A Comparison of Verbal, Pantomime and Combined Instruction Modes with Severely Aphasic Individuals

Kathryn M. Yorkston
David R. Beukelman
Patricia F. Waugh

Department of Rehabilitation Medicine
University of Washington, Seattle, Washington

In the rehabilitation setting, speech pathologists are often called upon to give clinical management suggestions concerning the most effective means of instructing severely aphasic patients. Review of the literature reveals that there is a growing body of work in the area of auditory comprehension deficits. Some rehabilitation psychologists, including Fowler and Fordyce (1975), suggest that aphasic patients may understand messages delivered gesturally more effectively than messages delivered verbally. Fordyce and Jones (1966) demonstrated that right hemiplegic patients, two-thirds of whom were aphasic, completed peg-board patterns more accurately when instructed by pantomime than when instructed orally. In the speech pathology literature, on the other hand, one finds evidence that aphasic individuals are not only impaired in their ability to comprehend verbal information but also are impaired in their ability to comprehend pantomime. For example, Duffy, Duffy and Pearson (1975) have completed experimental studies which support the conclusion that pantomime comprehension is limited in aphasic patients as compared to normal and other brain damaged patients.

The literature, however, does not address some key questions which need to be answered when making clinical management decisions. The effectiveness of perhaps the most widely used mode of instructing severely aphasic patients, the combination of verbal and pantomimed instructions, has yet to be explored. Further, many of the experimental studies of auditory comprehension deficits reported in the literature do not represent the types of tasks and responses required of aphasic patients in the rehabilitation setting. In order to minimize response difficulty, a picture identification paradigm is often used in the testing of auditory comprehension. For evaluative purposes, it is reasonable that this approach be selected so that inability to make motor responses does not masquerade as an auditory comprehension deficit. However, only rarely outside the clinical testing setting are severely aphasic individuals asked to respond by identifying pictures. More often than not, the instructions that they are being asked to follow in occupational and physical therapies involve complex motor activities. If results based on a picture identification paradigm are to be used for clinical management decisions, experimental work is needed to confirm the relationship between these results and test results where the response is a more complex motor act.

The present study has two purposes. The first is to determine which instruction mode (verbal, pantomime or combined) is the most effective in eliciting responses to single-stage instructions from severely aphasic subjects. The second purpose is to determine if the same pattern of deficits is seen when response to instruction is picture identification rather than object manipulation or body movement. This portion of the study focuses primarily on a testing issue, namely, are picture identification tasks

predictive of performance on other types of tasks, especially in the presence of apraxia which may potentially interfere with performance.

Method

Thirty aphasic individuals participated. All were at least one month post-onset of aphasia resulting from a thromboembolic episode. All scored below the 50th percentile overall on the PICA (Porch, 1967), and all had passed a preliminary screening test in which they demonstrated the ability to use common objects and imitate simple gestures. This screening procedure was designed to eliminate those subjects with severe limb apraxia.

Subjects were asked to follow single-stage commands that might occur in physical or occupational therapies. Ten commands required object manipulation and ten commands required body movements (See Appendix). A treatment by treatment by subjects design was employed. The two treatment variables were instruction mode and response mode.

Instruction Mode

Each command was presented in three instruction modes. The order of commands and instruction modes was randomized within task types with the exception that no two commands were presented consecutively in different instruction modes.

Verbal Instruction. The examiner introduced each item by saying the item number and waiting for the subject to make eye contact before verbally presenting the command. Verbal commands were presented at a conversational rate and intensity. No repetition of a command was given at any time during the investigation.

Pantomime Instructions. The examiner introduced each item by saying the item number. The pantomimed command was presented immediately after the contact was established. In order to insure consistency of pantomime presentation, one examiner administered all tasks to all subjects. The ability of normal individuals to understand the pantomime instructions was confirmed in pilot work.

Combined Instructions. The examiner introduced each command as he had in the other instruction modes. Verbal and pantomimed commands were given in unison when possible. When this was not possible, as in the case of commands which required a movement of the oral structures, the verbal command was presented first, followed immediately by the pantomimed command.

Response Mode

Subjects were asked to respond to each command in two different response modes. The order of conditions across response type was randomized.

Motor Response. Subjects were asked to perform the object manipulation or body movement requested by the command.

Picture Identification. Subjects were asked to point to colored photographs depicting the object manipulation or body movement requested by the command.

Each response was scored as correct or incorrect. On correct responses, notation was also made as to whether or not the response had been prompt, defined here as having been given within three seconds of the completion of the command. An accuracy score (mean percent correct across tasks) was

computed for each subject. Those subjects whose accuracy scores were higher than 95% were excluded from further study and the following analysis was performed on the data obtained from the remaining 19 subjects. Overall PICA scores for these subjects ranged from the 10th to the 49th percentile with a mean of 22nd percentile.

Results

Mean accuracy scores across 19 subjects for the verbal pantomime or combined instruction modes are presented in Figure 1. Examination of Figure 1 reveals that the most accurate scores are achieved with combined instructions, intermediate accuracy is achieved with pantomime, and least accurate scores are achieved with verbal instructions. Analysis of variance and post hoc testing revealed that all of these differences were significant at the .01 level.

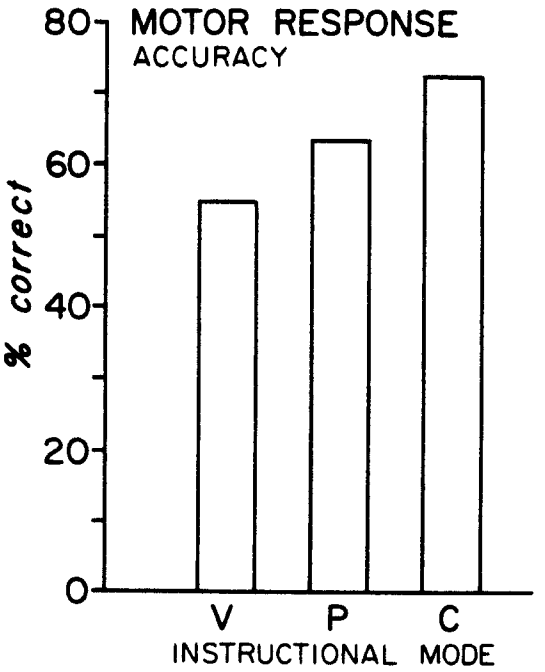

Figure 1. Mean accuracy score (percent correct motor responses to single stage commands) when instructions were given verbally (V), with pantomime (P) or in combined instruction mode (C).

Promptness of response under various instruction modes was compared by computing the percent of correct responses which were prompt. Examination of Figure 2 reveals that the combined instruction mode seems to be the most efficient, in that it results in a greater proportion of prompt responses than either of the other instruction modes. Analysis of variance and post hoc testing revealed that promptness scores under the combined instruction mode were significantly higher than promptness scores under either of the other instruction modes, and that the verbal and pantomime instruction modes were not significantly different from one another.

Because the results presented thus far are based on group means and because the primary aim of this investigation was to answer clinical questions, individual subject profiles were also examined. Figures 3a and 3b contain a series of individual subject profiles. There tended to be two patterns of performance. In the first performance pattern, illustrated

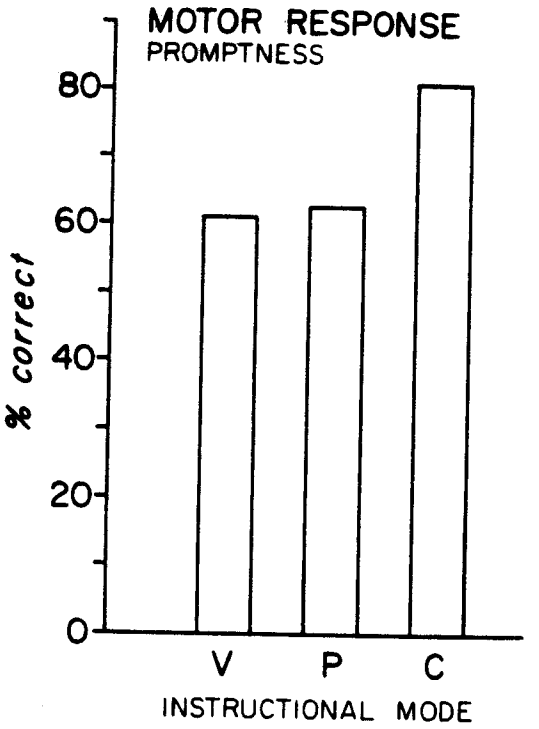

Figure 2. Mean percent correct responses which were prompt when instructions were given verbally (V), with pantomime (P), or in combined mode (C).

in Figure 3a by profiles of three subjects, the combined mode seemed to be distinctly advantageous. In the second pattern, illustrated in Figure 3b, the three instruction modes differed only slightly. These two patterns of performance were seen in 18 of the 19 subjects included in this study. In only one of our subjects did a single modality presentation result in an accuracy more than five percent better than the combined instruction mode. The implication of these results appears to be that the use of a combined verbal with pantomime instruction mode does not interfere with performance, and in many cases may facilitate accurate motor responses.

The second phase of the present study focused on a comparison of accuracy of motor responses compared to picture identification responses. This comparison is illustrated in Figure 4. Examination of the figure reveals that for picture identification responses, the combined instruction mode yielded the most accurate scores. This pattern is similar to that associated with motor responses, except that verbal instructions were not significantly different from pantomime instructions when responses were picture identification. A comparison of the response types reveals that there is a tendency toward more accurate scores when a picture identification rather than a motor response is required. This trend, however, is only significant in the verbal instruction mode. The trend toward higher scores with a picture identification response may result from the fact that picture identification tasks involve a multiple-choice selection while motor response tasks are not a closed response set. Also, apraxia may interfere with performance on tasks which require more complex motor responses.

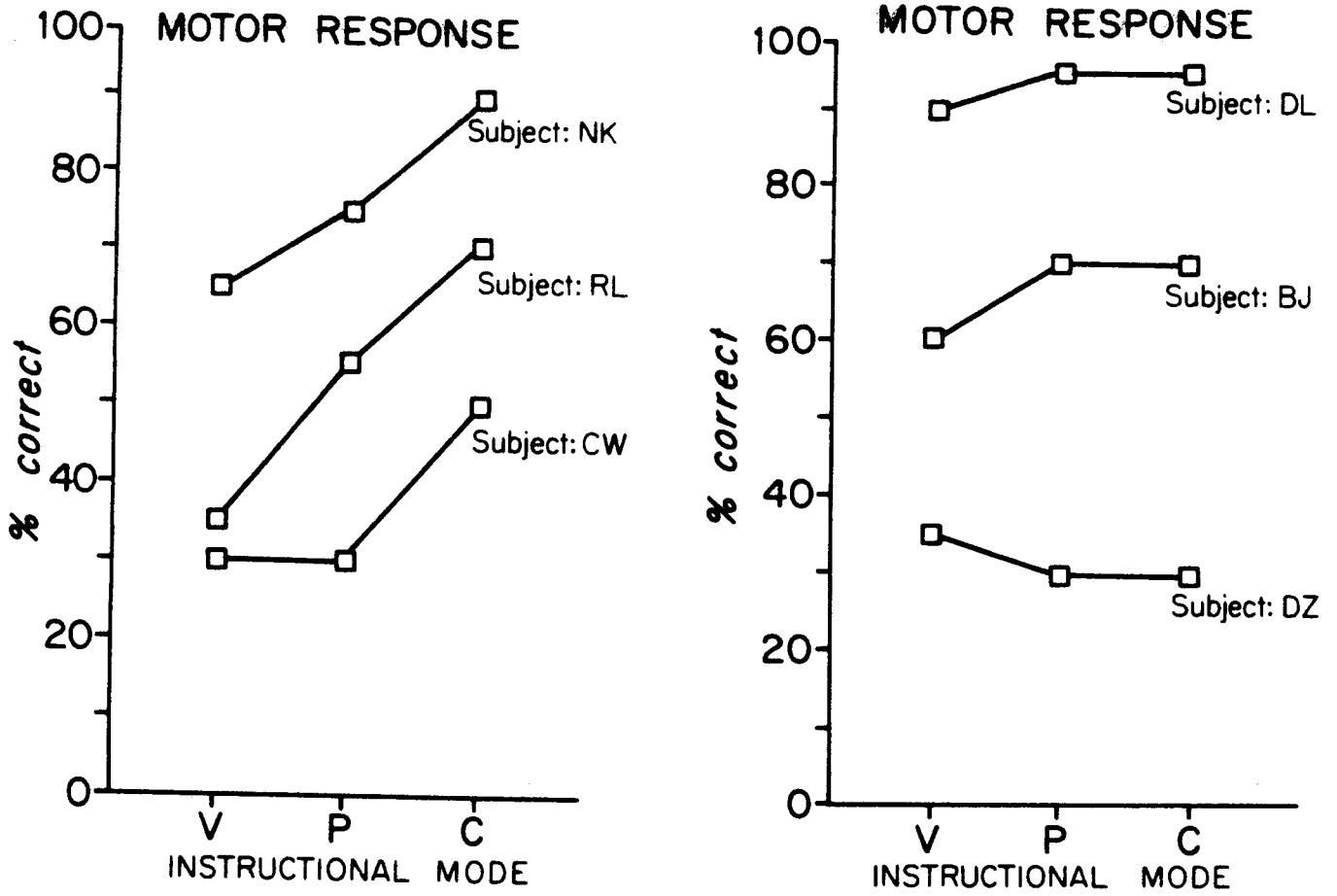

Figure 3. Mean accuracy scores with verbal (V), pantomime (P), and combined (C) instruction modes for three subjects whose scores improved with combined instructions (a) and three subjects whose scores did not vary with instruction mode (b).

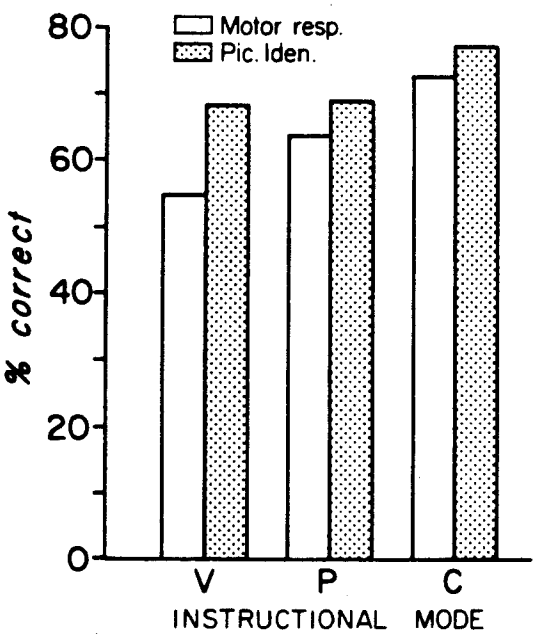

Figure 4. A comparison of accuracy scores when motor responses and picture identification responses are required. Commands were presented verbally (V), with pantomime (P), and in a combined instruction mode (C).

Despite the fact that group means for motor responses and picture identification responses were similar, a look at individual profiles reveals a somewhat different picture. Figures 5, 6, 7, and 8 illustrate a series of individual profiles on the six experimental tasks. For some subjects picture identification tasks resulted in higher scores than motor response tasks (Figure 5). For some subjects, picture identification tasks resulted in lower scores (Figure 6). For some subjects response types were equivalent (Figure 7). For other subjects, there appears to be an interaction between instruction mode and response type (Figure 8). In order to explore the relationship between picture identification and motor response tasks more closely, Pearson product-moment correlations were computed between motor response scores and picture identification scores. Although these correlations were significant for instruction modes (for example $r = .52$ for the combined instruction mode) they are lower than might be expected for two such similar tasks. The implication for testing appears to be that picture identification tasks are not strongly predictive of performance on tasks which require other kinds of responses, at least for severely involved patients. This suggests that in order to make predictive statements about auditory comprehension of instructions requiring motor responses, these responses need to be tested.

To summarize briefly, there is a strong tendency for the combined instruction mode to elicit more accurate and prompt responses from aphasic individuals than verbal or pantomimed instruction alone. This trend is especially strong when motor performance is required. Second, performance on picture identification tasks may not be strongly predictive of performance on similar auditory comprehension tasks with more complex motor responses. The focus of this study has been on short, simple auditory commands, and the trend toward more efficient performance with combined instruction mode has yet to be confirmed for longer, more complex commands.

Appendix

OBJECT MANIPULATION TASKS

1. Brush your teeth (toothbrush)
2. Cut with a knife (table knife)
3. Blow your nose (handkerchief)
4. Smoke a cigarette (cigarette)
5. Pound with a hammer (hammer)
6. Comb your hair (comb)
7. Wash your face (wash cloth)
8. Cut with a scissors (scissors)
9. Write with a pencil (pencil)
10. Drink from a cup (cup)

BODY MOVEMENT TASKS

1. Open your mouth
2. Raise your hand
3. Close your eyes
4. Lick your lips
5. Move forward
6. Put your hands together
7. Turn your head
8. Lift up your leg
9. Cough
10. Make a fist

Discussion

Q: Did you analyze the data further? For example did you include both axial and distal commands and, if so, did you analyze for that effect?

A: The body movement commands include both axial and distal commands, but they were not analyzed separately. However, we did perform one

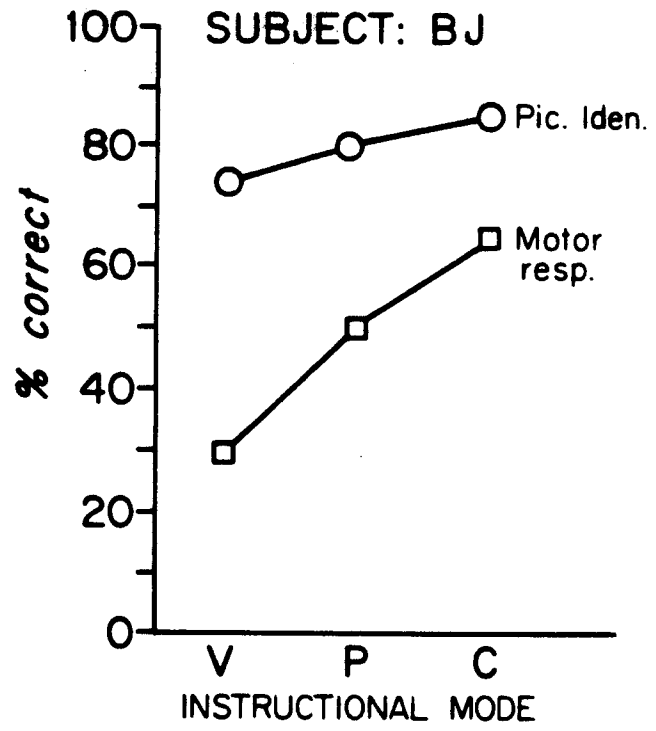

Figure 5. Profile of performance on six experimental tasks for Subject BJ.

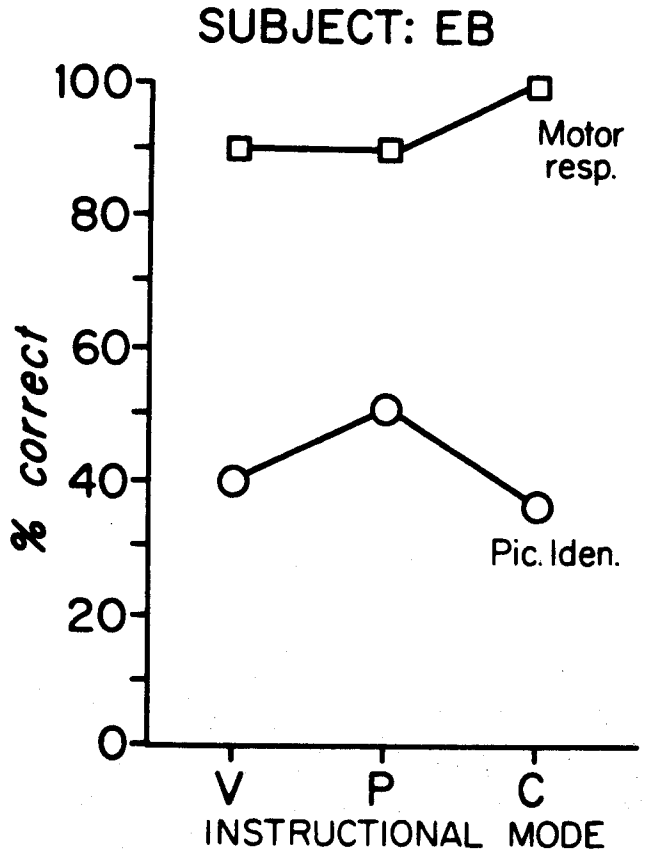

Figure 6. Profile of performance on six experimental tasks for Subject EB.

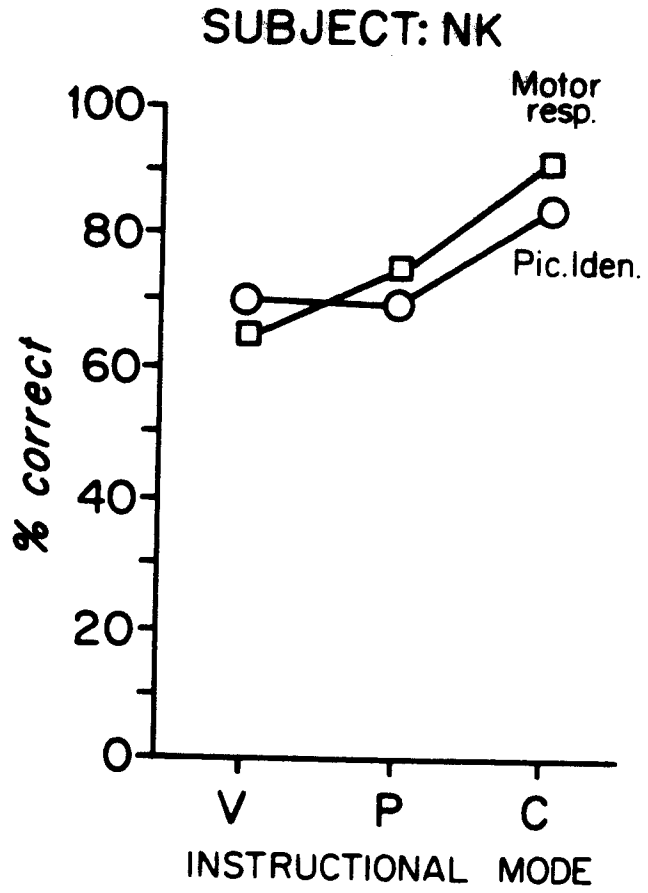

Figure 7. Profile of performance on six experimental tasks for subject NK.

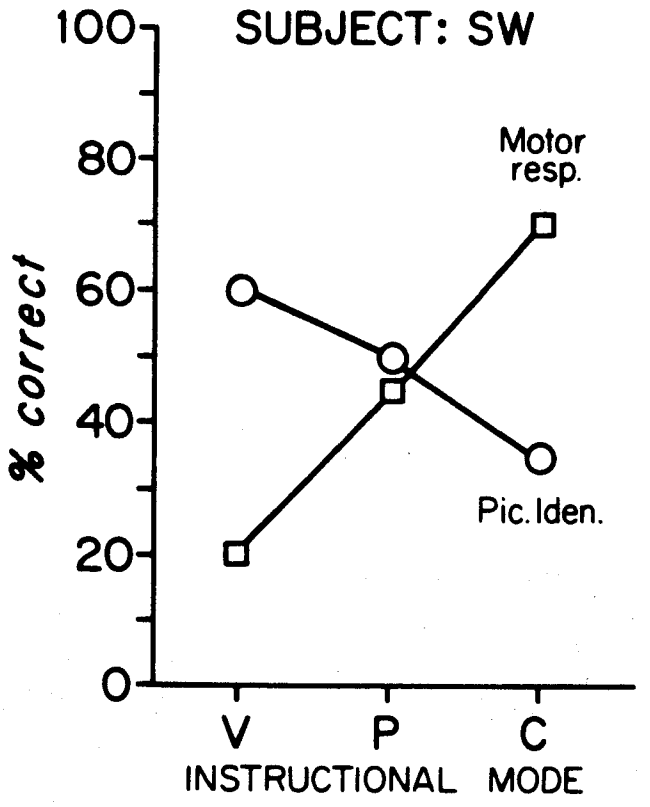

Figure 8. Profile of performance on six experimental tasks for Subject SW.

additional analysis which looked at differences between body movement commands and object manipulation commands. The results of this analysis indicated that responses to body movement commands tended to be more accurate than responses to object manipulation commands.

Q: In your two graphs of individual subject profiles of performance on the motor response tasks, one group tended to improve with combined instructions and the other did not. Do you have any explanation for this? Were there any other distinguishing characteristics of these two groups?

A: With a population as severely aphasic as the one studied here, one could speculate that a variety of factors could interfere with performance. For example, inconsistent attention to the task might have interferred with performance. With the group whose performance improved with combined instructions, one might speculate that the redundancy of the combined instructions helped to break through the inattention. We did look at one factor which did not distinguish between the two groups. That factor was severity of aphasia.

Q: Could there have been an order effect across instructional modes?

A: We controlled for the order effect by randomly sequencing the verbal, pantomime and combined instructions for a given response type.

Q: I'm presently developing a descriptive scaling system for limb apraxia. Did you include in your study any descriptive analysis of the incorrect responses?

A: Since we were not looking for precision of motor response, but rather for an indication of whether or not the commands were comprehended accurately, we did not subdivide the incorrect responses into any descriptive categories. We were also "generous" in our judgement of correct motor responses, not requiring the motor performance to be precise.