CHAPTER

21

Establishing Functional Communication Board Use for Nonverbal Aphasic Subjects

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A commonly used alternative communication system for nonverbal aphasic patients is the picture communication board, despite a paucity of experimental data documenting the efficacy of communication board training. A review of the literature reveals only a few case studies dealing with the training of alternate visual communication systems such as Blissymbols (Johannsen-Horbach et al., 1985) and visual communication (VIC) (Gardner et al., 1976). However, no controlled studies investigating communication board training have been reported.

The purpose of the present study was to investigate the acquisition, generalization, and maintenance effects of picture communication board training and to explore procedures to promote generalized use of the board in a naturalistic setting. Specific research questions were as follows:

1. Will subjects acquire accurate pointing responses to communication board items?
2. Will response generalization occur, leading to use of untrained communication board items?
3. Will stimulus generalization occur, resulting in use of the communication board in a naturalistic setting?
4. If stimulus generalization does not occur, will further training result in use of communication board responses in the naturalistic setting?
5. Will responding be maintained over time?

METHOD

SUBJECTS

Subjects were two aphasic adult men who were greater than 6 months post-onset of a single left-hemisphere CVA. Both subjects had auditory acuity no worse than 30 dB HL at 500, 1000, and 2000 Hz in the better ear. The Western Aphasia Battery (WAB) (Kertesz, 1982) was administered prior to initiation of the study. Results yielded profiles consistent with the diagnosis of Broca's aphasia. Verbal expression of each subject was limited to recurrent, nonmeaningful utterances, and written expression was inaccurate except for name (see Table 21-1).

TABLE 21-1. SUBJECT VARIABLES AND TEST DATA

	Subject 1	*Subject 2*
Age	68	68
Etiology	Left CVA	Left CVA
Months after onset	228	46
Western Aphasia Battery:		
Spontaneous speech	0	0
Comprehension	5.75	4.1
Repetition	0	0
Naming	0	0
Aphasia quotient	11.5	11.0
Cortical quotient	20.7	14.3

SETTINGS

Two experimental settings were employed. Treatment and acquisition probes were administered in a traditional treatment room in the speech clinic of a Veterans Administration hospital. Generalization probing and training took place during a coffee hour in a Veterans Administration nursing home care unit. One experimental subject and at least two non-language-impaired nursing home residents participated in coffee hour probes.

PICTURE BOARD STIMULI

Communication boards were constructed using 15 black-and-white drawings of items appropriate for use in a coffee hour setting. The pictures were divided into three sets of five for communicating (1) social responses (e.g., hi and thank you), (2) requests for food and other items (e.g., coffee and cookie), and (3) personal information (e.g., name and occupation).

DESIGN

A multiple-baseline design across behaviors was used with the three sets of communication board responses serving as the three indepen-

dent behaviors. Following a baseline phase, treatment was sequentially applied to each set of communication board responses until all responses had been trained.

Baseline

During baseline, the subject's ability to point to the 15 target responses using the picture communication board was assessed on three separate occasions. In the treatment room, examiner 1 randomly requested each response (e.g., "Show me how to ask for a cookie"). A script providing opportunities for each response to occur was used by examiner 2 to elicit responses in the coffee hour setting. A 5-second response interval was provided following each stimulus. All responses were scored plus or minus according to predetermined criteria, and no feedback was provided.

Treatment

Each treatment session consisted of five randomly ordered trials for each of the five responses in the set currently being trained, making a total of 25 trials per session. Each training trial consisted of presentation of the stimulus (e.g., "Show me how you say 'Hello'") followed by a 5-second response interval. If an accurate response did not occur, the subject was cued with (1) a verbal cue, (2) a model, and (3) a physical assist if necessary. Response-contingent verbal feedback was provided. Probes identical to those taken during baseline were administered daily in the treatment setting and in the coffee hour to provide continuous measurement of acquisition and generalization, respectively. Criterion for progression to the next set of responses was 80 percent correct on treatment probes for 2 of 3 sessions or a maximum of 15 treatment sessions.

If generalized use of the picture communication board in a naturalistic setting did not occur during treatment, two treatment programs to promote generalization were implemented sequentially. Prior to initiation of each generalization training procedure, baseline data were collected to determine responding under the generalization training conditions. Treatment was then initiated on one set of responses at a time while baseline was continued for the untrained sets. Throughout this training, generalization probing in the coffee hour with examiner 2 was continued.

Generalization Training I

In the first training program, examiner 1 utilized a role-playing procedure in the treatment room using the script employed during the coffee

hour probes. For example, the examiner said, "Let's pretend we're at coffee and we are going to tell each other a little bit about ourselves. What kind of work did you do?" During baseline, at least two probes were administered using the script without feedback. In the treatment condition, each of the five responses in training was elicited five times. The previously described cueing hierarchy was utilized when the subject did not respond accurately within 5 seconds, and response-contingent feedback was provided. Following each training session, a probe was taken using the script without feedback, as in baseline, to assess acquisition of pointing responses in this condition. Criterion for progression to a new training set was 80 percent for two of three sessions or a maximum of nine sessions.

Generalization Training II

The second generalization training program, in which examiner 1 accompanied the subject to the coffee hour setting, was initiated when generalized responding was not observed during generalization training I. During baseline in this condition, examiner 1 simply observed as examiner 2 elicited responses using the script as in previous generalization probing. During training, the previously described cueing hierarchy was utilized by examiner 1 on the five responses in training when the subject did not respond accurately within 5 seconds, and response-contingent feedback was provided. Acquisition data were obtained by scoring the subject's first response before cueing and criterion for progression to the next set was 80 percent correct for two of three sessions or a maximum of nine sessions.

Maintenance

Maintenance data were collected for all trained items using baseline probe procedures. After criterion was met for each training set, probing was continued for up to 6 months.

RELIABILITY

Reliability on the dependent variable, the subject's use of the picture communication board, was calculated on approximately 33 percent of the baseline, training, and generalization probe sessions. Point-to-point agreement between the examiner and an independent observer was 98.7 percent. Reliability on the independent variable also was measured to ensure adherence to specified treatment procedures. This was based on

observation of at least one treatment session per treatment phase. Accuracy was reported at 98.6 percent.

RESULTS

Results of the study are shown for subjects 1 and 2 in Figures 21-1 and 21-2, respectively. These data indicate that after stable baselines, requesting and personal information responses, but not social responses, were acquired for both subjects after treatment was initiated. However, acquisition was slower for subject 2 than for subject 1. With regard to generalization, no response generalization to untrained responses was observed as stable baselines on untrained items were maintained. In addition, there was no use of the board during generalization probes in the coffee hour for either subject until session number 23, when subject 1 began to use the board to communicate personal information. Generalization training I did not result in responding above baseline levels during generalization probes for any responses trained for either subject; however, generalization training II resulted in generalized use of all responses trained in this condition except social responses for both subjects. Finally, trained responses were maintained throughout the duration of the study.

DISCUSSION

Findings from this study were consistent with others investigating acquisition of visual communication systems. That is, Gardner et al. (1976) and Johannsen-Horbach et al. (1985) indicated success in teaching aphasic patients to point to pictured symbols representing various actions and objects. The present study, however, indicated that some aphasic individuals perform differently to representations of social responses. This finding, in part, may be accounted for by the fact that the social pictures used in this study were more abstract and less picturable than pictures representing personal information and requests. However, in a similar gestural communication study by Bellaire, Georges, and Thompson (1988), social gestures also were not acquired, suggesting that picturability may not adequately explain this finding. Perhaps more important was the observation that both subjects had some undifferentiated vocal or nonvocal ways to communicate social responses within their repertoire before training began that continued to be used

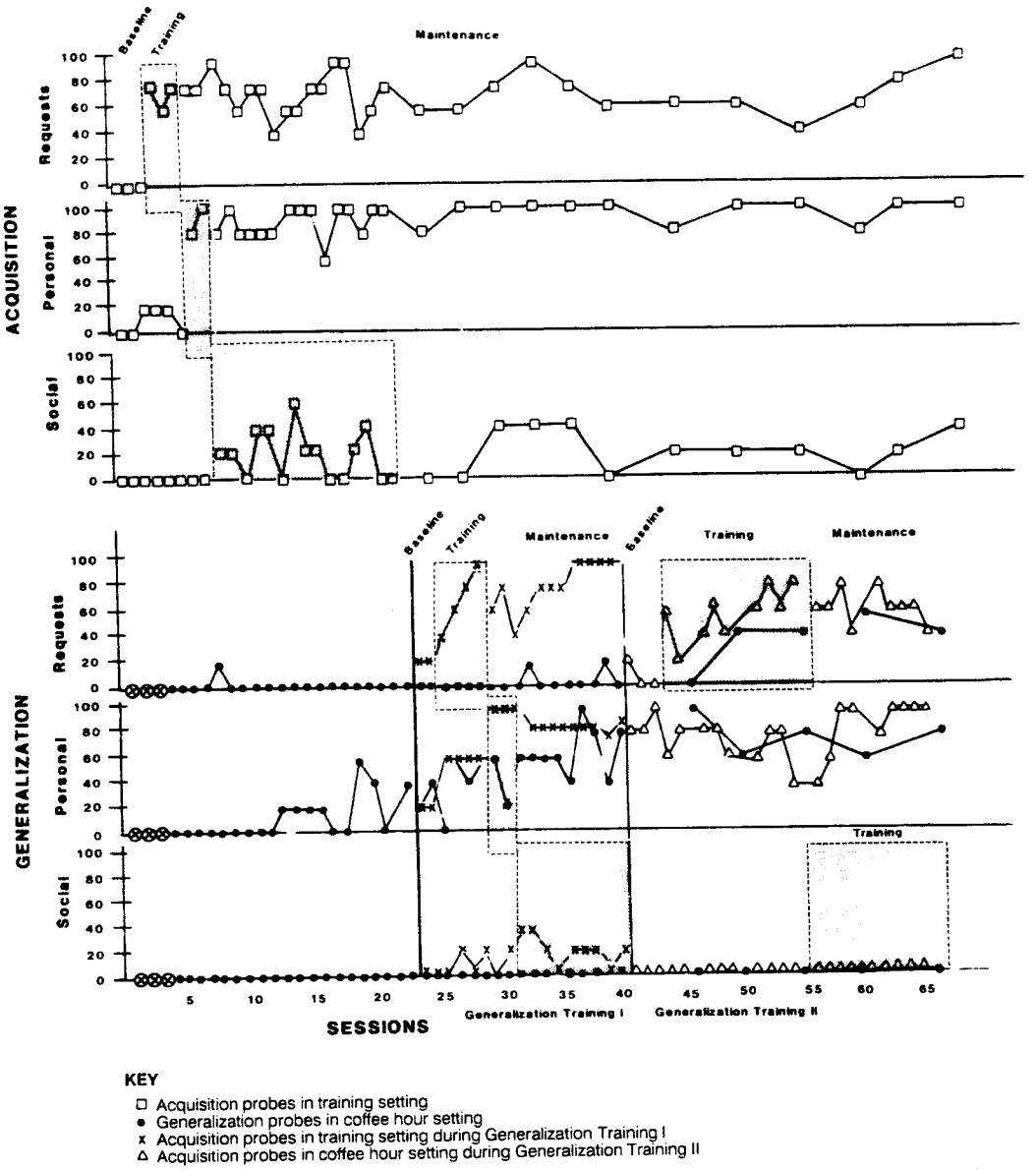

Fig. 21-1. Percent correct pointing for subject 1 on requesting, personal, and social responses on a picture communication board.

throughout the study. These findings suggest that picture boards may not be useful for communicating information that can be conveyed through undifferentiated responses such as head nods. It therefore appears important that boards provided to aphasic patients include primarily pictures that communicate specific content such as items that the patient may want to request or information that he or she may want to convey. The problem, of course, lies in determining what these responses are for individual patients, an issue not addressed in the present study.

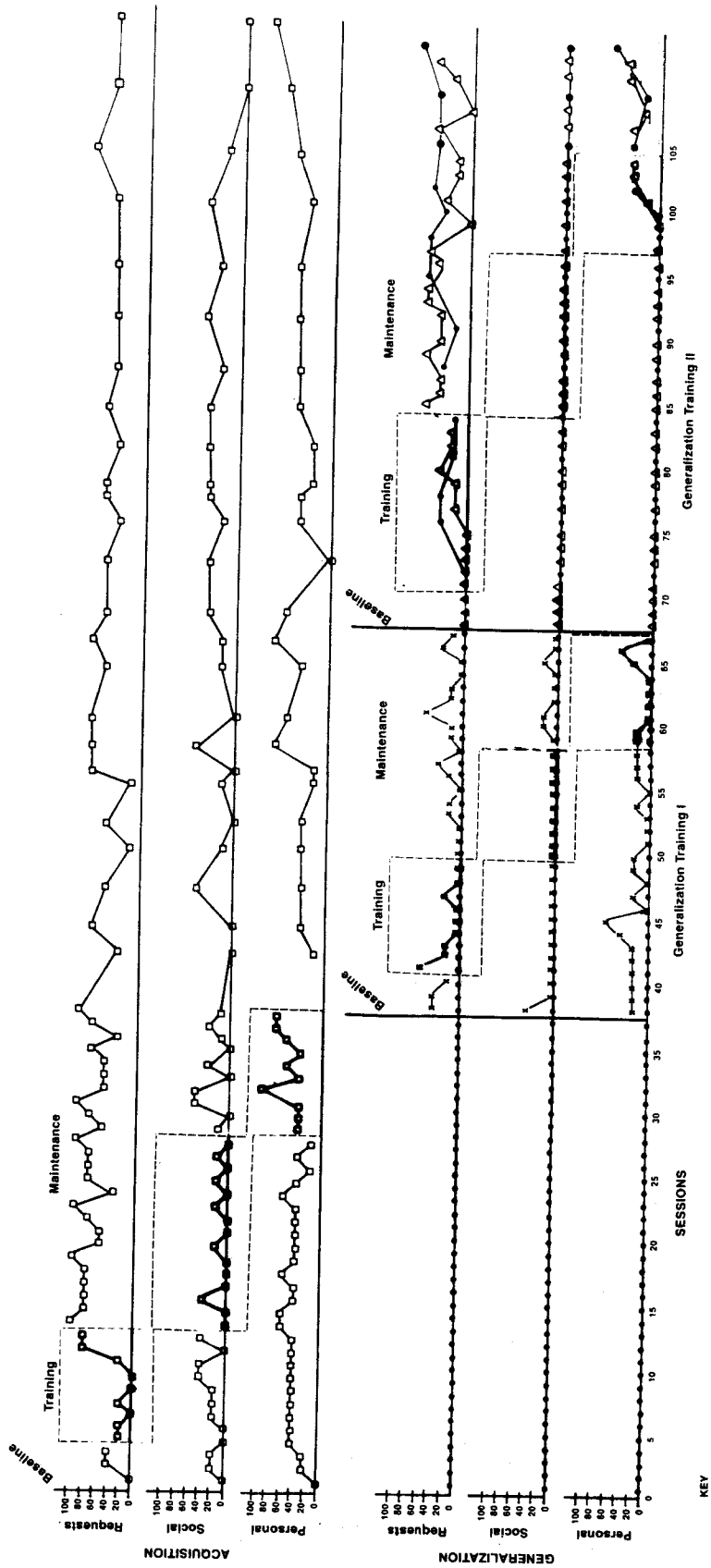

Fig. 21-2. Percent correct pointing for subject 2 on requesting, personal, and social responses on a picture communication board.

The ineffectiveness of the role-playing procedure did not support reports suggesting the appropriateness of role playing for achieving generalization (Aten, Caligiuri, and Holland, 1982; Beukelman and Garrett, 1988). For example, Beukelman and Garrett (1988) cited role playing as a transitional step between the stimulus-response format of treatment and interactive communication. In this study, the role-playing procedure did not by itself result in increased use of the picture communication boards during the coffee hour probes for either of the subjects. It was not until training was conducted within the coffee hour setting that the subjects used their picture boards during generalization probes. One clinical implication is that if picture communication boards are provided, treatment for subjects like those in this study might best be conducted in the natural environments where the board is to be used. Because this is not always practical, additional clinical treatment procedures for promoting generalization need to be explored.

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