Cooper, Thomson, and Baer, 1970; Cossairt, Hall, and Hopkins, 1973; Gage 1963; Panyon, Boozer, and Morris, 1970; McNamara, 1971); the use of social reinforcement (Brown, Montgomery, and Barclay, 1969; McDonald, 1973); the use of token reinforcement (Breyer and Allen, Note 1; Bricker, Morgan, and Grabowski, 1972; Katz *et al.*, 1972; McNamara, 1971; Pomerleau, Bobrove, and Smith, 1973); and the use of modelling procedures (Engelin, Knutson, Laughy, and Garlington, 1968; Ringer, 1973). While not all techniques have proven successful, it is fair to say that a considerable number of procedures have been demonstrated to be effective for training both professionals and paraprofessionals. With

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such a large number of methods being used, it becomes increasingly important to evaluate specific procedures in terms of their possible differential effects in different areas of adult and/or child behavior. Two areas of learning that particularly merit consideration are maintenance and generalization.

Maintenance. For example, certain training techniques may produce large initial changes in parent or teacher behavior, but do not seem to produce durable results (*cf.* Kazdin and Moyer, 1977). In many cases, it has been necessary to implement procedures such as the use of intermittent reinforcement (Cossairt *et al.*, 1973), equation of stimulus conditions (Walker and Buckley, 1972), peer contingencies (*cf.* Martin, 1972), or self-monitoring (*cf.* Herbert and Baer, 1972) in order to produce training results that will be maintained over time.

Generalization. Less attention has been given to the questions of stimulus and response generalization. That is, will a technique taught to a teacher or parent be effective with different children or new behaviors? This question seems particularly important when one considers that, with many types of childhood disorders, the parents and teachers are likely to be faced with a variety of different types of target behaviors after they have completed training. It is usually implied that such generalized training results will occur. For example, after the parents of an autistic child complete a parent-training program, they may become involved in teaching their child a large number of new behaviors ranging from tying shoes to learning pronouns. There is some reason to feel optimistic that such parent training programs might be devised. As Kazdin and Moyer (1976) pointed out, training programs that combine a number of procedures may have the potential to produce results that no one procedure would accomplish individually. For example, one portion of such a package may influence acquisition, another portion may influence generalization, *etc.* In at least one instance, a training program using multiple training procedures has

shown results suggesting that generalization from training occurs (Koegel, Russo, and Rincover, 1977).

EXPERIMENT I

This experiment was conducted to determine (a) whether or not parents of children with multiple problems could be trained in a manner that would allow them to work on a variety of different target behaviors, and (b) to determine whether or not two different training programs (which were initially successful) might, however, be differentially successful with respect to generalized applicability across child behaviors encountered after training. Each training program was based on procedures described in previous published research (Koegel *et al.*, 1977; Lovaas, Koegel, Simmons, and Long, 1973; Schreibman and Koegel, 1975). The first procedure was designed to teach the parents how to teach their child specific target behaviors. The other procedure was designed to maximize the probability of generalization across child-target behaviors, but did not specifically teach the parents how to train any one specific child-target behavior.

METHOD

Subjects and Setting

Four adults participated; all were mothers of autistic children. They ranged in age from 24 yr to 35 yr, and all had completed at least a high-school education. At the time of this study, no parent had any formal training in behavior modification or autism. These parents were not randomly selected, but were the first four parents to request training through our project after the conceptualization of this study. No parent was refused training, and there were no drop-outs after training began.

Seven autistic children, selected from the pool of children attending our experimental classrooms, also participated. Three were sons or daughters of the parents described above, and

the others were selected to provide a range of target behaviors that the parent of an autistic child might encounter. The target behaviors for these children are described in Table 1. The children ranged from 4 to 13 yr. They were either mute or echolalic, with almost no communicative speech. They evidenced minimal self-help behaviors, and frequently engaged in tantrum and self-stimulatory behaviors.

During each measurement session, one parent was seated facing one child at a 50 by 50 cm table. All the stimuli necessary to teach the be-

havior assigned (described in Table 1) and a supply of food reinforcers were present on the table.

Design

A multiresponse baseline design (Birnbauer, Peterson, and Solnick, 1974) was used to assess the initial acquisition and generalization of skills acquired through the two different parent training programs.

For a predetermined number of sessions (2 through 8), each mother attempted to teach randomly assigned behaviors to autistic children. Initially, a parent attempted to teach a child *alone* (i.e., without training). If the parent was unsuccessful, then she was trained through the brief demonstration procedure, described below, to teach that given target behavior to the child. The parent was then asked to attempt to teach the behavior. If successful on this attempt, then a new behavior was assigned for the parent to teach alone (i.e., without further training). Again, if the parent was unsuccessful, a brief training demonstration was provided and the parent was asked again to attempt to teach the behavior.

After the predetermined number of sessions (2 through 8) had been completed, the parents were given training with the other training procedure, described below. This procedure was designed to maximize the probability of generalization for a variety of child-target behaviors. After this training, the parents were again asked to attempt to teach a number of behaviors. As in the preceding sessions, if they were unsuccessful, further training would be provided, and they would again be asked to attempt to teach the behavior. Parents completed participation in the study if they successfully taught three successive behaviors without any intervening training. This would suggest that the parent was using a general set of skills that were functional for teaching a variety of behaviors.

Child-target behaviors. In general, target behaviors were selected according to the individual child's level of skill. A list of target behaviors felt to be appropriate for each given child was

Table 1
List of Behaviors and Children in Experiment I

Parent	Child	Session	Behavior
Parent 1	6	Task 1	Stand up
	6	Task 2	Touch spoon
	6	Task 3	Put on coat
	6	Task 4	Imitation—clapping hands
	6	Task 5	Ordered stacking of red, white, and blue blocks
	6	Task 6	Touch cup
	6	Task 7	Come here
Parent 2	4	Task 1	Discrimination—first <i>versus</i> last
	3	Task 2	Draw a triangle
	5	Task 3	Discrimination—around <i>versus</i> through
	2	Task 4	Touch star
	4	Task 5	Discrimination—penny <i>versus</i> nickel
	3	Task 6	Discrimination—corn <i>versus</i> apple
Parent 3	2	Task 1	Discrimination—short <i>versus</i> long
	5	Task 2	Ordered stacking of red, white, and blue blocks
	3	Task 3	Discrimination—on top <i>versus</i> beside
	2	Task 4	Discrimination—plain <i>versus</i> striped
	4	Task 5	Discrimination—purple <i>versus</i> blue
Parent 4	1	Task 1	Discrimination—blue <i>versus</i> yellow
	1	Task 2	Touch middle
	1	Task 3	Discrimination—near <i>versus</i> far
	1	Task 4	Discrimination—square <i>versus</i> circle

prepared, before the investigation began, by each child's parents and teachers. Child-target behavior combinations could then be randomly assigned to specific sessions in this experiment. In any given session, one parent worked with one child on a target behavior randomly selected from that child's list. The complete list is provided in Table 1.

Parent-training programs. During the first sessions, any parent who could not successfully teach a particular child-target behavior was given training for teaching that particular child-target behavior. The parent-trainer was a graduate student with 2 yr apprenticeship experience using behavior modification with autistic children. The procedure was based primarily on the provision of a brief demonstration by the parent-trainer of how to teach that specific behavior. The demonstration lasted 10 to 15 min and consisted of five complete trials. Each trial began with the parent-trainer demonstrating how to deliver an instruction to the child, and ended with the parent-trainer demonstrating how to consequence the child's response. Correct child responses were shown as consequted with candy reinforcers. Incorrect child responses were shown as ignored, and then demonstrations of prompting correct child responses were provided on subsequent trials. A child's approximation of a correct response was shown as reinforced with a shaping procedure. If a parent asked a question regarding this demonstration, a specific answer was given with respect to only the child-target behavior involved in this demonstration.

The other parent-training procedure was not directed toward any of the child-target behaviors involved in this experiment. Rather, it was based on a variety of procedures designed with the intent of teaching a general set of skills, which might be effective with a variety of children and behaviors (*cf.* Kazdin and Moyer, 1976; Koegel, *et al.*, 1977). The training began with three 30-min lectures on the procedures outlined below (in the measurement section), and described in detail elsewhere (Koegel *et al.*, 1977). The

following five categories were included: (1) the use of discrete trials, (2) presentation of S^D's, (3) use of prompts, (4) use of shaping, and (5) use of consequences. Following the lectures, the parents observed two 37-min videotapes showing examples of these procedures used with child-target behaviors other than those involved in this study. The tapes showed two or three illustrations of the correct and incorrect use of each part (S^D, prompt, consequence) of a discrete trial, in addition to two or three illustrations of shaping. These illustrations were shown with a total of up to three children and three therapists in order to maximize the probability that the parents would learn a generalized set of rules.

Measurement. During each session, the parents' behavior was measured in five different areas (S^D presentation, use of prompts, use of shaping, use of consequences, and use of discrete trials). Further, in order to assess the validity of these procedures for teaching these particular children during these particular sessions, the children's behavior was recorded in terms of whether or not their per cent of correct responses showed any improvement through each specific session. This measurement is described in detail below.

Parent behavior. The parents' behavior was recorded in each of the following five areas, with the respective scoring instructions given to the observers.

Scoring Instructions

Observe a session for 30 seconds, then score while the session continues for the next 30 seconds.

Use the definitions given below to make a decision about the adequacy of each aspect being assessed. If you do not see an S^D, etc., in a given period, write the initials "NA" in the blank.

S^D's:

1. The S^D should be clear and *discriminable*; that is, it should stand apart from anything else that the parent says. A good S^D

has a distinct beginning and a distinct end.
 2. The S^D should be *appropriate* to the task. If the parent is teaching S to point to a red card, he should not mistakenly say, "point to the blue card," or "hand me the red card."

3. The S^D should be *consistent* with that given on the previous trial. Exception: The S^D can appropriately vary when a discrimination task is being taught, and the child has reached criterion on each of the individual stimulus items.

4. The S^D should be *uninterrupted*.

5. When the S^D is presented, the child should be *attending*. The child should not be engaging in off-task behavior. The child should be sitting quietly, not engaged in any overtly disruptive behavior when the verbal component of the S^D is presented. The child should be looking either at the task at hand or at the parent.

Prompts

1. The prompt must be *effective*; that is, it must evoke a correct response.

2. The prompts must occur in temporal relation to the S^D.

Shaping

1. Shaping involves the correct reinforcement of successive approximations. In order to have a good shaping procedure, each reinforced response should be at least as good as the last one. (Score shaping with reference to responses actually observed during the scoring period.)

Consequences

1. Consequences should be delivered *immediately* after the response. Immediately is defined as within three seconds.

2. Consequences should be *contingent*; that is, reinforcement only for correct responses, and non-reinforcement or punishment only for incorrect responses.

3. The consequences should be *unambiguous*. A "No" said with a smile or a "Good boy" given with a frown are ambiguous.

4. Consequences should be *consistent*. Reinforcement should follow each correct response, unless the child has reached an advanced level, in which case the reinforcement may be scheduled. Once the parent begins to punish, she should punish consistently.

5. Consequences should be *effective*. They should be tailored to each child. Reinforcements should be something the child is eager for, and punishments something the child attempts to avoid.

Discrete Trials

1. The session should consist of *discrete trials*; that is, trials which have a distinct beginning and end, and a discrete inter-trial interval. An inter-trial interval consists of a small period of time in which no on-task responding is required of the child.

Raters scored each of the five categories for each 30-sec period as "Correct" (fulfilled all aspects of the definition of the technique for all of the trials occurring in that interval), "Incorrect" (did not fulfill the definition in some way during any trial(s) within the interval), or "NA" (not applicable—technique was not observed in the 30-sec period).

At the end of the session, a percentage score was obtained of correct use of each of the five categories. The scores were obtained as follows:

$$\text{Per cent Correct} = \frac{\text{Number of 30-sec intervals in which "Correct" was scored}}{\text{Total number of scored intervals in session}}$$

(Note: "Scored intervals" were those in which "Correct" or "Incorrect" was scored. Intervals scored "NA" were omitted.) The average of the five scores was then computed in order to give an overall index of the parent's behavior during each session. Parent scores are thus expressions of the proportion of time during the session in which the parent was using the given procedure correctly.

Measurement of the child's performance. In each session, continuous data were recorded on the correctness of the child's performance of the target behavior. On each trial, an observer recorded whether the child's response was correct, incorrect, prompted, or an approximation of the target behavior.

In addition to these trial-by-trial measures of student improvement, we obtained a summary measure of whether or not a child was learning in each session. A "+" was recorded if the child's responses during the last 10 trials of the session were improved (*i.e.*, a higher percentage of correct responses) as compared to the first 10 trials of the session. Conversely, a "-" was recorded if responses during the last 10 trials showed no improvement, or a deterioration, when compared to the first 10 trials.

Reliability. Reliability of the parents' correct use of behavior-modification procedures was assessed according to the following procedure. Two observers independently (with data sheets shielded from each other's sight) recorded data for all sessions in this experiment. To control for any possible observer drift as a function of familiarity with the experiment, two naive observers independently recorded data from each videotaped session shown to them in randomized order. Percentage of agreement was calculated by dividing agreement (identical scores for each pair of observers for a given 30-sec interval) by the total number of agreements plus disagreements for the total session. The mean per cent effective agreement (excluding recordings in the "not applicable" category) for these 32 sessions was 92%, with a range of 85% to 100%.

For child responses, one familiar and one naive observer independently and continuously recorded the child's behavior in each of the 32 sessions. The observers were in agreement if, for a given block of 10 trials, they recorded exactly the same per cent of unprompted correct responses. Reliability was calculated by dividing the number of agreements by the number of agreements plus disagreements per session. The mean reliability for these measures was 93%,

with a range of 88% to 99%. For the summary (improvement *versus* no improvement) measure recorded for the child's behavior in each of these sessions, these observers were in complete agreement.

RESULTS

Figure 1 shows the results for all four parents. The average per cent correct use of the five behavior-modification procedures is plotted on the ordinate. Tasks are shown on the abscissa. Examining the top graph first, one can see that for the first task this parent was using the procedures at a level of only 10% correct. This minus (-) indicates that the child showed no improvement in correct response from the first 10 trials to the last 10 of this session. Therefore, this parent was given training in how to teach the child through the brief demonstration procedure described above. Following this training, the figure shows that the parent increased her correct use of the procedures to 97%. The plus (+) indicates that the child's level of correct response increased from the first 10 to the last 10 trials of this session.

The parent was then asked to work on Task 2. The figure shows that there was little, if any, generalization. That is, her per cent use of the procedures was again very low (42%), and the child did not show any improvement (-) during the session. Following the subsequent brief demonstration, the parent again used the procedures correctly (90%), and the child again showed improvement (+).

These results were replicated with Tasks 3 and 4. In each case, the parent showed no generalization, but required additional demonstrations aimed directly at teaching the task at hand.

Following the multiple-baseline design, after Task 4 the parent was given training aimed at teaching the five general procedures, without any direct training on the tasks in this experiment. As can be seen in the figure, the parent's correct use of each of the procedures on the three tasks (5, 6, and 7) following this training was very high: 95%, 93%, and 98% respectively, with-

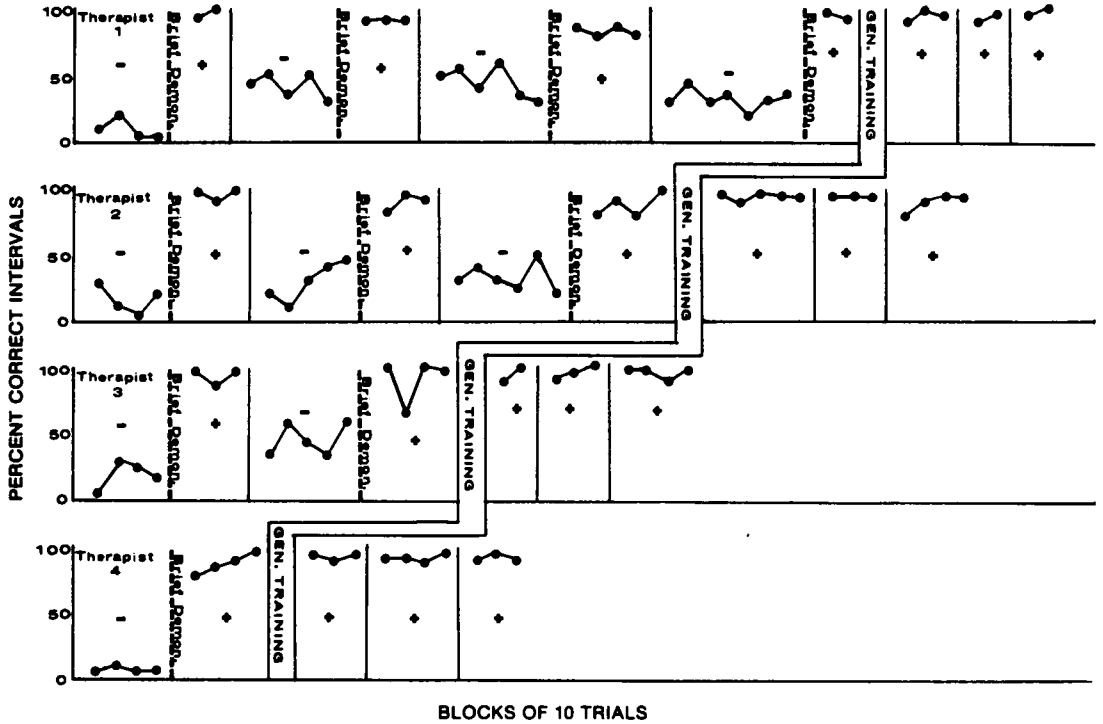


Fig. 1. Therapists' per cent correct use of behavior-modification procedures during each condition in Experiment I: during baseline, following a brief demonstration, and following generalization training. Solid vertical lines indicate introduction of a new task. The corresponding child behavior for each task is noted by a "+" (for improved correct responding from the first to the last 10 trials) or a "-" (for deterioration or no improvement).

out need for further training. Further, in each session the child's behavior improved. That is, the parent appeared to have learned a generalized set of procedures that were effective across child-target behaviors.

The graphs for the next three parents show similar results. That is, in each case the parents used the procedures at a low level without training of any kind. Also, as indicated by the minus signs, the children did not learn during these sessions. After each brief demonstration of how to teach each specific task, every parent improved on her use of the procedures, and every child learned. However, there was essentially no generalization to new tasks. Brief demonstrations were required for every task before each parent could teach effectively.

Also, in each case, following training in the general rules, each parent taught the next three tasks effectively, and therefore was considered to

be using a generally effective set of procedures.

In summary, these results show that both training procedures were effective with respect to the initial acquisition of the parents' skills. However, only one parent-training procedure was effective for teaching a general set of skills, effective across multiple children and target behaviors.

EXPERIMENT II

The purpose of this experiment was to examine the influence of several components of the generalized training procedure used in the above experiment. Experiment II involved exposure to the two videotapes separately, rather than as a package, as was the case in Experiment I. As stated above, one videotape focused on the adults' use of antecedent stimuli (S^D presentation, prompts, and trial beginning), and the

other tape focused on the use of consequences (rewards, punishments, shaping). The major questions addressed were: (1) could observation of videotape examples alone, without a master teacher, lectures, or the opportunity to ask questions, also train people in the generalized use of behavior modification with autistic children?, and (2) is training in the use of both antecedent and consequent stimuli necessary?

METHOD

Subjects

The subjects, referred to here as therapists, were three adults of varying backgrounds who requested training in behavior-modification skills for a variety of reasons. The first subject had a standard California teaching credential and hoped to become a volunteer teacher in an experimental classroom for autistic children at the University of California at Santa Barbara. He had no previous training in behavior modification. The second subject was the foster mother of an autistic child who was enrolled in the experimental classroom, and although she had no previous instruction in behavior modification, she had informally observed the classroom. The third subject was an undergraduate student majoring in anthropology who had no previous training in behavior-modification techniques.

Six autistic children also participated. They were five boys and one girl, ranging in age from 8 to 13 yr. Two were mute; the rest were echolalic with limited repertoires of appropriate verbal behavior. All exhibited various self-stimulatory behaviors such as clapping hands, waving arms, twirling objects, shrieking, shouting.

The setting and selection of tasks and dependent variables (both adult and child behaviors) were essentially the same as those in Experiment I.

Procedure

The experiment consisted of nine 30-min sessions per therapist. In each session, the therapists

attempted to teach an appropriate behavior to one of the six autistic children. Table 2 shows the eight behaviors chosen for each child before the experiment began.

As in Experiment I, the particular child-target behavior taught in each session was randomly determined before the start of the experiment. The ninth session was, however, designed to duplicate the first session, both with respect to the behavior taught and the child involved. Table 3 shows the list of children and behaviors for each session.

Each 30-min session was videotaped on a time-sample basis, yielding 15 min of tape: either six alternating 5-min periods on- and off-camera, or four alternating periods of 7.5 min on and off, as determined randomly before the experiment began.

Written instructions were given to the therapists describing the tasks for each session. If further directions were sought, the therapists were told to use their own judgement in further defining the task they were to teach.

Design. A multiple response baseline design was used, with therapists remaining on baseline for different numbers of sessions before beginning training on each of the two separate parts of the program. The baselines for the three therapists ranged from two to five sessions in length. During training, the therapists also viewed the tapes at different times and in different orders, some seeing the tape on the use of antecedent stimuli first, some seeing the tape on the use of consequences first, as described in Table 3. A manual paraphrasing the script of each tape was given to the therapist at the time he or she viewed each tape, and the therapist was allowed to keep this manual for later reference.

Data recording. Raters observed 30 sec of a session, then recorded their assessments as another 30 sec elapsed. They scored each of the five categories for each 30-sec period as "Yes" (fulfilled all aspects of the definition of the technique), "No" (did not fulfill the definition in some way), or "NA" (not applicable—technique was not observed in the 30-sec period).

Table 2
Autistic Children and Behaviors in Experiment II

<i>Child 1:</i>	<i>Child 4:</i>
(1) Write "name"	(1) Comparisons (big, bigger, biggest)
(2) Same and different	(2) Coins (names and values)
(3) Discriminating unusual shapes	(3) Opposites (right <i>versus</i> left)
(4) Prepositions (in <i>versus</i> on <i>versus</i> under)	(4) Same and different
(5) Counting	(5) Writing
(6) Comparisons (big, bigger, biggest)	(6) Preposition (between)
(7) Opposites (right-left)	(7) Discrimination of patterns
(8) Lotto game (matching)	(8) Counting by 2's
<i>Child 2:</i>	<i>Child 5:</i>
(1) Same and different	(1) Discrimination of patterns
(2) Opposites	(2) Prepositions (behind <i>versus</i> next to)
(3) Counting by 2's/5's/10's	(3) Writing the alphabet
(4) Coins (values and counting)	(4) Combing hair
(5) Discrimination of patterns	(5) Tie shoes
(6) Prepositions (above <i>versus</i> around <i>versus</i> through)	(6) Counting objects
(7) Prepositions (against <i>versus</i> between)	(7) Opposites (right <i>versus</i> left)
(8) Counting backwards	(8) Same and different
<i>Child 3:</i>	<i>Child 6:</i>
(1) Coins (names and values)	(1) Tie shoes
(2) Opposites (above <i>versus</i> below)	(2) Prepositions (in <i>versus</i> on)
(3) Same and different	(3) Discrimination of letters, numbers, shapes
(4) Prepositions (behind <i>versus</i> next to)	(4) Drawing shapes
(5) Opposites (right <i>versus</i> left)	(5) Matching with puzzle
(6) Discriminating patterns	(6) Opposites (up <i>versus</i> down, right <i>versus</i> left)
(7) Counting by 2's	(7) Colors
(8) Writing	(8) Stringing beads

At the end of the tape, a percentage score was obtained of correct use of each of the five categories. The scores were obtained as follows:

$$S^D \text{ score} = \frac{\text{Number of 30-sec intervals in which "Yes" was scored for } S^D\text{s}}{\text{Total "Yes" and "No" intervals scored for } S^D\text{s in session}}$$

Therapist scores are thus expressions of the proportion of scored intervals during the session in which the therapist was using the given procedure correctly. Scores for the four other behavioral procedures were obtained similarly. In addition, the mean of the five techniques was calculated for each session. Child behaviors were recorded in the same manner as in Experiment I.

Observer reliability. Twelve random selections of the 26 videotapes generated within the study were independently scored by two raters; the remaining 14 were scored by one rater or the other.

Agreement between raters was defined as the number of identical scorings on each of the five procedural categories divided by the total number of possible scorings for that category (disregarding the "not applicable" ratings) and multiplied by 100 to obtain a percentage. Interrater agreement for these videotapes ranged from 70% to 100% for the S^D category, with a mean of 91%; from 57% to 100% for the prompts category, with a mean of 82%; from 84% to 100% for the consequences category, with a mean of 94%; and from 94% to 100% for the discrete trials category, with a mean of 97%.

RESULTS

Therapist Performance

Data for the three therapists, showing baseline and posttraining performance of four behavior-modification areas, are presented in Figure 2. The

Table 3
Child and Activity for Each Session in Experiment II

<i>Therapist 1</i> <i>Session</i>		<i>Therapist 2</i> <i>Session</i>		<i>Therapist 3</i> <i>Session</i>	
1	Child 4 Activity 2	1	Child 6 Activity 6a	1	Child 5 Activity 6
2	Child 2 Activity 8 Antecedent Tape Presented	2	Child 1 Activity 4	2	Child 6 Activity 4
3	Child 2 Activity 6a	3	Child 4 Activity 5 Antecedent Tape Presented	3	Consequence Tape Presented Child 3 Activity 3
4	Child 3 Activity 4	4	Child 3 Activity 6	4	Child 3 Activity 1
5	Child 4 Activity 1 Consequence Tape Presented	5	Child 5 Activity 5	5	Antecedent Tape Presented Child 4 Activity 6
6	Child 5 Activity 8	6	Child 2 Activity 4	6	Child 2 Activity 8
7	Child 6 Activity 7	7	Child 1 Activity 5	7	Child 2 Activity 5
8	Child 1 Activity 7	8	Child 5 Activity 3	8	Child 2 Activity 7
9	Child 4 Activity 2	9	Child 6 Activity 6b		

ordinate shows the percentage the procedure was used correctly in the session, for each of the three therapists for each procedure, and baseline and posttraining sessions are shown on the abscissa. The top three groups of graphs show the therapists' use of behavior-modification procedures shown in the "antecedent stimuli" tape; the lower graph shows the therapists' use of behavior-modification procedures shown in the "consequent stimuli" tape.³ The dotted line represents the point at which a given therapist viewed the tape corresponding to the behavior plotted in that graph. During the pretraining sessions, therapist performance was generally low, with an overall mean for all subjects of 24% correct

use of behavior-modification procedures. There was no evidence of consistent correct performance during the pretraining sessions. After training began, all therapists generally showed improvement in their performance in the areas in which they were trained. The overall mean for therapist use of correct procedures after training was 80%.

However, the improvement in therapist performance seemed to be specific to the information presented on each training tape. Figure 2 shows that no consistent correct performance took place in the use of a given behavioral procedure until information on that procedure was provided. The data in all areas except discrete trials are quite clear in this respect. For example, no significant improvement in consequences was seen for any therapist after viewing only the tape on the use of the antecedent stimuli.

In summary, Figure 2 shows that (1) while the level of therapist performance generally was low during the pretraining sessions, all therapists showed improvement after training, and (2) the

³Shaping as a behavioral technique was not used often at any point in this study, and is therefore not plotted. However, when the therapists did use it, their behavior was consistent with the other results. That is, the mean per cent correct use of shaping for all therapists showed improvement only after viewing the relevant videotape. During baseline, correct use of shaping was 11%; after training, the per cent correct use of shaping increased to 96%.

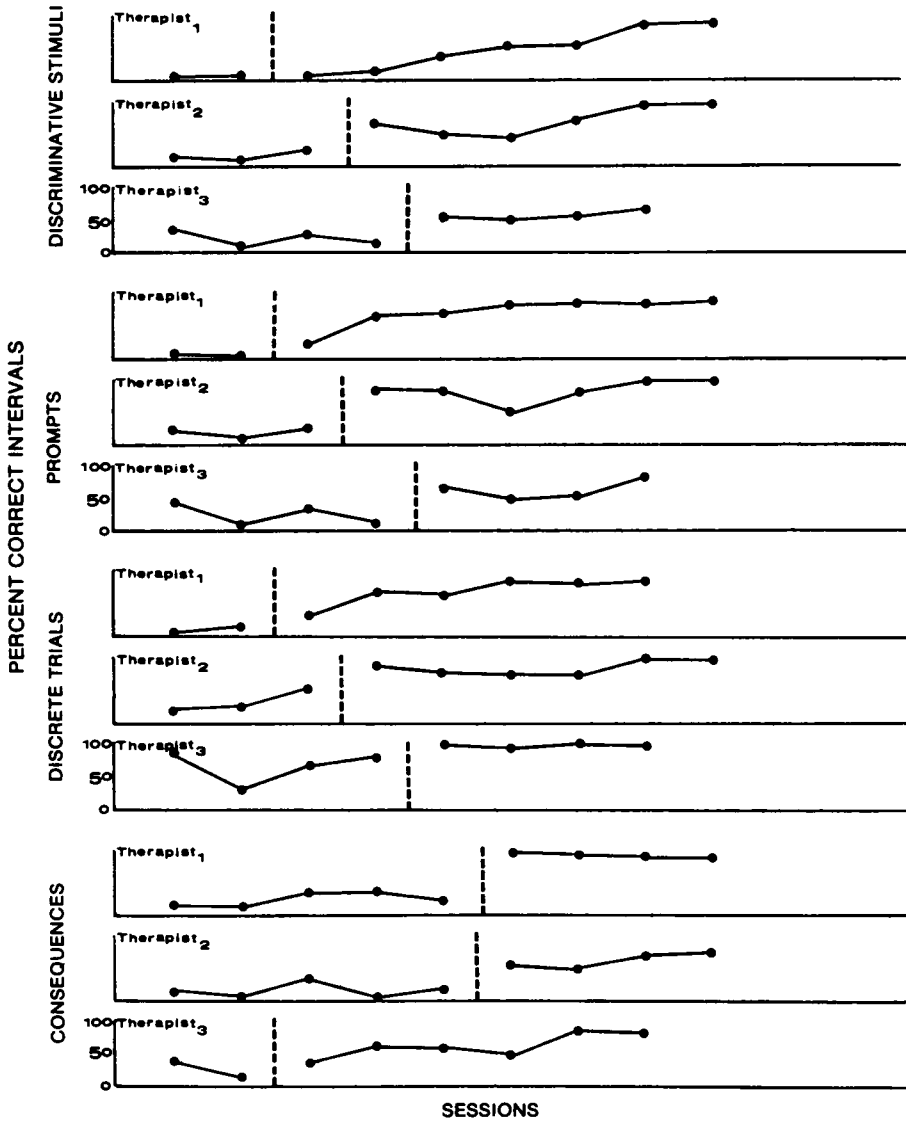


Fig. 2. Therapists' per cent correct use of four specific categories of behavior-modification procedures. The vertical dashed lines represent the viewing of the relevant videotape for each category. The top three categories relate to material presented in one videotape; the bottom category refers to material presented in the other tape.

information contained in the training tapes seemed specific in its effects on therapist performance.

Children's Performance

Figure 3 shows the children's performance for each therapist as a function of the therapist's training. The ordinate shows per cent of un-

prompted correct responses, and blocks of 10 trials are shown on the abscissa. Vertical dashed lines separate the child's behavior for each task. Note that here the data are divided into three categories: "before" (sessions taking place before either tape was shown), "training in antecedents (or consequences) only" (sessions between the viewing of the two tapes), and "after" (sessions after both tapes had been seen).

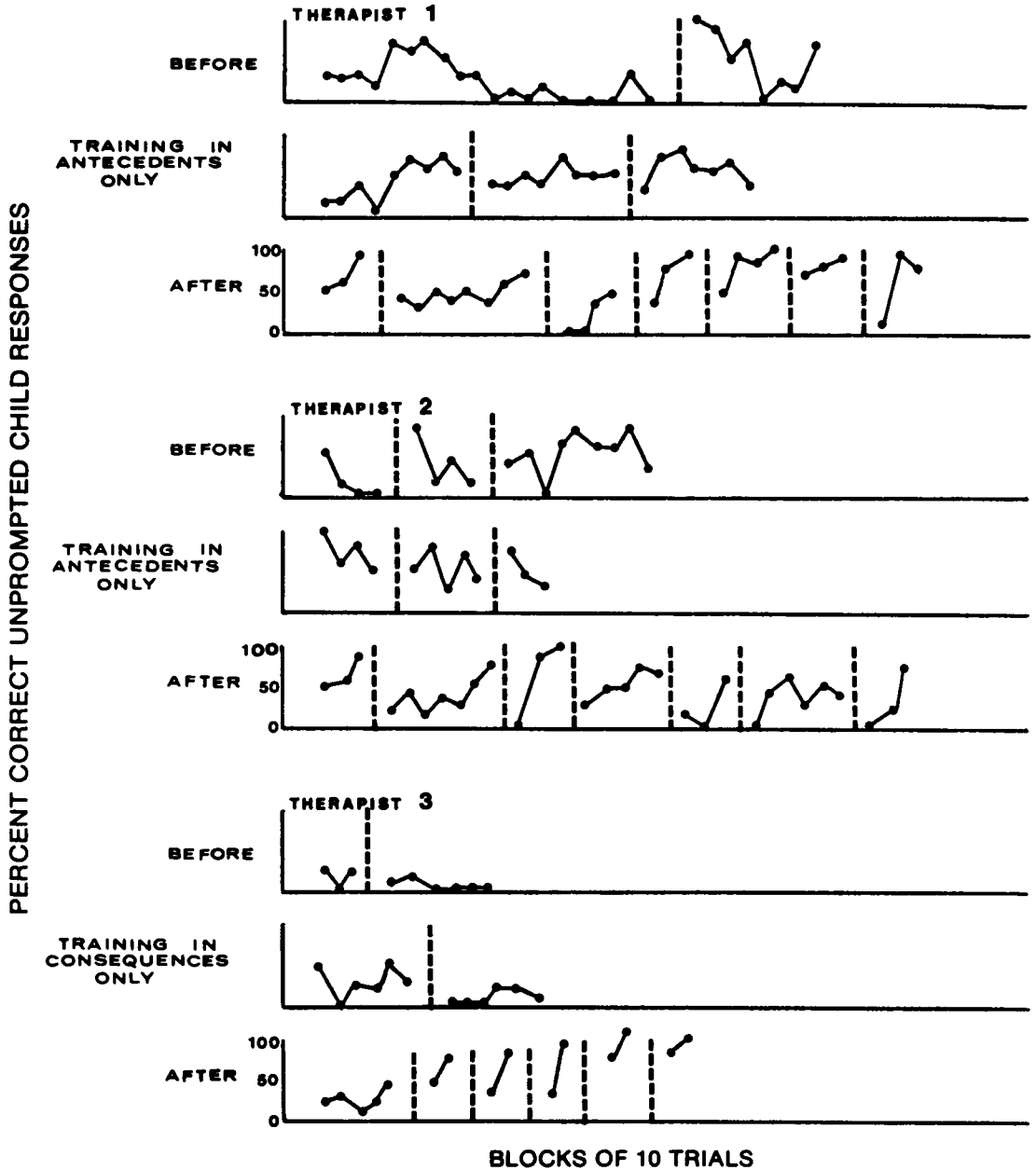


Fig. 3. Child performance during Experiment II. For each of the three therapists, the top graph shows child performance before the therapist had any training, the middle graph shows child performance when the therapist had observed only one of the training tapes, and the bottom graph shows child performance after the therapists had observed both training tapes. The dashed vertical lines separate the child's performance on each task.

No overall improvement was noted in children's performance during the pretraining period. The influence of an untrained therapist usually resulted in erratic responding or a decrement in child performance; no consistent learning was

demonstrated. After the adults viewed both tapes, the children showed consistent increases in their number of correct responses throughout the sessions. However, in no case was a therapist able consistently to improve a child's behavior

after having viewed only one of the videotapes, either on antecedent stimuli or on consequences.

In summary, the results of Experiment II suggest that:

(a) untrained people do not produce reliable improvement in the behavior of autistic children; that is, some form of training appears necessary to enable parents and therapists to work effectively with such children;

(b) the total package that was developed to train individuals to work with autistic children without requiring the presence of a master teacher proved efficient and effective across children and target behaviors; and

(c) although the adults improved in specific areas after viewing each tape, in order to produce reliable improvement in the behavior of the autistic children, it was necessary to include training in both antecedent and consequent stimuli.

GENERAL DISCUSSION

Perhaps the major point made by these experiments is that training programs can produce differential improvement in one or more areas of both adult mediators teaching skills and in the behavior of targeted children (*cf.* Bandura, 1969, 1976; Koegel and Rincover, 1977). For example, some components of training may result in changes in some of an adult mediator's behavior (*e.g.*, the use of consequences), yet this change may not influence the adult's ability to change a child's behavior. Similarly, even if the adult's behavior changes *and* this change results in the adult's ability to change a child's behavior, this still may not mean that the adult could work effectively with other children or other behaviors. In essence, we are saying that training programs may have either very limited or very broad results, and that there is a need to obtain multiple measures in order to assess effectiveness truly. We are not implying that the measures included in this study are all-inclusive. In fact, it is quite likely that other areas also may have been influenced. For example, once a parent was trained, it is possible that this training may have influ-

enced other family interactions besides those involving the target child. These experiments imply that future research in parent and professional training should be directed toward broader examination of the results.

Generalized Training

The results suggest some interesting points concerning the content of generalized training programs. In the experiments, knowledge of antecedent stimulus control was not enough to produce a generally effective therapist for autistic children; knowledge of reinforcement and shaping alone was not sufficient either. At this point, it is difficult to pinpoint precisely the important variables that influenced the generalized effectiveness of the videotape package. The final training program was a broad one, dealing with at least the following:

(1) the use of specific instructions in stimulus control, shaping, consequences, and the use of discrete trials;

(2) a visual and auditory model of correct procedures;

(3) the use of both correct and incorrect examples; and

(4) practice over time after observing the videotapes.

Further research is needed to examine separately such variables.

It may be that not all of the above variables are necessary for highly generalized results. Experiment II showed that the lengthy lectures used in Experiment I were probably unnecessary. Perhaps some components of the training in Experiment II were also unnecessary. The major purpose of this study, however, was not to identify the ultimate or most elegant training program. The major purpose was to point out that different components within a parent or teacher training program may be responsible for different specific results, and that different measures may lead to different conclusions regarding effectiveness.

Along these latter lines, in this study we did not measure data such as adults' attitudes toward themselves or toward the children (*cf.* Karoly and Rosenthal, 1977). It was our impression, however, that the different training programs may have differentially affected such attitudes. Anecdotally, the parents trained with a parent-trainer seemed more confident than those trained with videotapes alone. Such measures may be important for future research, since differences in attitude could conceivably affect the adults' use of the procedures or even their willingness to work with the children. If so, then differences in followup results might also be noted. We are emphasizing here that both the data and our impressions suggest that various portions of parent and therapist training packages may differentially influence widespread areas of the total family's or class' behavior, and that multiple measures may be important in evaluating the package.

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