

Comprehension in Severe Aphasia: A Second Look

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Aphasic clients demonstrate impairment of auditory processes commensurate with the severity of their language deficit. Substantial information has been provided as to the effects of phonologic, semantic, syntactic, and other factors on the auditory comprehension of aphasic persons. This information is useful to the clinician in assessment and treatment planning for moderately and mildly aphasic persons, but is somewhat limited in its applicability to severely aphasic individuals.

In recent years, there has been increasing interest in the auditory comprehension of severely aphasic patients. This may stem from the fact that these patients comprise the majority of our clinical caseload (Marshall, Tompkins, Rau, Phillips, and Golper, 1979), and that scoring systems have been developed that permit the clinician to capture the features of severe patients' performance (Holland, 1980; Boller and Green, 1972). Surprisingly, patients with severe language deficits retain certain language capacities to an unexpected degree. Boller and Green (1972) found that severely involved patients recognized foreign language and distinguished between nonsense and meaningful language. In a 1974 investigation, these same authors found that subjects responded better in face-to-face than in tape recorded situations, and comprehended commands better than yes/no or informational questions. Wapner and Gardner (1979) have shown that global aphasic patients can localize geographic locations on a map significantly better than they can identify objects in the test room. And, in a longitudinal study of three cases of "total aphasia," comprehension was found to improve more than naming and reading (Mohr, Sidman, Stoddard, Leicester, and Roenberger, 1973). Similarly, Kertesz (1979) pointed out that patients who improve beyond a "global state" are distinguished from those who do not by their improved auditory comprehension.

Finally, clinical observations indicate that severely aphasic patients utilize a variety of paralinguistic and contextual cues in situations where successful communication depends on auditory comprehension and attention. For example, it is not uncommon for a patient to be unable to "point to cigarette" on Test VI of the Porch Index of Communicative Ability (Porch, 1967) but to produce a package of Camels when asked "Have you got a cigarette?". The ability of severely aphasic patients to use compensatory strategies in reception and expression appears to be directly related to how they get along in the world. The present study represents an attempt to provide additional information about the auditory comprehension abilities of these patients.

The purpose of this study was to ascertain the effects of auditory-visual and auditory presentations on severely aphasic subjects' comprehension of three stimulus forms: commands, yes/no questions, and information questions.

METHOD

Eight severely aphasic adults participated in the study. All incurred aphasia following cerebral vascular accidents involving the left hemisphere.

Descriptive data for these subjects are shown in Table 1. Patients were selected who manifested marked comprehension impairments on the auditory comprehension subtests of the Boston Diagnostic Aphasia Examination (Goodglass and Kaplan, 1972) and on the basis of their ability to respond to simple questions and commands such as "Is Christmas in December?" and "Show me how you salute." Although many subjects had difficulty responding verbally, all exhibited the "basic ability" to respond to other modes or mode combinations.

Table 1. Descriptive Data for Subjects.

S	AGE	MPO	DIAGNOSIS	BDAE
				<u>Auditory Comprehension</u> Z-Score
1	49	84	Global	- .80
2	61	1	Conduction	+ .10
3	52	15	Global	-1.00
4	52	38	Global	-1.25
5	59	30	Global	-1.50
6	61	1	Wernicke	+ .40
7	65	13	Global	-1.10
8	61	3	Global	-1.65
\bar{x}	57.50	23.13		- .85

PROCEDURE

Each subject responded to ten commands, ten yes/no questions, and ten information questions in an auditory-visual (A-V) and auditory (A) condition. The list of stimulus items is provided in the Appendix. Two information questions, "How many feet are in a yard?" and "How many years have you been married?" were formulated for the study. The remaining stimuli were selected from an apraxia battery designed by DeRenzi, Pieczuro and Vignolo (1966) and comprehension subtests of three aphasia batteries; the Boston Diagnostic Aphasia Examination (Goodglass and Kaplan, 1972), the Western Aphasia Battery (Kertesz, 1980) and the Minnesota Test for Differential Diagnosis of Aphasia (Schuell, 1965). Commands, yes/no and information questions were matched for length and recorded on a Sony videotape recorder in random order at a slightly slower than normal rate. The ten information questions contained five "How many?" and five "What do?" questions because these kinds of WH questions have been found to be the easiest for aphasic persons (Gallagher and Guilford, 1977). The 30 stimulus items could be answered accurately with nonverbal responses.

In the A-V condition the subject heard the 30 stimulus items while viewing the examiner on a 21" black and white television monitor. For the

auditory condition, the monitor screen was covered and the subject responded to the same 30 stimulus items. Order of presentation modes was counter-balanced across subjects and three practice items were presented prior to administration of the task items in each mode. The videotape recorder was stopped after each stimulus and the subject given as much time as needed to respond. Repeats were provided on request (this occurred rarely), but responses following repeats were not scored. Throughout administration of the tasks, the examiner sat across from the subject and scored responses.

Responses were scored 3, 2, 1, or 0. Three points were given for "correct" responses; two points were awarded for "adequate" or "in the ballpark" responses. One point was given for responses that were incorrect but in which the subject exhibited some understanding of a salient feature of the stimulus. For example, if when asked the question "Does the sun rise in the west?", the subject gave the rising-setting gesture by sweeping his hand across his face, one point was awarded. Clearly incorrect responses or failure to respond received no points.

Reliability. Interscorer reliability was determined by having a second examiner simultaneously score the sixty responses of two subjects. The examiner and the second scorer agreed on 114 of the 120 responses (93%). Intrascorer reliability was determined by videotaping one of the subjects and having the examiner rescore the tape two weeks later. Agreement was attained on 59 of the 60 scores (98%).

RESULTS

Subjects' scores and group means for the three stimulus forms (commands, yes/no, and information questions) for the A-V and the A conditions are shown in Table 2. Group means are depicted in Figure 1.

Table 2. Subjects' raw scores and group means for commands, yes/no, and information questions in the auditory/visual (A-V) and auditory (A) conditions.

	A-V			A		
	COMMAND	YES/NO	INFO	COMMAND	YES/NO	INFO
<u>Subject</u>						
#1	26	22	27	27	18	26
#2	28	28	23	21	28	24
#3	15	12	19	11	14	13
#4	25	24	15	26	23	10
#5	17	16	11	10	12	7
#6	30	28	29	30	26	22
#7	24	5	13	18	5	5
#8	1	26	4	6	19	2
\bar{x}	20.75	20.13	17.63	18.63	18.13	13.63

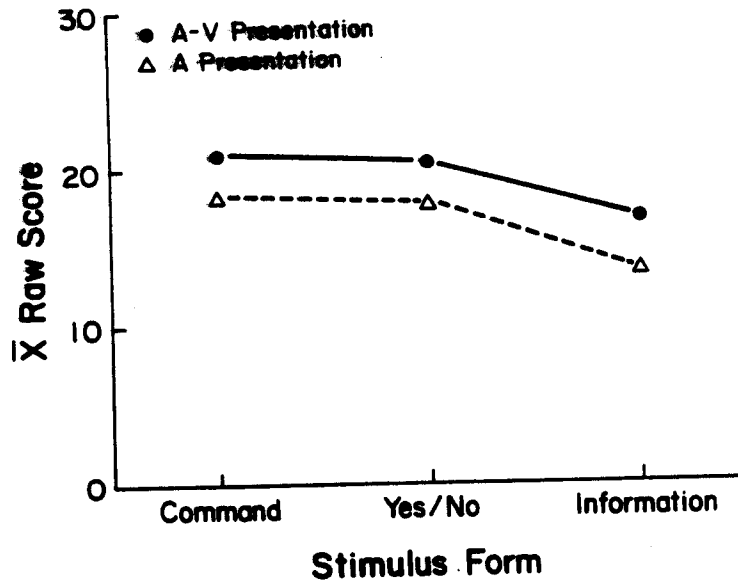


Figure 1. Mean of subjects' scores for A and A-V presentations.

A three-way Analysis of Variance (Winer, 1971) which considered the effects of presentation mode, sentence type, and the interactions among these variables was performed. Subjects had significantly higher scores for the A-V than the A condition ($F = 28.21, df 1,40; p \leq .01$). Inspections of group means for the three stimulus forms shows that subjects had higher scores on commands and yes/no stimuli than on information questions. However, these differences were not significant.

Separate Analyses of Variance were carried out to determine if differences existed in the type of responses elicited by the three stimulus forms. For these analyses, data from the A-V and A conditions were pooled.

Figure 2 shows the mean number of responses scored as "correct," "adequate," "incorrect with comprehension of a salient feature," and "incorrect" for commands, yes/no, and information questions. Significant differences in the distribution of the various response types were found for the commands ($F = 5.61; df 3,21; p < .01$). Subsequent Newman-Keuls tests revealed that subjects had significantly more correct responses than any other response type for commands. Significant differences in response types were not present for yes/no and information questions.

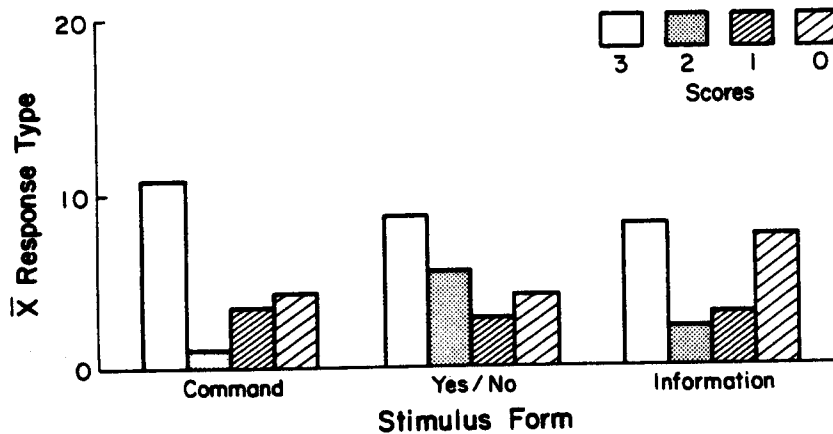


Figure 2. Distribution of response types for commands, yes/no, and information questions.

DISCUSSION

Subjects performed significantly better on commands, yes/no, and information questions when these stimuli were presented in auditory-visual condition than auditory condition. This generally supports an earlier study by Green and Boller (1974) using similar stimulus forms; however, the latter utilized live face-to-face presentations and tape recordings, whereas the present study used videotape presentations in which the subject was permitted (or denied) the opportunity to view the television monitor. The superiority of the A-V condition may occur from the fact that being able to view a "live" examiner either on videotape or in person provides an attending stimulus for the subject to prepare him for the oncoming stimulus.

Subjects scores for the three stimulus forms were not significantly different, a finding which differs from results of Green and Boller (1974). This may have resulted from the fact that subjects were permitted to respond in any output modality, while Green and Boller required verbal responses. In addition, the methodology employed in the present study, which involved indirect wording of commands, using a slower presentation rate, and selecting easier WH question forms may have minimized task demands. The cumulative result from these efforts may have equalized the task requirements and minimized any differences in performance on the three stimulus forms.

Inspection of the type of responses made by subjects to the various stimuli revealed some interesting trends. Commands appeared to be the easiest stimulus form for the severe aphasic patients in this study. They made significantly more "correct" responses on commands; conversely, they tended to respond to commands in an all-or-none fashion. Subjects nearly always seemed to recognize a yes/no question, possibly because of its inflectional pattern. The overwhelming majority of responses to yes/no questions were correct or adequate. This is not surprising, because the probability of responding in one of these two ways is equal. Previous work presented at this conference by Gray, Hoyt, Mogil and Lefkowitz (1977) has illustrated that the various yes/no questions within aphasia test batteries are not of equal difficulty. This underscores the need to develop reliable yes/no responses with aphasic clients. Finally, the distribution of subjects' response types for information questions was binomial; they either responded correctly, or they responded erroneously. The results of our study support previous findings suggesting that even the most severe aphasic subjects retain certain rudimentary comprehension abilities.

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APPENDIX

List of Test Items*

- | | |
|---|------|
| I want you to stick out your tongue. | (1) |
| Now, please puff out your cheeks. | (5) |
| I'd like you to make a fist. | (7) |
| Now, I want you to raise your hand. | (8) |
| Show me how you lick your lips. | (12) |
| Now, I'd like you to clear your throat. | (13) |
| Now, show me how you wave goodbye. | (15) |
| I want you to shut your eyes. | (17) |

*Number in parenthesis indicate actual order of presentation.

Okay, now, snap your fingers. (22)

I'd like you to open your mouth. (27)

Are bicycles faster than trains? (2)

Is winter warmer than summer? (3)

Should children disobey their parents? (9)

Does the sun rise in the West? (20)

Is a horse larger than a dog? (23)

Are the lights on in this room? (24)

Do apples grow on trees? (25)

Do you cut grass with an axe? (28)

Are towns larger than cities? (29)

Are you wearing red pajamas? (30)

What do you wear on your feet? (4)

What do we tell time with? (10)

What do you do with a pencil? (11)

What do you do with soap? (14)

What do you do with a razor? (18)

How many days are in a week? (6)

How many things in a dozen? (16)

How many feet are in a yard? (19)

How many children do you have? (21)

How many years have you been married? (26)