

On the Assessment of Naming Disturbances  
in Adult Aphasia

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The study of naming in adult aphasia has been of special interest to aphasiologists, since this capacity seems to be almost universally impaired in aphasia, regardless of type. Several variables have been identified which may influence naming performance. One such variable which has received relatively little attention is the situational context in which the aphasic patient must use specific words.

Aphasic patients' production of specific words in response to confrontation naming tasks is reportedly often quite different from that during the course of connected speech (Oldfield and Wingfield, 1965; Green, 1970). Moreover, a number of investigators have reported that differential naming performance in confrontation naming versus connected speech varies with the type of aphasia (Jakobson, 1956; Luria, 1975). According to these observers, aphasic patients with anterior brain damage tend to be facilitated when involved in a confrontation naming task, but experience great difficulty when producing specific words in running speech. In contrast, patients with posterior brain damage may perform much better in connected speech than on a confrontation naming task.

#### EVALUATION OF NAMING ABILITIES

Despite the fact that naming performance appears to vary with the situation in which the patient is placed and despite the fact that many authors recognize the significance of substantive-word production within conversational speech (Benson and Geschwind, 1971; Goodglass and Kaplan, 1972), standardized tests for aphasia do not typically provide for the systematic comparison of naming performance across various situations and contexts. Furthermore, the likelihood that certain differences in performances may even characterize different syndromes of aphasia has not been considered.

The three standardized tests which, at present, appear to be most commonly used clinically are the Boston Diagnostic Aphasia Examination (BDAE) (Goodglass and Kaplan, 1972), the Minnesota Test for Differential Diagnosis of Aphasia (MTDDA) (Schuell, 1965), and the Porch Index of Communicative Abilities (PICA) (Porch, 1967). With the BDAE, it is possible to obtain a rating of word-finding in running speech (defined as "informational content in relation to fluency"), in addition to obtaining scores for confrontation naming and naming in response to questions (responsive naming). Although this rating may be compared to the confrontation naming and responsive naming scores in an attempt to detect naming performance discrepancies

among the three contexts, the appropriateness of such a comparison would be questionable. Specifically, since different target words are included on the confrontation naming and responsive naming subtests and these words are also likely to differ from those spontaneously produced in conversation, it would not be possible to determine with confidence whether performance differences were based upon the actual situational contexts utilized for naming, or on the use of different words within them.

Schuell's test, the MTDDA, includes one subtest which represents an attempt to examine naming behavior in the context of running speech (picture description), as well as subtests for confrontation naming, sentence completion, and naming in response to questions. However, like the Boston Test, the MTDDA does not provide for systematic comparison of performances across these contexts, since different target items are included in each of them.

The PICA, in contrast to the two tests previously discussed, does provide for systematic comparison of naming performance on a confrontation naming task and a task requiring the completion of open-ended sentences with the same target names. However, this test does not provide a subtest on which the patient is able to produce the names within running speech which is self-generated.

When examining the influence of situational context on the naming performance of aphasic patients, it is essential that the target words be held constant, while only the situational context is varied. Furthermore, it is also important to include a task which approximates spontaneous speech so that naming on more traditional tasks, such as confrontation naming, may be compared to naming in a situation which is more representative of functional communication.

#### DEVELOPMENT OF MATERIALS FOR COMPARISON OF NAMING IN DIFFERENT SITUATIONAL CONTEXTS

Since naming performance appears to vary across situational contexts and since many authors emphasize the importance of naming performance in spontaneous speech (Goodglass and Kaplan, 1972, p.6; Benson, 1979), test materials were designed which would allow for the systematic comparison of naming in two different situations—confrontation naming and picture description. It was hoped that this test procedure would prove to be of diagnostic value and would also provide information which would be valuable in therapy planning.

##### Target Word Frequency and Length

Forty picturable nouns were selected according to the frequency with which they occur in the language (twenty high frequency words and twenty low frequency words). Both the Teacher's Workbook of 30,000 Words (Thorn-dike and Lorge, 1944) and A Computational Analysis of Present Day American English (Kucera and Francis, 1967) were utilized in word selection, and all of the items chosen for inclusion in the test procedure were listed within the same designated frequency range (high or low) in both sources. The twenty high frequency target words occur among the thousand most commonly used words in the English language, whereas the twenty low frequency nouns range from among the third thousand to about the tenth thousand in frequency of occurrence.

In addition to frequency of occurrence, the length of the words included on the test was also controlled. Fifteen of the words within both high and low frequency groups were one syllable in length and the remaining five words in each group ranged from two to five syllables in length.

#### Picture Materials for the Test

Aphasic patients' naming performances do not seem to be importantly influenced by the nature of the visual materials used. Corlew and Nation (1975), for example, were unable to demonstrate differential performance between tasks requiring the naming of line drawings versus the naming of real objects. Thus, provided that the materials are clear and unambiguous, essentially the same results should be obtained regardless of the type of stimuli utilized. To elicit confrontation naming responses in the present study, simple, clear line drawings of the forty nouns selected were made. These were depicted on individual cards 5-1/2 x 4-1/4 inches in size.

In addition to the individual pictures, ten 8-1/2 x 11 inch composite pictures, each containing pictorial representations of four of the same nouns within a pictorial context, were drawn. These pictures would be used to elicit naming responses in the picture description task, where the target words would be evoked in a context of running speech. The four elements included in each composite picture were balanced such that two of them were high frequency and the other two were low frequency. Figure 1 shows a sample composite picture.

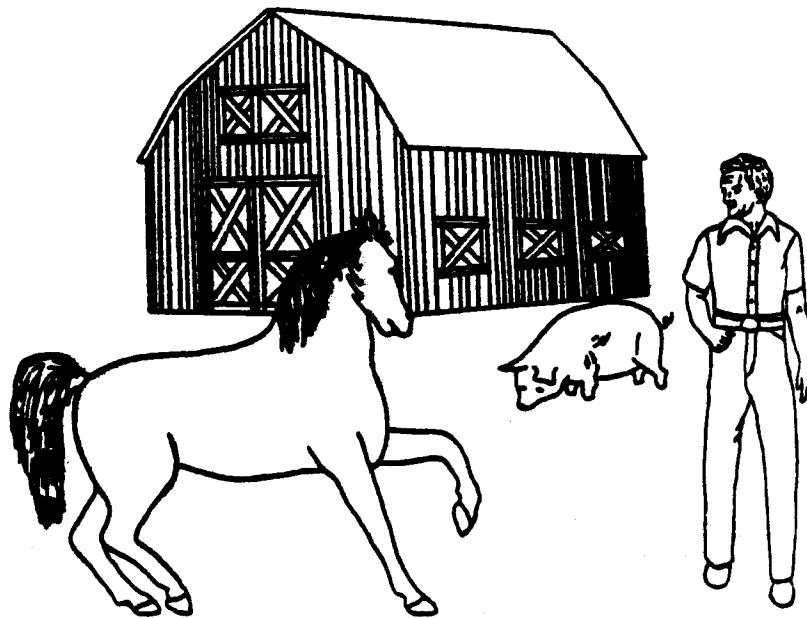


Figure 1. Facsimile of a composite test picture for picture-description.

Figure 2 shows the four corresponding individual pictures.

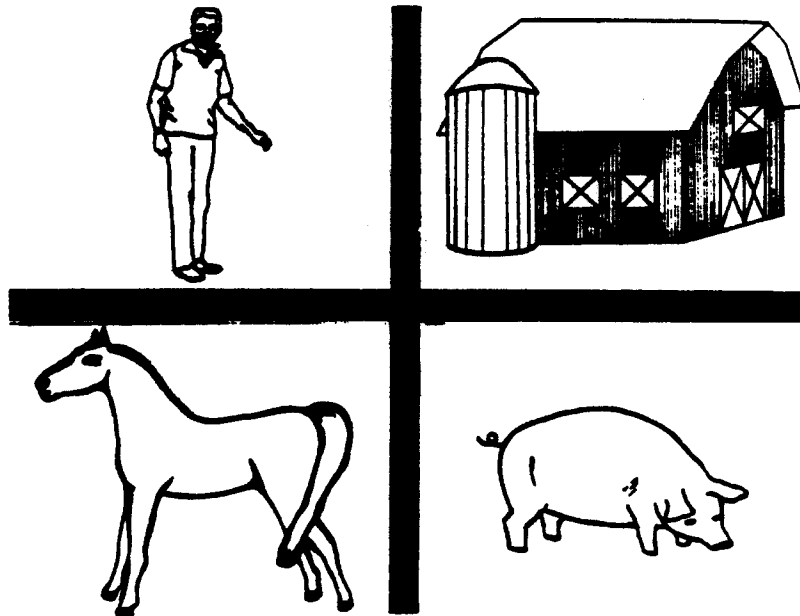


Figure 2. Facsimile of four individual test pictures for confrontation-naming.

Although the speech elicited by picture description tasks is not strictly equivalent to spontaneous speech it does provide a context of running speech within which specific words may be retrieved and spoken. In addition to the verbal context which is typically elicited in a picture description task, the composite pictures designed provided a visual context which frequently included closely related items. Gardner (1973) has stated that by using composite pictures, it is possible to "compare naming facility across a variety of pictorial environments and to reduce the abstractness of the task by presenting elements in their customary context" (p.215).

Schuell (1973, p.67) felt that picture description was useful as a test for eliciting maximal language from aphasic patients. In addition, when examining naming abilities, picture description tasks provide a means of controlling the target words, whereas in spontaneous speech this is not often possible. Therefore, the description of composite pictures appears to provide an appropriate means for eliciting naming performance in connected speech that may be compared to single-word confrontation naming.

#### Pilot Testing with Normal Individuals

Since the ultimate goal was to utilize these materials to study naming performances of aphasic patients, it was important to insure that they would elicit the desired target names from normal subjects. Eight normal subjects were tested in an attempt to determine the adequacy of the stimuli. The

performance of these subjects indicated that some modifications of the pictures would be necessary in order to consistently elicit the desired target responses. Consequently, revisions of the pictures in question were made.

A second group of sixteen normal subjects, ranging in age from 28 to 85 years, was tested with the revised materials. With two further modifications, the stimulus items evoked the desired target responses with at least 80% accuracy in both the confrontation naming and the picture description tasks. The remaining responses were synonyms for the target words.

#### INVESTIGATION OF NAMING PERFORMANCE OF APHASIC PATIENTS

Subjects. Forty aphasic patients, evenly distributed among the syndromes of Broca's, Wernicke's, conduction, and amnesic aphasia, were studied using the final set of stimulus materials. These patients were all medically stable at the time of testing, according to a physician's judgment, and were able to produce at least some real words in a meaningful context.

#### Administration and Scoring of the Naming Tests

For the purposes of stimulus presentation, the composite pictures were randomly divided into two groups, P1 and P2. The individual pictures used for confrontation naming were also divided into two groups, C1 and C2. C1 consisted of the twenty individual pictures which were also used as elements of P1; and C2 consisted of those individual pictures which were included as elements of P2. For administration to each subject, the items within each of these four sets were randomized.

In an attempt to guard against possible order effects, the orders in which the four sets of pictures were presented was counterbalanced within each group of aphasic patients. In addition, it should be noted that the groups of individual pictures for confrontation naming (C1 and C2) were never presented immediately prior or subsequent to the group of composite pictures (P1 and P2) in which the same vocabulary items were also depicted.

Practice items were administered prior to both the confrontation naming and picture description tasks. These items were repeated, as necessary, until the patients' responses indicated that they understood the requirements of the tasks. The formal test items were then administered.

All patients' responses were scored from the written transcriptions of the tape recorded testing sessions. For the purposes of this study, responses were simply classified as either correct or incorrect. Correct responses included the target names, synonyms which had been produced by normal subjects in the pilot study (e.g., "physician"/doctor), and a few synonyms which were not produced by the normal individuals, but were judged by the investigators to be reasonable synonyms for the target words. Neologisms, grammatical errors, and phonemic errors, as well as whole-word substitutions which were not synonyms for the target words, were classified as incorrect. Accurate productions of the target words which were produced after a delay which exceeded that of normal individuals (3 seconds), were also classified as incorrect. Labored or distorted productions of target words which were prompt and did not alter the phonemic structure of the word by omission, transposition, substitution, or addition, were considered to be correct.

## RESULTS

### Confrontation-Naming versus Picture-Description

The raw data for each patient was examined regarding the direction of change in performance on the two naming tasks. The patients with Broca's and Wernicke's aphasia showed opposing patterns. Eight of the ten patients with Broca's aphasia performed better on the confrontation naming task than on the picture description task (of the remaining two patients, one performed equally on the two tasks, while the other performed better on the picture description task). In contrast, eight of the patients with Wernicke's aphasia performed better on the picture description task (one of the remaining patients performed equally on the two tasks, while the other performed better on the confrontation naming task).

Table 1 contains the scores on the two tasks for each patient in each syndrome of aphasia and clearly depicts the different performance patterns displayed by patients with Broca's and Wernicke's aphasia. As can be seen from Table 1, patients with Broca's aphasia obtained scores on the confrontation naming task that were an average of 9.7% higher than the scores obtained on picture description. In contrast, patients with Wernicke's aphasia obtained scores on the picture description task that were an average of 10% higher than their scores on confrontation naming. Analysis of variance and subsequent simple effects testing demonstrated that these effects were statistically significant. Specifically, patients with Broca's aphasia performed significantly better when naming items on the confrontation naming task than when engaged in the picture description task ( $p < .011$ ). In contrast, the patients with Wernicke's aphasia performed significantly better when naming items in connected speech elicited in the picture description task ( $p < .007$ ).

For neither the group of amnesic nor conduction aphasia was the direction of change in performance between the two naming tasks consistent. That is, some of the patients in each of these groups performed better in confrontation naming than in picture description, whereas others displayed the opposite performance pattern. The data contained in Table 1 reflect the inconsistency of the naming performance patterns displayed by these two groups of aphasic patients. These individual differences would be important in the evaluation and treatment of naming disorders within a clinical setting. As expected, the analysis of variance and subsequent simple effects testing demonstrated that the type of naming task did not systematically affect the performance of patients with conduction or amnesic aphasia ( $p > .89$  and  $p > .25$ , respectively).

In addition to examining the direction of performance change on the two naming tasks, it was of interest to look at the degree of change, irrespective of direction. When absolute differences between scores on the two naming tasks were considered (irrespective of the task on which a higher score was obtained), the mean percentage differences between the two tasks were 10.8%, 12.5%, 13.5%, and 6.0% for the groups of Broca's, Wernicke's, amnesic, and conduction aphasia, respectively. These percentages indicated that when direction of performance change was not considered, the group of patients with amnesic aphasia displayed the largest differences in scores received on the two naming tasks. Absolute percentage differences between scores on the two naming tasks were also relatively large for patients with Broca's and Wernicke's aphasia. In marked contrast to the degree of change exhibited by these groups, the patients with conduction aphasia received

scores on the two tasks which differed by only a small percentage. Thus, the naming performances of patients in this diagnostic group appeared to be the least influenced by the particular naming task employed, compared with the remaining three groups of aphasic patients.

Table 1. Differences between scores on confrontation naming (CN) and scores on picture description (PD).

Raw Scores			Raw Scores		
CN	PD	Difference	CN	PD	Difference
Broca's			Wernicke's		
28	20	8	16	29	- 13
25	18	7	19	27	- 8
27	21	6	11	18	- 7
16	11	5	18	24	- 6
35	30	5	27	22	5
32	27	5	6	10	- 4
19	16	3	22	26	- 4
32	30	2	9	11	- 2
6	8	- 2	7	8	- 1
22	22	0	5	5	0
		$\bar{X} = 3.9$ (9.7%)			$\bar{X} = -4.0$ (10%)
Amnesic			Conduction		
22	33	-11	16	12	4
32	22	10	37	33	4
19	26	- 7	5	8	- 3
22	29	- 7	16	19	- 3
23	28	- 5	28	31	- 3
26	22	4	7	4	3
25	21	4	17	16	1
32	35	- 3	11	12	- 1
5	8	- 3	12	13	- 1
24	23	1	19	18	1
		$\bar{X} = -1.7$ (4.3%)			$\bar{X} = 2.0$ (5%)

#### Correlation of Performance on the Two Naming Tasks

Correlations between patients' performance on the confrontation naming and the picture description tasks were calculated to determine the extent to which a given patient's performance on one of the tasks was predictive of his performance on the other. Pearson correlation coefficients revealed that the strength of the relationship between these two sets of scores varied with the type of aphasia. Strong correlations were observed for patients with Broca's and conduction aphasia ( $r = .94$ ,  $p < .001$  and  $r = .96$ ,

$p < .001$ , respectively), a moderate-to-high correlation was found for patients with Wernicke's aphasia ( $r = .83$ ,  $p < .002$ ), and the lowest correlation (which did not reach statistical significance) was revealed for the patients with amnesic aphasia ( $r = .54$ ,  $p < .055$ ).

These findings suggested that, at least for patients with amnesic aphasia, scores on one of the naming tasks could not be predicted from scores on the other naming task. The clinical implications for this finding are important. Specifically, standardized aphasia test batteries which only assess patients' naming capacities in a confrontation naming situation or in other situations requiring single-word responses, may misrepresent some patients' capacities in running speech.

## DISCUSSION

The findings of this investigation suggest a number of diagnostic and therapeutic implications. First, the findings clearly indicated that naming performance on the confrontation naming task, as typically assessed on standardized tests of aphasia, was not necessarily representative of patients' naming performances in connected speech as elicited on the picture description task. In many patients, discrepancy between the two scores was considerable.

For the patients with amnesic aphasia, in particular, a high or low score on one of the naming tasks was not necessarily mirrored by a score at the same level on the other task (indicated by the nonsignificant correlation obtained between scores on the two naming tasks). This suggests that, for these patients, a diagnosis of naming impairment based solely on a confrontation naming task may not be at all indicative of the problems encountered in connected speech. An adequate picture of naming capabilities and, hence, the development of appropriate treatment plans, would not be possible without knowledge of naming performance in both situations.

For patients with Broca's and conduction aphasia, the correlations obtained between performances on the confrontation naming and the picture description tasks were strong, with a moderate-to-high correlation obtained for patients with Wernicke's aphasia. Thus, for patients in these groups, a diagnosis of naming impairment on the basis of confrontation naming would, in general, provide a reasonable estimate of naming impairment in connected speech. However, despite these moderate-to-high correlations, striking discrepancies between total scores on the two tasks were sometimes observed for individual patients. To avoid making erroneous assumptions, therefore, diagnosticians would be well-advised to assess naming in both situations, irrespective of type of aphasia.

In addition to its importance in diagnosis, determination of which situational context elicits the best performance for individual patients is an important consideration for therapy planning. The ultimate goal of aphasia therapy is to improve patients' communication. In pursuit of this goal, it is essential to begin with tasks in which patients may experience some success, a notion which is consistent with Brookshire's (1972) findings. Therapy then, as most experienced clinicians would agree, should progress gradually from items or tasks which are easier for patients to those which are more difficult. Therefore, a determination of the situational context in which patients' naming abilities are facilitated would seem to be necessary.



## SUMMARY

Current standardized tests for aphasia do not provide for a systematic comparison of naming performance across various situations and contexts. Since naming performances of aphasic patients appear to vary across situational contexts and many investigators have emphasized the importance of naming performance in connected speech, a test procedure was designed to systematically examine aphasic patients' naming in two different situations: confrontation naming and picture description. The stimulus materials were modified according to the responses of normal subjects. The final set of stimulus materials was then utilized to study forty aphasic patients, evenly distributed among the syndromes of Broca's, Wernicke's, amnesic, and conduction aphasia. This research demonstrated that the influence of situational context on the naming performance of aphasic patients appears to have important ramifications, both diagnostically and therapeutically.

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#### DISCUSSION

- Q: Did you find that differences in performance patterns varied with the severity of the patients' naming problems?
- A: Yes. That was part of the analysis of variance. There was no group effect, indicating that the groups of aphasic patients did not differ significantly in terms of level of severity.
- Q: What I'm really wondering is if you pooled all the groups of aphasic patients and grouped them by severity so that you could look at the patterns of performance in relationship to severity of the patients' problems?
- A: Once again, the fact that there were no differences across the groups indicates that, even if I had rank-ordered them in terms of severity, there would not have been a relationship between severity and performance pattern displayed.
- Q: Several papers presented at this conference in the past have discussed the possible importance of visual imagery in terms of improved performance when describing contextual pictures. I came in late for your paper. Did you talk about the role of imagery as it may facilitate performance?
- A: You are referring to Penny Myer's paper presented at last year's conference. Because of the nature of the picture-description task included in my study, it is impossible to determine whether it was the verbalization that facilitated the performance of the patients with Wernicke's aphasia or the visual context. We have now designed a study to try to determine whether visual context does, in fact, have a facilitative effect on some patients' performances, independent of their verbalizations.
- Q: How far post onset were most of these patients?
- A: These patients were an average of two years post onset. There was no significant difference in the number of months post onset for the four groups of aphasic patients studied.
- Q: Do you think that the way you defined errors had anything to do with the results you obtained?
- A: For the purposes of this study, we defined correct responses as those which were essentially normal. We later grouped error types into fourteen different categories and changed the definition of correct responses to be more lenient. The results of the analyses performed using more lenient criteria for correct responses did not change our conclusions; they merely helped to explain the basis for the initial results we had obtained.

- Q: Sarah, did you by any chance run the subjects in multiple exposures to the same conditions?
- A: No, I didn't. The patients were only exposed to each condition once.
- Q: It seems to me that, particularly with amnesic patients, your results would be strengthened if you could demonstrate that, within a condition, you had stability over repeated exposures to that same condition, in addition to the differences between the conditions.
- A: I think that would certainly strengthen the results.
- Q: When one does an analysis of behavior, one needs to not only hold the response constant, as you have done, but one also needs to vary the response, while holding the situation constant. We need to keep this in mind when making conclusions about naming behavior.
- A: Yes.
- Q: Did you analyze any type of interaction between high and low-frequency words and naming performance?
- A: Yes, I did. In general, the high frequency words were named better than the low frequency words across both naming tasks.
- Q: Did you happen to look at operativity? Gardner found that operativity had a more pronounced influence on naming performance than word frequency.
- A: I think that by only using picturable nouns, my target items could all be considered to be relatively operative in nature; that is, they could each be experienced through a number of different sensory modalities.
- Q: Did you ever consider yourself as having a sample of forty patients from one population, namely aphasia, and look at the results in this manner? Or, were your patients always grouped according to syndromes?
- A: The patients were always grouped into four syndromes for my analyses. However, I also informally examined the relationship between site of lesion and performance patterns displayed. This relationship was found to be quite interesting, especially for the patients with amnesic aphasia. However, because my time is up, I will not be able to expand on that now.