*THE MODIFICATION AND GENERALIZATION OF VOICE
LOUDNESS IN A FIFTEEN-YEAR-OLD RETARDED GIRL¹*

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A fifteen-year-old severely disturbed girl was treated for aphonia. Because of the extent of her withdrawal, the subject was conditioned in a laboratory setting and received tokens for speaking loudly enough to operate a voice-operated relay. Conditioning at first consisted of saying 100 monosyllabic words, with the possibility of reinforcement on each word. Later, the subject was required to say a polysyllabic word, and finally, five or six words per token. The subject was shaped to speak with normal loudness in the laboratory, and generalization to a reading situation in the laboratory was measured and observed to occur, at first for a few minutes, and later for a longer period. Generalization to a reading situation in the classroom did not occur, but the subject's voice loudness also increased in the classroom when several new reinforcement contingencies were put into effect there.

Vocal behavior, like other operants, has two important features—rate and topography. The rate of speech has been brought under the control of consequences in several studies (Salzinger, Salzinger, Portnoy, Eckman, Bacon, Deutsch, and Zubin, 1962; Shearn, Sprague, and Rosenzweig, 1961; Yoder, *unpublished*). The topography of speech can differ in many aspects. Reinforcement and punishment con-

tingencies have been shown to be effective, for example, in controlling disfluencies (Flanagan, Goldiamond, and Azrin, 1958; Goldiamond, 1965; Halvorson, 1971; Kerr, Meyerson, and Michael, 1965; Pineda, Barlow, and Turner, 1971), inappropriate or unintelligible vocalizations (McReynolds, 1969), pitch (Cross and Lane, 1962), duration (Lane, 1964; Picaizen, Berges, Baronofsky, Nichols, and Karen, 1969), and loudness (Bangs and Freidinger, 1949; Bijou and Baer, 1966; Black, 1951; Norman and Broman, 1970; Walton and Black, 1959).

The present study addressed itself to the latter feature—loudness. As in the Bangs and Freidinger (1949) study, voice loudness was increased by presenting reinforcement contingent upon progressively louder vocalizations. Because the terminal objective was to increase loudness in the classroom, and because of the failure of previous studies to show the generalization of treatment effects (*e.g.*, Kale, Kaye, Whelan, and Hopkins, 1968; Lapuc, 1970; Lyon, 1971; Wahler, 1969; and Walker and Buckley, 1972), the procedure involved the observation of generalization effects in two environments and the subsequent training of the response in the natural environment.

¹This study was conducted while the authors worked in the School Adjustment Program, Kalamazoo Valley Intermediate School District, Kalamazoo, Michigan, and is based in part on a master's thesis submitted by the senior author to the Department of Psychology, Western Michigan University. The valuable assistance of Dr. Robert P. Hawkins, who was the Director of the School Adjustment Program, and the financial support of the Kalamazoo Valley Intermediate School District are gratefully acknowledged. The generous help of Dr. Howard N. Sloane, Jr. in the preparation of this manuscript is also acknowledged.

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METHOD

Subject

The study was carried out with a 15-yr-old girl (Alice) who emitted little social behavior. Alice had been in classes for the mentally retarded since the age of seven, when she was diagnosed as "severely disturbed, withdrawn, and mildly retarded" (full scale WISC IQ of 75) by the school diagnostician. Her previous teacher in a classroom for the mentally retarded had related that Alice had participated in group activities only rarely and almost never spoke at an audible level.

Alice had never been observed to engage in any spontaneous social interaction during the three months she had been enrolled in a public school program for the emotionally disturbed ("The School Adjustment Program" described by Hawkins, McArthur, Rinaldi, Gray, and Schaftnaar, *unpublished*). She typically spent the day sitting at her desk with her head bowed and her hair almost completely obscuring her face.

Alice's answers to questions posed by workers in the school program usually consisted of a slight shrug of the shoulders or nod of the head. Any verbal response was almost inaudible. Attempts by the workers (a master's level special-education teacher and a master's level psychologist, both trained in behavior modification) to modify Alice's verbal behavior by prompting, modelling, or differentially reinforcing louder speech had not been successful, although she had made a great deal of progress in written work.

In order to discriminate more reliably increases in voice intensity, and to allow more intensive individual treatment, an instrumented laboratory procedure was devised.

Apparatus

Experimental sessions took place in a 4 by 4 ft (1.2 by 1.2 m) plywood cubicle lined with acoustical tile. The experimenter was seated in a similar cubicle 15 ft (4.5 m) away. The sub-

ject's cubicle contained a table and chair, a 7.5-W cue light, an automatic token delivery mechanism, and two microphones fastened to a stiff wire lavalier. One microphone was attached to a tape recorder, and the other to the voice-operated relay and decibel meter described below. The subject was provided with a stack of 100 two-by-five in. (5 by 10 cm) cards on which were written single monosyllabic words taken from first-grade reading books. A first-grade reader (Robinson, Monroe, Artley, and Huck, 1965) was used in place of the cards later in the experiment.

The experimenter's cubicle contained a voice-operated relay, or VOX (Hunter Manufacturing Company). By decreasing the sensitivity of the VOX, the experimenter could require a greater voice intensity to activate the relay and hence to meet the criterion for token delivery. Also in the experimenter's cubicle were a volt meter with a decibel scale (Heath Company vacuum tube volt meter, Model V-7A) for determining response intensity, and a tape recorder for recording vocalizations. The decibel meter was calibrated by means of a sound level meter (General Radio Company, Model 759).

An air circulation fan, located approximately 8 ft (2.4 m) behind Alice, was used to mask noises from outside the room. The decibel meter was calibrated so that this ambient noise level of 58 dB read as zero on the decibel meter scale. Conventional electromechanical programming apparatus, which served to switch on lights and to operate the token dispenser, was located in a sound-attenuating closet behind the experimenter.

A hexagon table, approximately 36 in. (90 cm) wide, was used for group sessions, which were held in the regular classroom. An arrangement of artificial flowers in the center of the table concealed a microphone, which was connected to a tape recorder that recorded voice levels for subsequent data analysis. Disruptive noises from other parts of the room were minor, but on occasion they necessitated the exclusion from analysis of a word or two on the tape.

Procedure

Data were collected in three settings labelled "shaping", "daily lab generalization check", and "daily classroom generalization check".

Shaping. During the "shaping" sessions, the subject was seated in the cubicle with the microphone lavalier around her neck and the word-cards in a pile on the table in front of her. The onset of the cue light signalled the beginning of a 5-sec interval during which the subject read aloud the word on the top card, removed the card from the pile, and then waited for the cue light to go off (for 2 sec) and come back on. One hundred words were read in each of these sessions, which were conducted once or twice per day.

Daily lab generalization check. Immediately after each "shaping" session, the experimenter would join the subject in her cubicle to listen to her read from a book for 10 min. These sessions were tape recorded for subsequent analysis. At no time during the "lab generalization check" were any consequences arranged for voice intensity.

Daily classroom generalization check. Data were collected in the classroom while Alice, the teacher, and four classmates sat at a six-sided table and worked on daily English assignments. The responses made in these sessions included reading stories aloud and answering questions. No prompting or reinforcement of loud speaking was scheduled here until "generalization training" late in the experiment. The teacher would respond to Alice only as necessary to indicate what or when to read, or to reinforce correct answers to questions. The sessions occurred at the teacher's convenience, but once each day. They were never scheduled less than 30 min before or after a "shaping" session.

In addition, the study was divided into four main phases based on the manipulations in the "shaping" setting.

Baseline. During baseline, no consequences were scheduled for loudness. The subject merely read the cards as instructed and the experi-

menter recorded the intensity of each response, measured as the extent of needle deflection on the decibel meter.

Tokens for louder speech. At the beginning of this phase, the VOX was set for maximum sensitivity. A response of great enough intensity to operate the relay (a "hit") would deliver a token (poker chip) to the subject by means of the automatic token-delivery mechanism. A response of insufficient intensity to operate the relay (a "miss") produced no consequence. Whenever approximately 80% of the responses that Alice made in a session were hits, the sensitivity of the VOX was decreased slightly (by one "unit" as measured on the dial face of the VOX), to require Alice to make responses of greater intensity in order to obtain tokens. These adjustments were always made midway through a session.

At the beginning of this phase, Alice was shown the tokens and told that she could use them to buy items she desired (she worked for books, beauty aids, and a photo album, among other things). She was informed that she must talk "loudly" to earn the tokens. Before each of the subsequent sessions, she was told either "Talk loudly and earn a lot of tokens", or "Do a good job and earn a lot of tokens". After each session, the tokens were counted and the number was recorded on a ledger sheet. Alice could earn enough tokens in one session to buy a small item (e.g., a hair brush), or she could save them up until she had enough to buy a larger item (e.g., a book or photo album).

Tokens for softer speech. To demonstrate that the contingent delivery of tokens was the variable that controlled the subject's speech intensity, tokens were delivered for misses and no tokens were delivered for hits during this phase of the experiment. Using a procedure similar to one used by Lane (1964) in his study of the differential reinforcement of vocal duration, Alice was gradually required to speak softer and softer in order to earn tokens, even though instructions given by the experimenter continued to indicate otherwise.

Tokens for louder speech. At the beginning of this phase, Alice once again earned tokens when she met a loudness criterion.

Tokens plus generalization training. After 20 sessions of the second "tokens for louder speech" phase, and due to time limitations, it was decided that rather than investigate individually the variables that might produce generalization, it would be more appropriate to engage in an all-out attempt to produce satisfactory talking in the classroom. In an effort to promote generalization by increasing common elements between the experimental and the classroom settings, the following procedures were added or changed in the "shaping" setting in the order presented here:

1. The requirement for reinforcement was increased by having Alice read words from a book, 75% of which were polysyllabic (rather than reading the monosyllabic words on the cards). The words varied from one to five syllables each. Each time the cue light came on, Alice would read one word.
2. Two of Alice's classmates studied silently several feet away from the experimental booth during the "shaping" sessions. (This procedure remained in effect until the end of the experiment).
3. The response requirements were extended to require Alice to say two words (75% of which were polysyllabic) per reinforcement.
4. The side of Alice's booth was swung out at a 45° angle, which greatly reduced her privacy.
5. The response requirements were further extended to require one line of reading per reinforcement.
6. The side of Alice's cubicle was removed (and not replaced during the remainder of the experiment), exposing her to the studying classmates.
7. Five students and a teacher conducted a study period in the room during Alice's "shaping" sessions.

In addition, the following procedures were used:

1. The "classroom generalization checks" were conducted in the lab room, where the experimenter replaced the classroom teacher as the leader of the sessions.
2. The teachers and aides in the classroom prompted and reinforced appropriate talking and social behavior throughout the day.
3. Finally, the classroom teacher was reinstituted as the leader of the "classroom generalization check" sessions.

In the case of each of these generalization training procedures, the criterion for starting the next procedure was that Alice's voice loudness be no lower than it had been during the previous procedure. That is, Alice had to speak at least as loudly as she had during the previous procedure before the next procedure was instituted.

Periodically, some of Alice's classmates were asked to go through a "shaping" session and a "lab generalization check" under the exact conditions that prevailed for Alice during the baseline phase. No reinforcements were dispensed, and the instructions were the same as they had been for Alice during the baseline phase. Five students were tested in the "shaping" setting, each an average of five times. Also, four of these same students were tested an average of four times each in the "lab generalization check" setting. Finally, the voice intensity of the four students was measured five times each in the "classroom generalization check" setting. The resulting data provided a norm of voice loudness in each setting, against which Alice's performance could be compared.

RESULTS AND DISCUSSION

Shaping

The loudness data for the "shaping" sessions, in mean decibels per word, are presented in

Figure 1. Alice's decibel level is indicated relative to a zero point, which is the mean decibel level produced by Alice's classmates in the "shaping" setting. The range of the voice loudness of Alice's classmates in this setting is shown by the dashed lines.

During baseline, the level of Alice's voice was not measurably greater than the ambient noise level in the room. A barely audible mumble was the only indication to the experimenter that Alice had indeed responded.

During the first "tokens for louder speech" phase, Alice made gradual but consistent improvement. The raw data indicated that increases in the criterion for reinforcement were followed fairly immediately by an increase in voice intensity. Since the data are presented in blocks of three sessions per data point, however, this effect cannot be shown in Figure 1. In all,

the sensitivity of the VOX was decreased 11 times during this phase. (Other than Alice's daily variability in responding, which was not severe, this is the only bit of information lost by grouping the data in blocks of three sessions.)

The reversal procedure used in the "tokens for softer speech" phase produced a sudden drop in voice loudness, which supported the hypothesis that the token contingency had been a significant variable in increasing the subject's voice loudness. When tokens again were made contingent upon loud reading, Alice's voice loudness again increased gradually. During this second "tokens for louder speech" phase, the intensity of Alice's voice as measured in the "shaping" sessions was higher than that of any of her classmates, none of whom had any obvious speech deficiencies.

During "tokens plus generalization training",

Fig. 1. Results of the "shaping" sessions, in blocks of three sessions per data point. The data are shown in relation to the average loudness of the subject's peers in this setting (zero point on the ordinate). The range for these subjects is shown by the dashed line. After baseline, tokens were given for meeting a loudness or softness criterion. Additional procedures were used in the final experimental phase to ensure behavior change in the classroom.

Alice continued to speak louder than any of her classmates had in the "shaping" setting, although, as expected, there were periodic decreases in loudness when a new generalization training procedure was begun.

The change in the loudness of Alice's speech was quite dramatic by subjective impression also. Near the end of the experiment, Alice was speaking so loudly in the "shaping" sessions that the experimenter would have considered her to be abnormally loud if she were to use the same voice intensity in the classroom.

Lab Generalization Checks

Figure 2 presents the data from the "lab generalization checks". Of the approximately 1100 words spoken by Alice in each of these sessions, 50-word samples were analyzed from the beginning, the middle, and the end of each session. The sample from the beginning was taken

from the first minute of the sessions, the sample from the middle was taken starting at the beginning of the sixth minute of the sessions, and the sample from the end was taken from the tenth minute of the sessions. These three samples are averaged together for each session in Figure 2. The mean and range of voice loudness for Alice's peers in this setting is again presented as in Figure 1.

Although increases in voice loudness were never differentially reinforced in this setting, loudness gradually improved such that by the end of the experiment, the intensity of Alice's voice was well within the range of intensities of her classmates.

Interobserver reliability measures were taken on the data from the "lab generalization checks" to determine how accurately the experimenter was reading the decibel meter. A second observer analyzed some of the same word samples

Fig. 2. Results of the "lab generalization checks", in blocks of three sessions per data point. The data are shown in relation to the average loudness of the subject's peers in this setting (zero point on the ordinate). The range for these subjects is shown by the dashed lines. No reinforcement contingencies were used in these checks.

from the recorded sessions as had been taken by the experimenter, measuring the loudness of each word in the sample with the decibel meter. The mean loudness per word in decibels was calculated for each sample and then compared with the scores obtained by the experimenter. The per cent of agreement of the two mean values obtained for each sample was determined by dividing the smaller score by the larger. The average per cent of agreement scores are as follows: Session 3, 78%; Session 6, 86%; Session 11, 82%; Session 29, 77%; Session 48, 80%; and Session 72, 81%. The experimenter's mean scores for these sessions averaged -5.5 dB and ranged from -6.8 to -3.6 dB. The second observer's mean scores averaged -5.1 dB and ranged from -7.2 to -2.4 dB. There appeared to be no consistent experimenter bias in these data because the second observer's scores were not consistently lower or higher than the experimenter's scores. In three of the reliability checks, the experimenter obtained higher scores; in the other three, the second observer obtained higher scores.

Early in the first "tokens for louder speech" phase, it was discovered that Alice was reading more loudly at the beginning of the "lab generalization checks" than later in those sessions. That is, immediately after the "shaping" session, as the "lab generalization check" began, Alice spoke louder than she did a few minutes later. A comparison of the raw data indicated that this temporary effect was to be found in nearly every session. This effect is presented in detail in Figure 3. Each of the four lines in this figure indicates combined data taken over a series of successive sessions to show the general progress of Alice's voice loudness as a "lab generalization check" progressed at four different points in the experimental procedure (see Figure 3 for the particular sessions represented). For each of these four samples, then, the mean loudness of the first five words of all the grouped sessions combined is presented as the first data point, the mean loudness of the second five words is presented as the second data point, and so on. Sim-

ilarly, the data for the middle 50 and the last 50 words are presented. Again, the mean voice loudness of Alice's peers appears as the solid line, and their range appears as the two dashed lines.

This phenomenon can be seen in the data from early in the first "tokens for louder speech" phase (Sessions 15 to 24) in Figure 3. Alice spoke slightly louder in saying the first few words in the "lab generalization check" and then diminished this intensity to about her previous low point.

To lend support to the hypothesis that this effect was due to short-term or "temporal" generalization from the immediately preceding "shaping" session, and not simply because of fatigue within each session, the loudness of successive blocks of five words was measured for a sample of seven baseline sessions (Sessions 6 to 12 in Figure 3). Since there was little change in these baseline data, the decline in loudness as Sessions 15 to 24 progressed might be interpreted as a carryover generalization effect resulting from the "shaping" session held immediately before. Although the phenomenon as it occurred in these particular sessions appeared to be simply a "de-activation" of Alice's loud speaking in the immediately preceding "shaping" session, there was evidence of an increasing amount of generalization in later sessions. The grouped data shown in Figure 3 for Sessions 56 to 63 indicate that generally, Alice was speaking considerably louder throughout the "lab generalization checks" at this point in the experiment. The data for Sessions 84 to 93 indicate that now Alice was speaking even more loudly and that the voice intensity used at the beginning of the sessions was maintained until the session was over. The latter data are from the "tokens plus generalization training" phase, and show that Alice was speaking well within the determined range for her classmates in this setting.

Classroom Generalization Checks

The data from the "classroom generalization checks" are shown in Figure 4. As was the case

Fig. 3. Relative loudness of Alice's voice as "lab generalization checks" progressed at four different points in the experimental procedure. Each data line represents combined data taken over a series of successive sessions. The average loudness of successive blocks of five words was determined from the data for these combined sessions, and is represented here for the first 50 words spoken, the 50 words at the half-way point of the sessions, and for 50 words at the end of the sessions.

with Figures 1, 2, and 3, the average voice intensity of Alice's classmates is indicated by the solid line at the zero point on the ordinate, and the range is indicated by the two dashed lines.

There appeared to be little or no generalization from the "shaping" sessions to the "classroom" sessions during the first three experimental phases. The procedures used in "tokens plus generalization training", however, produced a fairly immediate increase in voice loudness. It can be seen that at the end of the study Alice was speaking with an intensity within the range shown by the classmates in this setting. This improvement occurred, however, only after the rather intense generalization training.

The occasional failure of behavior changes to generalize from a therapeutic or training situation to other environments has been recognized by many practitioners (*e.g.*, Kale *et al.*, 1968; Wahler, 1969; Walker and Buckley, 1972). In these studies, as well as in the present research, the failure of generalization was perhaps due to the dissimilarity of the stimulus conditions in the training and testing environments. Stimulus control of soft speech was occurring in the classroom until the final phase of the present study, just as loud speech was under discriminative control in the lab.

It is significant that the generalization procedures employed in the "tokens plus general-

tions, were quite dramatic. Several checks made by the experimenter and school officials during the next school year found Alice back in a normal classroom, engaging in a wide variety of activities, both in her classroom and outside of school, including holding a job as a waitress.

The double approach used in this study appears to be an effective procedure, especially when concerned with a problem as severe as Alice's. In general, in cases where direct intervention in the natural environment is inadequate, a procedure that ensures the intensive, precise, well-controlled conditioning of the behavior outside the natural environment and then the generalization and subsequent maintenance of this behavior within the natural environment appears to be more effective than other procedures.

REFERENCES

- Bangs, J. L. and Freidinger, A. Diagnosis and treatment of a case of hysterical aphonia in a thirteen-year-old girl. *Journal of Speech and Hearing Disorders*, 1949, 14, 312-317.
- Bijou, S. W. and Baer, D. M. Operant methods in child behavior and development. In W. Honig (Ed.), *Operant behavior: areas of research and application*. New York: Appleton-Century-Crofts, 1966. Pp. 718-789.
- Black, J. W. The effects of delayed sidetone upon vocal rate and intensity. *Journal of Speech and Hearing Disorders*, 1951, 16, 56-60.
- Cross, D. V. and Lane, H. L. On the discriminative control of concurrent responses: the relations among response frequency, latency, and topography in auditory generalization. *Journal of the Experimental Analysis of Behavior*, 1962, 5, 487-496.
- Flanagan, B., Goldiamond, I., and Azrin, N. Operant stuttering: the control of stuttering behavior through response contingent consequences. *Journal of the Experimental Analysis of Behavior*, 1958, 1, 173-177.
- Goldiamond, I. Stuttering and fluency as manipulatable operant response classes. In L. Krasner and L. P. Ullmann (Eds.), *Research in behavior modification*. New York: Holt, Rinehart, and Winston, 1965. Pp. 106-156.
- Halvorson, J. A. The effects on stuttering frequency of pairing punishment (response cost) with reinforcement. *Journal of Speech and Hearing Research*, 1971, 14, 356-364.
- Hawkins, R. P., McArthur, M., Rinaldi, P. C., Gray, D. B., and Schaftenaar, L. *Results of operant conditioning techniques in modifying the behavior of emotionally disturbed children*. Unpublished paper presented at the 45th Annual International Council for Exceptional Children Convention, St. Louis, 1967.
- Kale, R. J., Kaye, J. H., Whelan, P. A., and Hopkins, B. L. The effects of reinforcement on the modification, maintenance, and generalization of social responses of mental patients. *Journal of Applied Behavior Analysis*, 1968, 1, 307-314.
- Kerr, N., Meyerson, L., and Michael, J. A procedure for shaping vocalizations in a mute child. In L. P. Ullmann and L. Krasner (Eds.), *Case studies in behavior modification*. New York: Holt, Rinehart, and Winston, 1965. Pp. 366-370.
- Lane, H. L. Differential reinforcement of vocal duration. *Journal of the Experimental Analysis of Behavior*, 1964, 7, 101-115.
- Lapuc, P. S. Behavior modification and stimulus generalization. *Dissertation Abstracts International*, 1970, 31, 396.
- Lyon, V. L. Conditioning and generalization of verbal responses in hospitalized schizophrenics. *Dissertation Abstracts International*, 1971, 32, 2403.
- 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.
- Norman, A. and Broman, H. J. Volume feedback and generalization techniques in shaping speech of an electively mute boy: a case study. *Perceptual and Motor Skills*, 1970, 31, 463-470.
- Peterson, N. Effect of monochromatic rearing on the control of responding by wavelength. *Science*, 1962, 136, 774-775.
- Picaizen, G., Berges, A. A., Baronofsky, D., Nichols, A. C., and Karen, R. Applications of operant techniques to speech therapy with non-verbal children. *Journal of Communication Disorders*, 1969, 3, 203-211.
- Pineda, M. R., Barlow, D. H., and Turner, B. B. Treatment of a severe speech disorder by behavior modification: a case study. *Journal of Behavior Therapy and Experimental Psychiatry*, 1971, 2, 203-207.
- Robinson, H. M., Monroe, M., Artley, A. S., and Huck, C. S. *The new basic readers, book 4: ventures*. Chicago: Scott, Foresman and Company, 1965.
- Salzinger, S., Salzinger, K., Portnoy, S., Eckman, J., Bacon, P. M., Deutsch, M., and Zubin, J. Operant conditioning of continuous speech in young children. *Child Development*, 1962, 33, 683-695.
- Shearn, D., Sprague, R., and Rosenzweig, S. A method for the analysis and control of speech rate. *Journal of the Experimental Analysis of Behavior*, 1961, 4, 197-201.

- Wahler, R. G. Setting generality: some specific and general effects of child behavior therapy. *Journal of Applied Behavior Analysis*, 1969, 2, 239-246.
- Walker, H. M. and Buckley, N. K. Programming generalization and maintenance of treatment effects across time and across settings. *Journal of Applied Behavior Analysis*, 1972, 5, 209-224.
- Walton, D. and Black, D. A. The application of modern learning theory to the treatment of chronic hysterical aphonia. *Journal of Psychosomatic Research*, 1959, 3, 303-311.
- Yoder, D. E. *Increasing vocal behavior of mentally retarded children*. Unpublished paper presented at the 43rd annual convention of the American Speech and Hearing Association, Chicago, 1967.

Received 30 January 1973.

(Revision requested 7 May 1973.)

(Final acceptance 18 January 1974.)