

CHAPTER

# 20

**Manual Sign  
Acquisition and  
Use in Two  
Aphasic Subjects**

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Currently there are numerous reports in the aphasia treatment literature that advocate the training of manual signs or gestures (e.g., Baratz, 1985; Bonvillian and Friedman, 1978; Kirshner and Webb, 1981; Moody, 1982; Tonkovich and Loverso, 1982). This therapy approach has typically been applied to those patients whose oral expression has remained functionally limited despite many months of traditional language therapy. These reports have been consistent in their findings that moderately to severely aphasic individuals can acquire single signs or gestures as well as simple grammars. In most of these reports, it also has been assumed that if the aphasic patients were able to *acquire* manual signs, they also would be able to *use* them for spontaneous communication. However, Coelho (1987) and Coelho and Duffy (1985) monitored the use of manual signs acquired by two aphasic subjects in various natural environments, through several hours of observation, and noted that their spontaneous use of these signs was extremely limited.

Recently, the communicative use of acquired manual signs has been addressed experimentally. Bellaire, Georges, and Thompson (1988), using a single-subject multiple-baseline across-behaviors design, examined the acquisition and generalization of manual gestures in Broca's type aphasic subjects. Results indicated that subjects acquired several gestures but that generalization to a naturalistic setting did not occur without additional training to promote generalization.

The purpose of the present study was to investigate manual sign acquisition and use in two aphasic subjects by means of a single-subject multiple-baseline across-settings design. The subjects were taught a variety of manual signs that could be used for ordering a meal and communicative use was monitored in a restaurant. Specific questions addressed were as follows:

1. Can two moderately to severely aphasic subjects acquire a variety of manual signs that could be used for ordering a meal?
2. Will the training of these manual signs in a clinical setting result in generalization to a simulated setting and/or to a natural setting?

## METHOD

### SUBJECTS

Subject 1 was a 57-year-old right-handed man nearly 3 years after onset of a single unilateral left CVA. Premorbidly, subject 1 had been em-

ployed as a steel worker and had a high school education. He demonstrated a right hemiparesis and a moderate to severe nonfluent aphasia. His PICA (Porch, 1981) overall score was 9.9, placing him at the 39th percentile, and his mean percentile of the four auditory comprehension subtests from the BDAE (Goodglass and Kaplan, 1983) was 82. Although subject 1 was previously enrolled in speech and language therapy for approximately 2 years, his oral-verbal expression had remained limited to automatic-type phrases and an occasional appropriate single word or phrase. Subject 1 often attempted to supplement his limited oral-verbal expression through the use of a small notebook that contained a variety of names, dates, and words. He would show his listener a key word or name from the notebook, and the listener could then try to piece the intended message together by asking questions. This technique was marginally effective.

Subject 2 was a 52-year-old right-handed man who was 21 months after onset of a single unilateral left CVA. Prior to his stroke, subject 2, a high school graduate, managed a used-car lot. Subject 2 also demonstrated a severe nonfluent aphasia and a mild to moderate right hemiplegia. His PICA overall score was 8.7, which placed him at the 28th percentile, and his score on the BDAE auditory comprehension subtests converted to a mean percentile of 74. Subject 2 also had received several months of speech and language therapy, but his oral expression was characterized by unintelligible utterances, a few automatic responses, and some profanity.

## *DESIGN*

A single-subject multiple-baseline across-settings design was employed for this study (McReynolds and Kearns, 1982). Baseline was initially established for each subject in each of three settings: clinical, "Easy Street," and natural. The clinical setting was a therapy room in a speech-language pathology department of a rehabilitation hospital. "Easy Street" is a mock village/shopping area, including a bank, a diner, a restaurant, a grocery store, a beauty shop, a movie theater, and a garage all constructed within a 1200 ft<sup>2</sup> room in the same hospital. The "Easy Street" restaurant module was used as the second training setting. The natural setting was a real restaurant outside the hospital where the subjects were to use the trained signs for ordering a meal. Training sessions were conducted twice weekly, and generalization was probed across settings following each training session and in the natural setting on a weekly basis.

## *MANUAL SIGNS*

Twelve manual signs were presented for training. Ten of these signs were taken from either Amer-Ind or ASL, and two were developed for this study. Signs were selected to represent various food items in four general categories: sandwiches (chicken, hamburger, fish); side orders to accompany a sandwich (salad, soup, french fries); beverages (coffee, soda, milkshake); and desserts (ice cream cone, sundae, pie). An attempt also was made to select signs that were iconic and easily adapted for one-handed production.

## *TRAINING*

In the clinical setting, each subject was presented with a picture representing one of the target food items and would be asked to produce the corresponding sign. Accurate sign productions were positively reinforced. If the sign was produced inaccurately, the subject would be requested to imitate the trainer's sign model. If the subject was still unable to produce the sign accurately, the trainer would shape the subject's hand into the correct configuration for the target sign. Each of the four sets of three signs was presented in a randomized order five times in each session. Criterion for sign acquisition in the clinical setting was five consecutive accurate productions on each of two successive days. Once criterion was met for all 12 signs, training began in the "Easy Street" setting.

In the "Easy Street" setting, a subject was seated in the restaurant booth and the investigator, acting as a waiter, would ask questions to elicit the trained signs, for example, "What kind of sandwich would you like? You have three choices." The investigator would then place all three pictures from the target category in front of the subject. Once the subject produced an accurate, appropriate sign, that stimulus picture would be removed and the question would be repeated until all three signs for that category had been produced. If a subject produced an inaccurate rendition of a sign, the same backup steps described for training in the clinical setting would be provided. Criterion for acquisition in the "Easy Street" setting was the same as for the clinical setting.

## *GENERALIZATION PROBES*

At the completion of each training session, probes for generalization were taken. In the clinical setting, the total number of correctly pro-

duced signs to pictorial stimuli were counted (maximum of 12). In the "Easy Street" and natural settings, subjects were to produce manual signs in response to category questions such as, "What kind of sandwich would you like?" The subject was required to indicate his selection from each food category (sandwich, side order, beverage, dessert) by producing only one of the three possible signs in a category, just as one would do in ordering a meal. These category questions were presented in a randomized order in the "Easy Street" setting by the trainer. In the natural setting, these questions were presented in a set order by a variety of waitresses. The pictures used to elicit the signs in the clinical setting were visible when the various questions were presented in the "Easy Street" setting but were not present in the natural setting.

Because plus/minus scoring did not reflect the cueing that was often necessary to elicit an accurate manual sign, each of the manual responses in the "Easy Street" and natural settings was scored using a 3-point scale. If a subject responded accurately to the initial stimulus question in a particular food category, for example, "What kind of sandwich would you like?" he received a score of 3. If the subject did not produce an accurate sign within 15 seconds following the first question, the investigator (in the "Easy Street" setting) or the waitress (in the natural setting) would provide a verbal prompt such as, "Your choices are hamburger, chicken, or fish." An accurate response would then be scored as 2. If the subject still did not produce an accurate manual sign, a final verbal prompt would be provided such as, "Ask me for a hamburger." An accurate response at this point would be scored as 1. An inaccurate production after all prompts was scored as 0. Following completion of the sandwich category, the investigator or waitress would move on to the other three food categories. Maximum score in both settings was 12 points.

### **RELIABILITY**

The subjects' sign productions in each session were scored independently by the investigator and an observer. Point-to-point interjudge reliability for each setting was clinical setting, 99 percent; "Easy Street," 100 percent; and natural setting, 97 percent.

### **RESULTS**

Subject 1's performance across each of the three settings is depicted in Figure 20-1. Following establishment of baseline, treatment was initi-

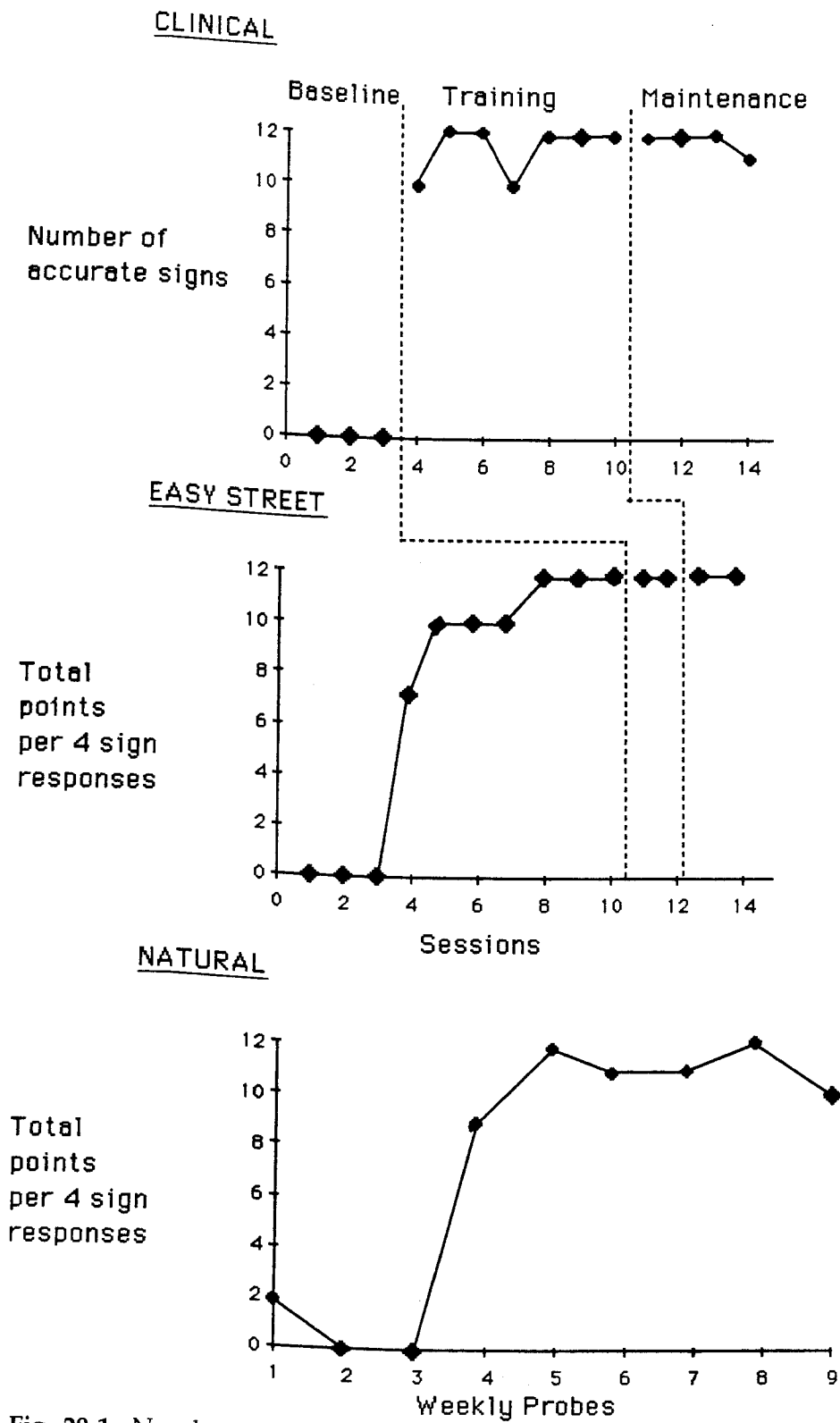


Fig. 20-1. Number of signs accurately produced in the clinical setting and total points per four sign productions in the "Easy Street" and natural settings for subject 1.

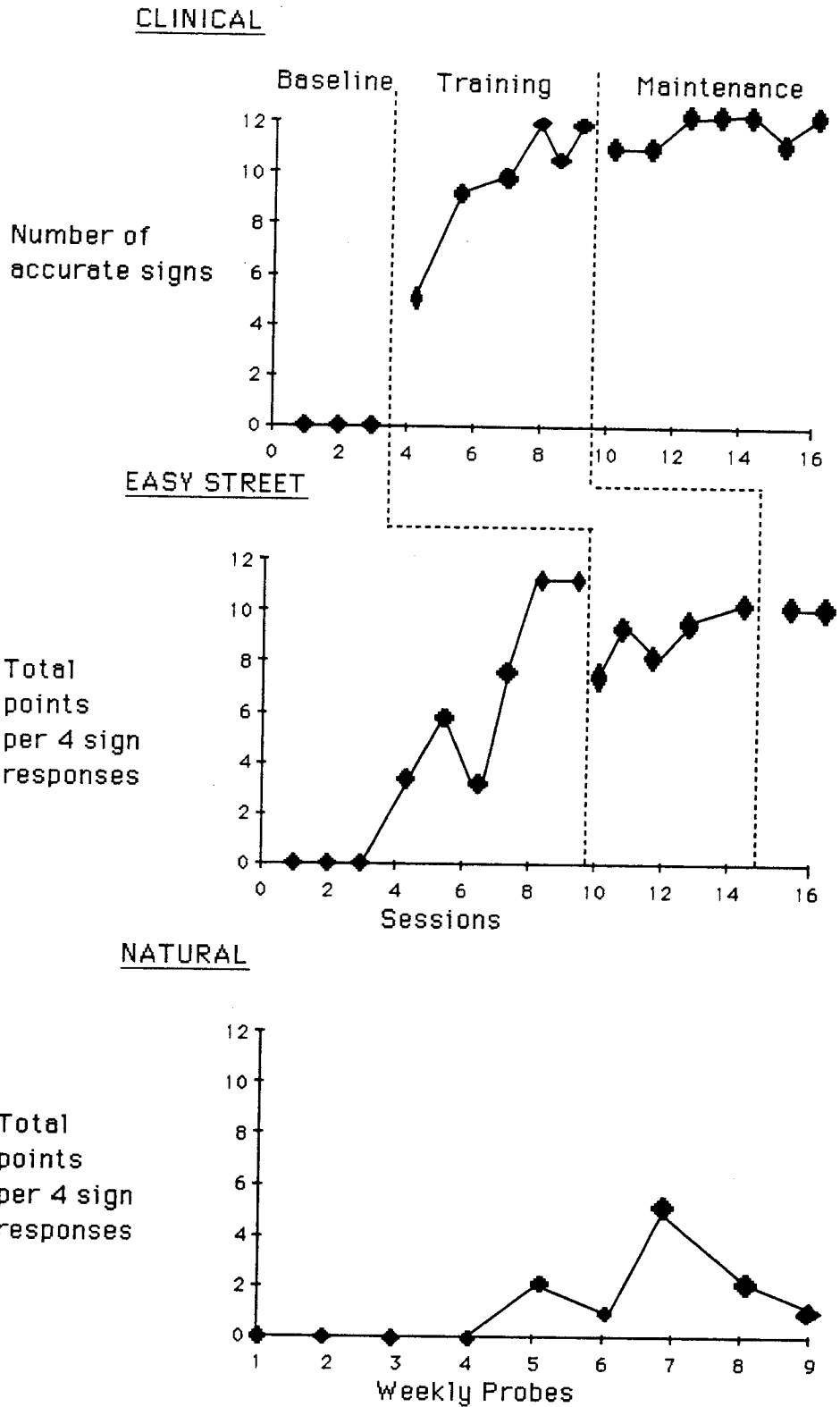


Fig. 20-2. Number of signs accurately produced in the clinical setting and total points per four sign productions in the "Easy Street" and natural settings for subject 2.

ated and criterion in the clinical setting was met after seven treatment sessions. Generalization to the other two settings was noted immediately. By the third training session in the clinical setting, subject 1 was able to produce appropriate manual signs in response to the waitresses' questions in the natural setting. Once treatment was shifted over to the "Easy Street" setting, criterion was met after only two sessions and maintenance was noted in the clinical setting. Two additional generalization probes were taken following completion of training in the "Easy Street" setting that demonstrated maintenance in the clinical, "Easy Street," and natural settings as well.

Figure 20-2 depicts the performance of subject 2 across each of the three settings. Once baseline was established, treatment was initiated and criterion in the clinical setting was met after six treatment sessions. Generalization to the "Easy Street" setting was noted to occur, but at a slower rate and to a less complete degree than was noted with subject 1. Generalization was not observed in the natural setting during this treatment phase. Once treatment was shifted to the "Easy Street" setting, criterion was met after five treatment sessions. Maintenance was noted in the clinical setting, but generalization to the natural setting was minimal. Follow-up generalization probes taken after completion of training in the "Easy Street" setting demonstrated maintenance in the clinical and "Easy Street" settings only.

It also should be noted that during the study, neither subject produced the same four signs repeatedly, that is, attempted to order the same meal day after day.

## DISCUSSION

The results of this investigation have a variety of clinical implications regarding manual sign training with aphasic subjects. First of all, these findings are consistent with those of Bellaire, Georges, and Thompson (1988), who found that their subjects did generalize trained gestures to a natural setting but only with additional training. In the present study, although subject 1's performance was clearly superior to subject 2's in that he was able to produce the appropriate signs in response to the waitress's questions in the natural setting, there is no way to predict what may have happened had the waitress changed the wording of these questions or had deviated in some other manner from the prescribed situational script or had the subject been taken to a different restaurant. These findings are encouraging but should be interpreted cautiously and not as an endorsement for recommending sign training



with *all* aphasic patients. Subject 1 generalized the trained signs from the clinical setting to a very structured natural setting, but true propositional use of these signs was not demonstrated. Furthermore, based on observations of subject 1 and reports from subject 2's family, neither subject attempted to use manual signs for communicating to a greater degree following the training program than was noted prior to its initiation. The results of this study demonstrate that such a research design is useful for investigating the distinction between manual sign *acquisition* and *use* with these individuals, as well as how communicative use may be facilitated.

Second, generalization of the trained signs to the natural setting by subject 1 (PICA overall score 39th percentile) and not subject 2 (PICA overall score 28th percentile) suggests that severity of aphasia may be an important subject variable to consider when selecting candidates for manual sign training programs. Severely aphasic individuals do not appear to be good candidates for this type of intervention. An additional candidacy variable may be an aphasic patient's inclination toward some other type of nonverbal communication technique, for example, subject 1's attempts to facilitate communication by means of his notebook. Such an inclination may be indicative of a patient's motivation or willingness to experiment with different modes of communication.

Finally, although the "Easy Street" setting was useful as an intermediate training step, it should not be used in place of true natural settings in studies such as this. There appear to be certain aspects of real-world settings that cannot be simulated, for example, conversations stopping, persons staring, waitresses' embarrassment, all as the aphasic individual struggles to communicate, and these need to be overcome by the aphasic patient for true generalization to occur.

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