

A Comparison of Auditory-Verbal, Visual-Verbal, and  
Visual-Non-Verbal Presentation of Commands to Aphasic Adults

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The implementation of a successful treatment regimen depends upon the recognition of various modality strengths and weaknesses within a given aphasic patient. From careful observations, it is possible for a clinician to manipulate linguistic and nonlinguistic variables that may improve the communication skills of patients. For example, the use of the visual channel has long been employed to improve auditory comprehension (e.g., gestures, pictures), and oral expression (e.g., the communication board). While this modality has been utilized for aiding communication, it has not been truly exploited for more complex acts (e.g., commands). To this end, the investigator devised a method whereby the visual modality could be used to convey sentence-level material with limited use of traditional linguistic units (i.e., printed words). Similarly, it was also the intent of the investigator to compare performance on this set of items to those presented through the auditory-verbal and visual-verbal modes.

METHOD

Subjects. Participating in this study were 15 aphasic adult males from the Veterans Administration, Edward J. Hines, Jr. Hospital. All subjects demonstrated premorbid right handedness, left cerebrovascular accident, medical stability, no previous CNS incident, and English as a native language. For this study, those possible subjects demonstrating visual acuity, visual perceptual, and visual field deficits were omitted to reduce any visual problems that could confound the results.

Procedures. Subjects were asked to perform three tasks differing only in the manner of presentation. The first 40 oral commissions were presented to the subjects. These were similar to commands found in the Token Test (DeRenzi and Vignolo, 1962) except that common objects were substituted for the geometric forms (e.g., "Put the cup next to the pencil"). Levels of item length and relative difficulty were increased as follows:

Level 1: 1 noun; 1 verb; 3 words

"Touch the cup."

Level 2: 2 or 3 nouns; 1 verb; 6 words

"Touch the cup and the key."

"Touch the key, watch, and pencil."

Level 3: 2 nouns; 1 verb; 1 preposition; 6-7 words

"Put the key in the cup."

Level 4: 3 nouns; 1 verb; 1 preposition, 9-10 words

"Put the watch and the key in the box."

Level 5: 4 nouns, 2 verbs; 2 prepositions; 12-14 words

"Put the pencil between the cup and the card and turn over the watch."

Commands were presented once, with only one repetition, given upon request of

the subject. A thirty second time limit was established to insure continuous movement through the procedure. A forced response paradigm was used to collect a maximum number of responses.

The second task was designed to be the visual-verbal homolog of the auditory-verbal one. The same 40 commands were printed on white, unlined, 5 x 7 inch cards. Subjects were presented with the cards one at a time and expected to manipulate the items accordingly. Exposure of the card was limited to 30 seconds and a forced response paradigm was also employed.

The third procedure was designed to be the visual-non-verbal counterpart of the preceding two. More specifically, the subject was presented with a visual representation of the command (Figure 1). The command was portrayed through the use of arrows to depict the movement of one object to a new position with respect to the other objects. As in the other two tasks, length of item exposure was restricted to 30 seconds and a forced response paradigm was employed.

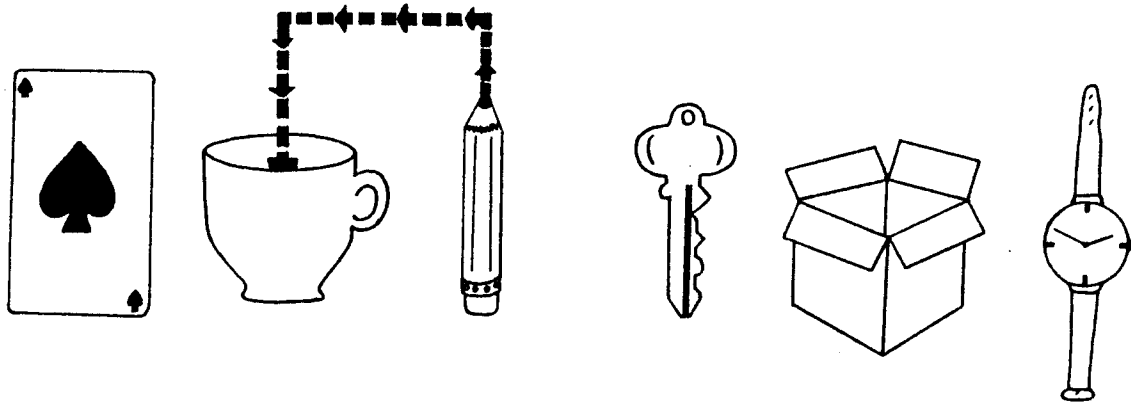


Figure 1. Visual nonverbal representation of "Put the pencil in the cup."

Subjects were instructed to look at the diagram and move the objects accordingly. A short pretest session was used to assure that the subject understood what was expected. All subjects demonstrated understanding of task requirements, thereby allowing them to participate in the study.

Responses in all three experimental procedures were scored for number of total item correct/incorrect. An analysis of variance for repeated measures was used to analyze the data.

#### RESULTS AND DISCUSSION

A hierarchy of performance was observed for the three tasks, with the greatest number of correct responses occurring on the visual-non-verbal items ( $p < .05$ ), next greatest were in response to auditory-verbal stimuli, and the least number occurred to visual-verbal stimuli (Table 1). Post hoc analyses revealed that both auditory-verbal and visual non-verbal modes were significantly different from visual-verbal, but that differences between auditory-verbal and visual-non-verbal groups were non-significant. There was a trend towards the visual non-verbal method of presentation, in that ten of the 15 subjects tested exhibited improved performance through the use of these stimuli.

Table 1. Individual and group scores for Auditory-Verbal, Visual-Verbal, and Visual-Nonverbal modes of presentation.

Subject	Auditory Verbal	Visual Verbal	Visual Non-Verbal
1	18	04	18
2	26	09	22
3	13	00	16
4	32	20	25
5	20	07	29
6	12	00	17
7	22	10	28
8	18	04	23
9	19	00	24
10	26	10	24
11	13	00	19
12	16	00	24
13	29	11	36
14	19	04	18
15	19	02	18
mean	20.0*	5.4*	22.7*

\*maximum score was 40

These results suggest that even when there is a moderate to severe depression of performance in a strictly linguistic mode of presentation, there exists a means of adequate receptive communication. Such communication can be achieved through a nonverbal visual channel. As to the reasons for this relative success, we can only speculate and suggest that the right hemisphere may be participating in much the same way it does on block design, constructional tasks, and the like.

The clinical implications are interesting in that a visual sign/symbol system, much like the universal traffic signs, gestures, or Amerind, might be employed and facilitate the receptive skills for aphasic patients. Unlike gestures (which are transient) or pictures (which display only one word at a time) this form of presentation depicts messages of varying lengths and remains static. With this system, the patient has more information, presented for a longer period of time, and with greater semantic load. From our results, it appears that modification of such a system to facilitate auditory receptive skills might be feasible.

#### REFERENCES

- DeRenzi, E. and Vignolo, L.A. The Token Test: A Sensitive Test to Detect Receptive Disturbances in Aphasia. Brain, 85, 665-678, 1962.

## DISCUSSION

Q: Was there any significant difference between visual-non-verbal and auditory verbal?

A: No.

Q: Do you think that this form of stimulation could improve auditory comprehension?

A: We are presently engaged in determining the efficacy of this procedure. We have the protocol and are collecting our data. I hope to report on this next year.

Q: Did you present the picture and leave it there?

A: Yes.

Q: Perhaps if the stimulus were removed, it would force them to verbalize (inner-speech) it.

A: Interesting thought. It may be useful.

Q: Did your commands always go from left to right?

A: Yes.