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TEACHING GENERATIVE USE OF SENTENCE ANSWERS TO THREE FORMS OF QUESTIONS[1]

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Three retarded and four economically disadvantaged children were taught, through modelling and reinforcement procedures, to produce complete sentences in response to three types of questions involving changes in verb inflections. To evaluate generalization of training, new but similar questions were periodically asked, answers to which were never modelled or reinforced. Modelling and reinforcement effectively taught correct sentence answers to training questions and produced new sentence answers to questions for which no specific training had been given.

DESCRIPTORS: disadvantaged children, speech deficiency, generalization of verbal responses, generative grammar, language, retardates, stimulus control, imitation

Although the occurrence of new, rule-governed language has been consistently observed in the spontaneous speech of normal children (*e.g.,* Brown and Bellugi, 1964; Ervin, 1964; McNeill, 1966), only recently have training procedures to produce this type of language in speech-deficient children been investigated. In an early study, Guess, Sailor, Rutherford, and Baer (1968) taught a retarded child, through modelling and differential reinforcement, to label single objects and pairs of those objects. After the child was trained to use the singular and plural labels appropriately for a number of objects, she began to use correct singular and plural labels for new objects. Guess *et al.* demonstrated experimental control over the child's generative language by using the same procedure to establish a reversed labelling pattern (*e.g.,* "forks" when shown a fork and "clip" when shown a pair of clips).

The use of modelling and reinforcement to establish generative language has been replicated and extended across several language classes: descriptive adjectives in spontaneous speech of disadvantaged preschoolers (Hart and Risley, 1968); receptive and productive generative plurality (Guess, 1969; Guess and Baer, 1973); past and present tense verb inflections (Schumaker and Sherman, 1970); complete sentence usage in a retarded child who initially spoke in "telegraphic" English (Wheeler and Sulzer, 1970); adjectival inflections within a receptive language repertoire (Baer and Guess, 1971); appropriate generative use of plural allomorphs (Sailor, 1971); and the use of singular and plural sentences in a child ini-

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tially lacking complete sentence usage (Garcia, Guess, and Byrnes, 1973). Zimmerman and Rosenthal (1974) provided a comprehensive review of studies that used modelling alone or in combination with other procedures to produce in children a variety of rule-governed behaviors, including language.

In the studies cited above, the verbal responses trained were relatively short. The present study, as well as the Lutzker and Sherman (1974) study, was designed to teach complete sentences involving various verb usage. Lutzker and Sherman taught children descriptive sentences using "is" or "are", depending on whether a picture portrayed one or more actors engaged in an activity (*i.e.,* "The boy *is* running." "The ducks *are* swimming.") Training resulted in a generative repertorie where correct singular or plural descriptive sentences were used to describe new pictures on which the children had not received training.

In the present experiment, modelling and reinforcement were used to establish a generative verbal repertoire of complete sentences in response to verbal rather than visual stimuli. Children were trained across three different question forms, the answers to each involving a different verb transformation. The children were periodically tested with new stimulus items. Answers to these new items were not modelled or reinforced.

METHOD

Subjects and Settings

Three retarded children from the Kansas Neurological Institute in Topeka, Kansas, and four economically disadvantaged children at the Unity Day Care Center in Lawrence, Kansas, served as subjects. The medical records showed the following diagnoses for the retarded children. Kent was a 17-yr-old boy, diagnosed as retarded due to unknown prenatal influences (I.Q. of 33). Sherry, a blind, retarded 16-yr-old was described as echoic. Her blindness and retardation were attributed to premature birth (I.Q. of 43). Alex was a 15-yr-old boy, diagnosed as mongoloid (I.Q. of 45). The economically disadvantaged children were of the following ages: Greg, 3 yr, 6 mo; Martin, 4 yr, 2 mo; Sean, 4 yr, 7 mo; and Marjorie, 4 yr, 2 mo.

According to cottage parents and teachers, all seven children had limited speech but articulated some words or phrases clearly. During individual prescreening sessions, these children (a) had intelligible articulation of both imitative and spontaneous verbalization; (b) imitated words and, in some cases, phrases or sentences; and (c) displayed limited or nonexistent use of past and future tense verb forms in their speech when asked about everyday events.

Each child was seen individually once or twice a day (Monday through Friday) for 20 to 30 min in an experimental session. The experimenter and the child sat in a small room facing each other beside a table.

Verbal Responses Tested and Trained

The verbal responses tested and trained were complete sentence answers to three different forms of questions. (See Table 1 which provides an example of each statement-question form and the corresponding answer form.) Except for substitution of different stimulus items (see Table 2), the statement preceding the question was always the same. The generative stimulus items were presented only during tests and were not reinforced. Training items were used in both training and testing and were intermittently reinforced.

Training Procedures

Each child was trained to respond with complete sentences to three forms of questions. Reinforcement consisted of (a) praise (*e.g.,* "Good!" "That's great!"); (b) a small bite of food (ice cream, peanuts, M&Ms); and (c) placing a mark on a piece of paper. The marks were used as tokens to earn toys. (Sixty marks were redeemable for a toy valued from $0.39 to $1.79.)

Table 1

Statement-Question Forms and Corresponding Answer Forms

Form A		
Experimenter:	He is a *baker.*	(statement including stimulus item)
Experimenter:	What did he do yesterday?	(question—past tense)
Child:	Yesterday he *baked.*	(answer—stimulus item with /t/ inflection)
Form B		
Experimenter:	He is a *baker.*	(statement including stimulus item)
Experimenter:	What will he do tomorrow?	(question—future tense)
Child:	Tomorrow he will *bake.*	(answer—stimulus item with no specific inflection)
Form C		
Experimenter:	He is a *baker.*	(statement including stimulus item)
Experimenter:	What is his job?	(question)
Child:	His job is *baking.*	(answer—stimulus item with /ing/ inflection)

To ensure that the children could pronounce all stimulus items (Table 2) they were trained, before testing, to imitate each word, with reinforcement scheduled for only some correct imitations.

Training question-answering behavior: answer under imitative control. Each time training began on a new form of question, the answer was first established under imitative control, using the first stimulus item, "ranch". Each word of the answer was modelled separately, and each word imitated correctly was reinforced. Over trials, reinforcement was made contingent on correctly imitating the entire sequence, one word at a time. Then, the answer was modelled with the first two words grouped and the remainder modelled singly; then, the first three words were grouped and the remainder modelled singly. Training continued until the entire answer was modelled as a complete sentence and 12 consecutive answers were imitated correctly. Throughout training, each incorrect response (or no response for 5 sec) was followed by the experimenter saying "No" and a timeout period. During timeout, the experimenter turned her head away from the child and froze for 3 to 5 sec, after which the sequence was begun again from the first word (McReynolds, 1969; Risley and Wolf, 1967).

Training question-answering behavior: answer under control of statement-question. Once the answer was imitated correctly, it was brought under control of the statement-question. At first, the experimenter said the statement (*e.g.,* "He is a worker."), asked the question (*e.g.,* "What did he do yesterday?"), modelled the complete answer (*e.g.,* "Yesterday he worked."), and reinforced correct imitation of the answer. To discourage the child's imitating the statement and question, the experimenter at first spoke them softly and quickly and then gradually over trials spoke them more normally. Again, correct imitations of the answer were reinforced. This training stopped after six consecutive correct imitations in which the experimenter presented, in a normal voice, the statement-question and the model of the answer.

The next step involved "fading out" the model of the answer. The experimenter presented the statement-question and, gradually over trials, modelled fewer words by omitting them from the end of the answer. Now the child was rewarded for saying the complete answer as the model of the answer was faded out. This training stopped when six consecutive correct answers were given to the statement-question.

Throughout both steps of this training, each incorrect response produced "No" and a model of the correct answer. If the subject then imitated the modelled answer he was praised. If he did not correctly imitate the modelled answer, the experimenter again said "No", applied time-

Table 2

List of Stimulus Items Employed[2]

Generative Stimulus Items (Used Only in Tests)	
1. preach	6. build
2. help	7. talk
3. dance	8. truck
4. pitch	9. bake
5. jump	

Training Stimulus Items (Used in Training and Tests)	
1. ranch	25. touch
2. bank	26. rope
3. ask	27. poach
4. watch	28. gas
5. stamp	29. smack
6. fix	30. mask
7. chop	31. pass
8. hike	32. smoke
9. fish	33. camp
10. look	34. work
11. stop	35. clap
12. golf	36. push
13. back	37. kiss
14. cross	38. laugh
15. slip	39. dress
16. wink	40. scoop
17. pace	41. surf
18. rack	42. stoop
19. trap	43. squash
20. attack	44. book
21. walk	45. cough
22. pack	46. tap
23. cook	47. brush
24. pick	48. fence

[2]Due to the large number of stimulus items needed, the selection of these stimulus item words was somewhat arbitrary. The criterion was that the word took a /t/ ending to form its past tense (*e.g.*, baker, baked, baking), even though it might not be considered correct English (*e.g.*, ranch, ranched, ranching).

out, and presented the next trial with the same stimulus item.

Discrimination training among trained stimulus items. The first type of discrimination training was started after each two stimulus items were trained separately for one answer form. Here, the experimenter presented the statement-question for both stimulus items in random order and reinforced correct answers. Incorrect responses produced "No", a model of the correct answer, and timeout. Discrimination training between two items was terminated when four consecutive correct answers were emitted.

A second type of discrimination training consisted of asking one form of statement-question for all stimulus items trained. For example, if one answer form had been trained across eight stimulus items, the statement-question was asked with these eight items presented in an unsystematic order until a child produced 12 consecutive answers. Correct answers were reinforced on a variable-ratio two (VR 2) schedule in which, on the average, every second correct answer was reinforced. Incorrect answers produced "No", a model of the correct answer, and timeout.

Discrimination training among question forms. Discrimination training between question forms was accomplished by presenting the two or three different question forms with the first stimulus item, then the second item, and then both items alternately. Training continued with the third and fourth items presented singly and then alternately. The question forms were next asked with all four items and then with the first 12 training stimulus items listed in Table 2.

Throughout this discrimination training, the different question forms and stimulus items were presented in unsystematic order. The criterion for advancing from each step of training was 12 consecutive responses.

At first, each correct answer was reinforced. After two consecutive sessions with at least 40% correct answers, the reinforcement schedule was changed to VR 2 for consecutive correct answers. (In a conventional VR 2 schedule, reinforcement would follow, on the average, every second correct answer regardless of how many incorrect responses were interspersed among the correct answers. However, under the VR 2 schedule used here, reinforcement was delivered only if the answer to be followed by reinforcement was correct, and if it had been immediately preceded by a correct answer.) Each incorrect response was followed by "No",

a model of the correct answer, and timeout. Following timeout, the experimenter asked the same statement-question just missed.

Test Procedures

Before any specific training on answers, each child was pretested three times, each consisting of asking all three question forms with a random sample of 48 of the stimulus items shown in Table 2.

A test followed the training of each six stimulus items (except for discrimination training among question forms where a test followed each 12 stimulus items trained). Tests evaluated two characteristics of training: first, whether children correctly answered questions involving stimulus items specifically trained, and second, whether children correctly answered questions involving stimulus items not specifically trained (generative items or generative questions).

Each test was composed of 48 questions. Eighteen generative questions (six each of the three different forms) were intermixed with 30 training questions. These 30 training questions were composed of previously trained stimulus items. For example, if training had just been completed on six stimulus items for one question form, these six items were each used five times to produce the 30 training questions. If discrimination training between two forms had just been completed across 24 training stimulus items, these 24 items were randomly drawn to be used as the 30 training questions on subsequent tests.

Of the 30 training questions on each test, 24 were reinforced (praise, food, marks) if answered correctly. Answers to the other six training questions and the 18 generative questions were not reinforced. No consequences followed incorrect responses.

Experimental Design

A multiple-baseline design across different question forms for each child was used. After the three pretests, one form of answer was trained. Then all three answer forms were again tested. After a criterion of generative answering was met for one form under testing, training was begun on a second form, followed by testing across all three forms. After the criterion was met for a second form, discrimination training between two question forms was done, followed by testing on all three forms. After the third answer form was trained, all three forms were again tested. Discrimination training was done among the three question forms and followed by testing.

Training on the same form(s) was resumed after each test, unless four or more generative questions of the form(s) just trained were answered correctly. If such a criterion was met, a second test followed. If this criterion was met on the second test, training was begun on a different question form(s).

Recording Responses

During training and testing, the experimenter recorded the number of correct and incorrect responses; during testing, the experimenter wrote verbatim a child's response. On about 25% of tests, an observer independently recorded the child's responses. Reliability of the experimenter's measurement of a child's verbal responses was checked through two comparisons between the experimenter's and the observer's record. First, records were compared for word-by-word agreement. Here, agreement was scored for each word recorded by both experimenter and observer. A disagreement was scored wherever one record contained a word that did not appear on the other. (The words also had to be in the same order; if two words were switched, one disagreement was scored.) Second, the experimenter's and observer's records were compared wherever one or both indicated that the child had emitted an answer of one of the three forms. An agreement was scored for each question where both records showed the same answer form; otherwise, a disagreement was scored.

The percentage agreement (agreements divided by agreements plus disagreements) for

both comparisons was calculated only for answers to generative test questions, since reinforcement never followed these answers, and thus no cues were given to the observer concerning the correctness of the subject's response. The word-by-word reliability for each subject was: Kent, 92%; Sherry, 99%; Greg, 91%; Martin, 92%; Sean, 96%; Alex, 83%; Marjorie, 88%. The answer-form reliability for each child was: Kent, 100%; Sherry, 97%; Greg, 89%; Martin, 92%; Sean, 89%; Alex, 100%; Marjorie, 100%.

RESULTS

Figures 1 through 4 present the number of correct answers by each child to the 18 generative questions (six of each form) asked during each test. The three graphs for each child correspond to the three question forms. The open circles indicate the answer form(s) trained before the test.

Figure 1 shows the results of the 13 tests given to Kent. During the pretests (Tests 1 to 3), no questions were answered correctly. Before both Test 4 and Test 5, Kent was taught to answer Form A questions over six training items. On Test 4, Kent answered three Form A generative questions correctly, and on Test 5 he answered five correctly. He did not answer any Form B or Form C questions correctly on these tests. Although the criterion for changing training conditions (two consecutive tests with four or more correct generative answers of the form[s] currently being trained) had not been met, training was begun on Form B by mistake. Preceding each of Tests 6, 7, and 8, six additional items on Form B were trained. The tests resulted in correct answers to two Form B questions on Tests 6 and 7 and to five Form B questions on Test 8. No correct answers to either

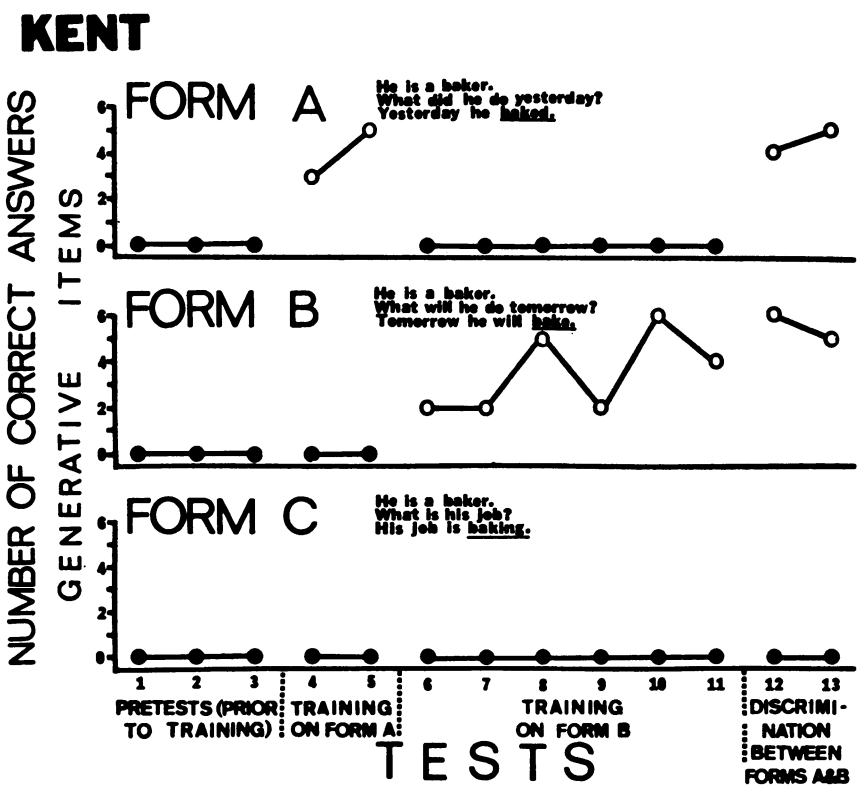

Fig. 1. Test results for Kent (retarded child). Each graph shows the number of correct generative answers to one of three forms of questions presented on tests.

Form A or Form C generative questions were emitted. Since more than four Form B generative questions were answered correctly in Test 8, no additional items were trained before Test 9. Two Form B questions were correctly answered during Test 9; thus, before Test 10 another six items were trained. Since all six Form B questions were answered correctly on Test 10, no additional items were trained before Test 11. On Test 11, four Form B questions were answered correctly; consequently, training on Form B questions was terminated because criterion had been met. Before both Test 12 and Test 13, discrimination training between two question forms (Forms A and B) was done across 12 training items. The results of these tests show that training re-established correct answers to Form A questions and maintained correct answers to Form B questions. Kent was not trained on Form C questions, nor did he answer any of them correctly.

Test results for a child trained across three forms of questions are shown in Figure 2 (Sherry). No correct answers were emitted during the pretests (Tests 1 to 3). Initially, the Form C answer was trained. As is evident from the open circles (Tests 4 to 10), generative answers to Form C test questions were gradually established. However, no Form B or Form A questions were answered correctly during these tests. Form B generative answers were established at 100% after training on only six items (Tests 11 and 12). As was the case with Kent, establishing correct answers to the second form of question eliminated correct answers to the previously trained form. Correct answers to both of these forms resulted on Tests 13 and 14, which followed discrimination training between two question forms. Correct generative answering to Form A questions was established only after some training on this answer form (Tests 15 to 17). During these tests, some correct answering was maintained on Form C questions (6%) and, to a greater extent, on Form B questions (72%). However, a larger percentage of answering was established to all three question forms on tests administered after discrimination training among all three forms (Tests 18 to 22).

The four other children showed results almost identical to those obtained with Kent and Sherry. Two of these children, Greg and Martin, were trained on two question forms. The other two, Sean and Alex, were trained on all three question forms. Their test results (Figure 3) reveal that correct generative answering to a question form was established only after the child was trained on some training items of that form. Again, correct generative answering to the previously trained question form(s) decreased when a new question form was trained.

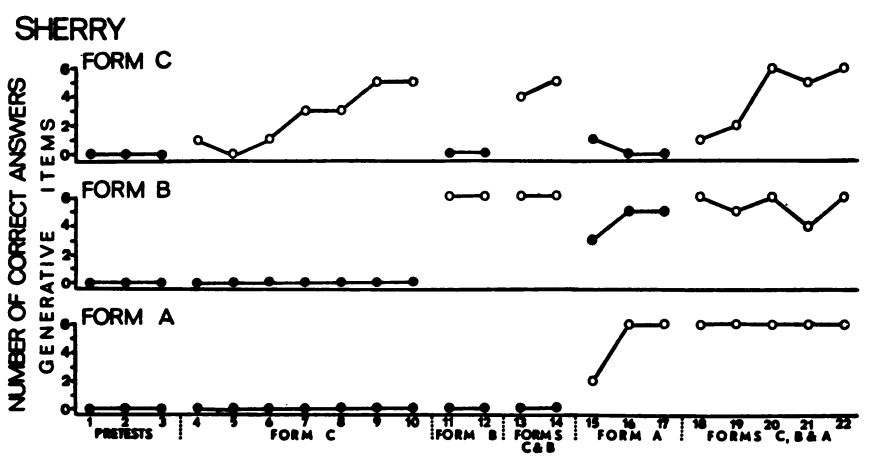

Fig. 2. Test results for Sherry (retarded child). Each graph shows the number of correct generative answers to one of three forms of questions presented on tests.

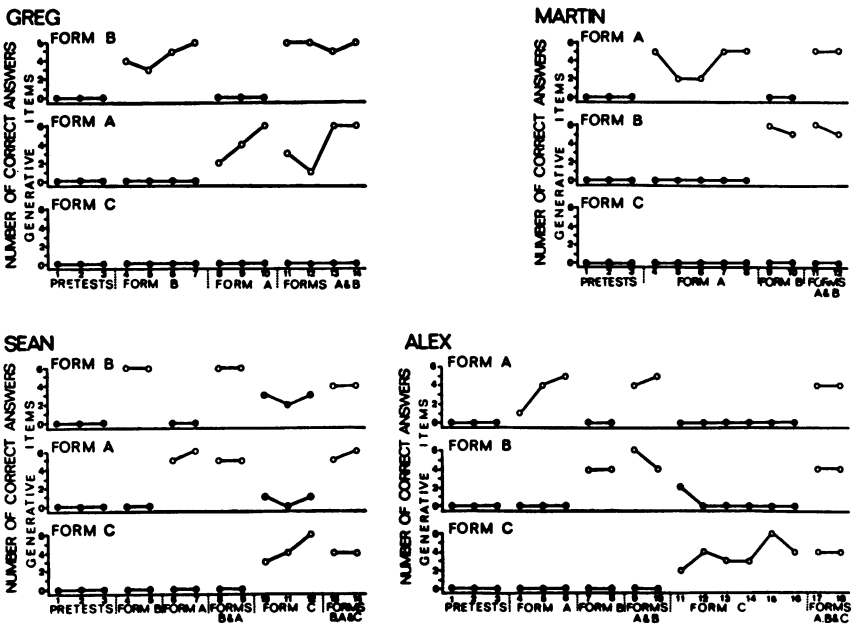

Fig. 3. Test results for Greg, Martin, Sean (economically disadvantaged children), and Alex (retarded child). Each graph shows the number of correct generative answers to one of three forms of questions presented on tests.

Correct generative answering increased after discrimination training was undertaken among the question forms.

The test results for a seventh child, Marjorie, are shown in Figure 4, and reveal the same pattern as the previous subjects, at least through discrimination training between two question forms. However, during Tests 14 through 23, Marjorie correctly answered almost all (92%) of the Form C training questions (not shown in Figure 4) but a very low percentage of the generative questions. Thus, it appeared that Marjorie discriminated between those stimulus items for which reinforcement was occasionally scheduled (*i.e.*, training items) and those stimulus items for which no reinforcement had ever been provided (*i.e.*, generative items). In an attempt to make such a discrimination more difficult, the generative stimulus items used on all previous tests were replaced with new stimulus items for Tests 24 through 29. Marjorie had not been exposed to these stimulus items except for imitative pronunciation of them. As is evident from Tests 24 and 25, Marjorie cor-

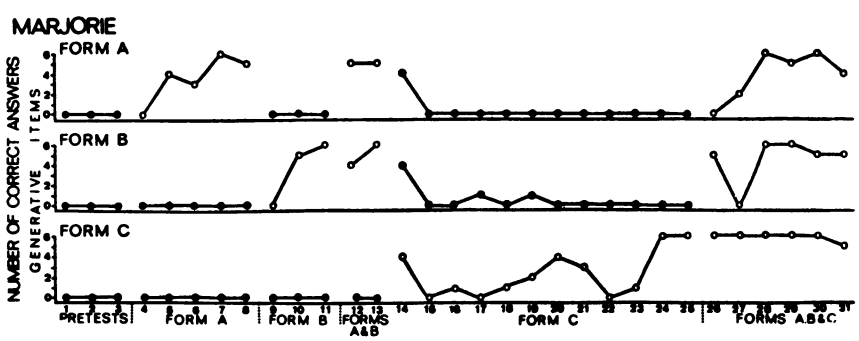

Fig. 4. Test results for Marjorie (economically disadvantaged). Each graph shows the number of correct generative answers to one of three forms of questions presented on tests.

rectly answered 100% of the Form C generative questions. Using these same new generative stimulus items, correct answering was established through discrimination training among all three question forms (Tests 26 to 29). To evaluate whether correct generative answering would be maintained with the original set of generative stimulus items, Tests 30 and 31 were administered with the original generative items, and correct answering was maintained for all three question forms.

During each test, 30 training questions were also asked. After three pretests, during which no questions were answered correctly, the children answered the training questions correctly with the following average accuracy: Kent, 75%; Sherry, 91%; Greg, 90%; Martin, 83%; Sean, 87%; Alex, 85%; Marjorie, 94%.

An additional feature of these test results was the "over-generalization" exhibited by all seven children (*i.e.,* the percentage of previously trained question forms answered with the form presently being trained). After the children were trained on their second answer form, this form was used in answering the following per cent of generative test questions of the first form: Kent, 8%; Sherry, 75%; Greg, 89%; Martin, 67%; Sean, 92%; Alex, 100%; Marjorie, 28%. The four children trained on a third answer form emitted this form when asked generative test questions of forms previously taught in the following percentages: Sherry, 0%; Sean, 17%; Alex, 88%; Marjorie, 2%. In each case, the over-generalizations were eliminated when discrimination training among the forms of questions was undertaken.

DISCUSSION

This experiment showed that a relatively complex generative language repertoire, involving verb transformations in complete sentences, can be established in language-deficient children through modelling and reinforcement. The results extend those of previous research (Garcia *et al.,* 1973; Guess, 1969; Guess *et al.,* 1968; Hart and Risley, 1968; Lahey, 1971; Lutzker and Sherman, 1974; Sailor, 1971; Schumaker and Sherman, 1970; Wheeler and Sulzer, 1970) by (a) requiring relatively long verbal response chains with verb transformations, and (b) establishing the concurrent use of three different complete sentences, each under separate stimulus control of different verbal stimuli (questions).

Ervin (1964) reported that, with normal children, newly acquired language patterns may temporarily "over-generalize" to previously established language patterns. Guess *et al.* (1968) and Schumaker and Sherman (1970) also found over-generalization across the generative repertoires they established in experimental settings, and correlated this with a decrease in correct responses of other forms previously trained. In the present experiment, the children showed a decrease in correct answering to the generative test questions when they were trained on the second and/or third answer form. For example, on tests administered after training on the second answer form, five of the seven children used a large percentage (67% or greater) of these answers in response to the first form of question trained. However, as was found in previous studies (*e.g.,* Baer and Guess, 1971; Schumaker and Sherman, 1970), discrimination training among question forms resulted in correct answering to the trained question forms and elimination of all over-generalization.

The prevalence and importance of generative language in children has been discussed in several normative-observational studies (Brown and Bellugi, 1964; Ervin, 1964; McNeill, 1966). Since experimental studies employing modelling and reinforcement can produce generative repertoires with features similar to those observed in normal children, these studies provide an important basis for development of programs to remedy children's language deficits.

REFERENCES

Baer, D. M. and Guess, D. Receptive training of adjectival inflections in mental retardates. *Journal of Applied Behavior Analysis,* 1971, **4,** 129-139.

Brown, R. and Bellugi, U. Three processes in the child's acquisition of syntax. In E. Lenneberg (Ed.), *New directions in the study of language.* Cambridge, Massachusetts: M.I.T. Press, 1964. Pp 131-161.

Ervin, S. M. Imitation and structural change in children's language. In E. Lenneberg (Ed.), *New directions in the study of language.* Cambridge, Massachusetts: M.I.T. Press, 1964. Pp 163-189.

Garcia, E., Guess, D., and Byrnes, J. Development of syntax in a retarded girl using procedures of imitation, reinforcement, and modelling. *Journal of Applied Behavior Analysis,* 1973, **6,** 299-310.

Guess, D. A functional analysis of receptive language and productive speech: acquisition of the plural morpheme. *Journal of Applied Behavior Analysis,* 1969, **2,** 55-64.

Guess, D. and Baer, D. M. An analysis of individual differences in generalization between receptive and productive language in retarded children. *Journal of Applied Behavior Analysis,* 1973, **6,** 311-329.

Guess, D., Sailor, W., Rutherford, G., and Baer, D. M. An experimental analysis of linguistic development: the productive use of the plural morpheme. *Journal of Applied Behavior Analysis,* 1968, **1,** 297-306.

Hart, B. M. and Risley, T. R. Establishing use of descriptive adjectives in the spontaneous speech of disadvantaged preschool children. *Journal of Applied Behavior Analysis,* 1968, **1,** 109-120.

Lahey, B. B. Modification of the frequency of descriptive adjectives in the speech of Head Start children through modelling without reinforcement. *Journal of Applied Behavior Analysis,* 1971, **4,** 19-22.

Lutzker, J. R. and Sherman, J. A. Producing generative sentence usage by imitation and reinforcement procedures. *Journal of Applied Behavior Analysis,* 1974, **7,** 447-460.

McNeill, D. Developmental psycholinguistics. In F. Smith and G. A. Miller (Eds.), *The genesis of language: a psycholinguistic approach.* Cambridge, Massachusetts: M.I.T. Press, 1966. Pp 15-84.

McReynolds, L. V. Application of timeout from positive reinforcement for increasing the efficiency of speech training. *Journal of Applied Behavior Analysis,* 1969, **2,** 199-205.

Risley, T. R. and Wolf, M. M. Establishing functional speech in echolalic children. *Behaviour Research and Therapy,* 1967, **5,** 73-88.

Sailor, W. Reinforcement and generalization of productive plural allomorphs in two retarded children. *Journal of Applied Behavior Analysis,* 1971, **4,** 305-310.

Schumaker, J. and Sherman, J. A. Training generative verb usage by imitation and reinforcement procedures. *Journal of Applied Behavior Analysis,* 1970, **3,** 273-287.

Wheeler, A. J. and Sulzer, B. Operant training and generalization of a verbal response form in a speech-deficient child. *Journal of Applied Behavior Analysis,* 1970, **3,** 139-147.

Zimmerman, B. J. and Rosenthal, T. L. Observational learning of rule-governed behavior by children. *Psychological Bulletin,* 1974, **81,** 29-42.

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