

Letters From An Aphasic Individual:
A Linguistic Investigation

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Introduction

Understanding of the neurolinguistic basis of aphasic disorders of spoken language is more advanced than that of written language. It has generally been reasoned that integrity of written language is dependent on functionality of spoken language. Aphasiologists have traditionally regarded Wernicke's aphasia as an inseparable syndrome of defective auditory/verbal and, therefore, visual/graphic processes. Normal writing is very rare in cases of aphasia; writing is usually impaired at least to the same degree as speaking. But recent evidence (Lecours & Rouillon, 1976, Hier & Mohr, 1977) has come to light showing that subclassifications allowing for variable performance in different modalities may be necessary. The present study also attempts to modify the traditional view of language competence in Wernicke's aphasia. Spontaneous graphic expressions, i.e., letters written over a period of four months, provided accessible evaluation of the nature of the language disruption in the graphic modality. Careful examination reveals linguistic competence which might otherwise be ignored. Thus, communicative functionality can be achieved through the graphic modality as well.

Subject

The patient studied is a 60-year-old, right-handed, white male, with a diagnosis of Wernicke's aphasia. Nine months prior to this investigation, the man suffered infarction in the posterior branch of the left middle cerebral artery secondary to respiratory failure. EEG and brain scan confirmed left temporal lobe pathology. Residuals of the cerebrovascular accident included fluent aphasia and compensated right homonymous hemianopsia. Past history revealed chronic obstructive pulmonary disease with resection of the right lower lobe and chronic alcoholism. He has a tenth grade education and has not been gainfully employed for 23 years. The man lives alone.

Intensive inpatient language rehabilitation was conducted the first three months following onset. Since that time the patient has been seen twice weekly. The self-cueing technique, utilizing writing to compensate for his verbal difficulty was encouraged. He was urged to keep a personal notebook while an inpatient. During this time, he resumed writing letters to his sister. Following discharge from the hospital, the patient began writing diary-like letters to his speech pathologist. He acknowledged using a dictionary. It

was felt that opportunity for self-expression compensated somewhat for his minimally stimulating communication environment.

Test Results

Evaluation of communication skills has been conducted at periodic intervals. Most recent scores of standardized aphasia tests are as follows:

Porch Index of Communicative Ability (1971) showed an overall communication percentile of 82 when based on left-hemisphere data. (Gestural, 78 percentile; Verbal, 50 percentile; Graphic, 93 percentile.)

Boston Diagnostic Aphasia Examination (Goodglass & Kaplan, 1972) revealed a severity rating of 2.0 and Z-score profile compatible with a Wernicke's aphasia.

Present language skills on the basis of the above tests are as follows:

Spontaneous Speech - The patient is fluent with phonemic paraphasias outnumbering semantic paraphasias. Grammatical constructions are retained but misused leading to disruption of the semantic content.

Repetition - The man can repeat single digits and words. Repetition of complex material is severely impaired.

Naming - Visual confrontation naming is markedly impaired. Difficulty is relatively equal in naming members of different semantic categories, e.g., actions, objects and body-parts.

Comprehension - Mild difficulty is encountered in decoding single words. Retention span is limited to two items serially. Comprehension of complex ideational materials is severely impaired.

Reading - Skills of reading single words show minimal impairment. Comprehension of paragraph material is reduced to the fourth grade level. Comprehension of silently and orally read material is relatively the same.

Writing - Performance in this modality is mildly impaired. Confrontation writing, serial writing and mechanics of writing are undisturbed. However, narrative writing shows incompleteness in syntax while relevant ideas are expressed. Writing to dictation, which requires the auditory component, is impaired to the severe level.

Series Speech - Automatized sequences are produced with only minimal paraphasias.

Clinical Procedure

Examination of test data at two months post-onset revealed that written confrontation naming was 50% superior to like performance in the verbal modality. On the basis of these findings, intrasystemic reorganization (Luria, 1970) using deblocking techniques (Weigl, 1970) was attempted with this patient. Writing was used to elicit speech. Verbal expressive skills were considerably impaired. A hierarchy of deblocking techniques was designed. Visual stimulation in the form of pictures or reading material was used in all but the last stage of therapy.

Deblocking was initiated at the single word level. Therapy tasks were based on pictorial stimuli. Written naming was encouraged to precede verbal

naming of nouns and verbs. As the patient gained verbal proficiency at the single word level, phrases consisting of verb-object forms were elicited. Continuing with the principle of written production preceding the verbal, grammatical structures of noun-verbs were formed. The patient began to form noun-verb-object structures approximately three months after deblocking was initiated. Pictorial stimuli in the form of single pictures or sequence pictures were used for these tasks. After the patient successfully produced single sentences to pictorial stimuli in both graphic and verbal modalities, he was required to expand his expression. Pictures which could elicit a paragraph sequence were employed at this stage.

When intelligible sequences were produced in the majority of the patient's responses to these therapeutic tasks, pictorial stimuli were removed. However, stimulation continued via the visual channel in the form of reading material. The man read short stories or fables compatible with his reading grade level. He was required to restate the content both in writing and in speech.

Finally, all visual stimulation was removed. The patient was asked to expound on ideas or events which were both directly and indirectly related to him. Tasks centered around recollection of childhood or family events, current happenings with his associates, and interpretation of political situations. At this stage careful control was imposed over the content of the materials to be expressed by the patient. First, he was asked to relate or list happenings in his current life. Next, recollection of remote past and expression of emotions were chosen as topics. Finally, interpretation of political events and different concepts were attempted. At this level, the man is capable of only relating events; interpretative writing is currently beyond his grasp.

Linguistic Analysis

In the following part of this paper, a brief description of the linguistic features of this patient's letters is provided. Linguistic analysis of the letter data was performed in the following way. The data, consisting of 13 letters written over the period of four months post-onset, was coded according to grammatical category and syntactic phrase-type for computer manipulation. A computer dictionary of all the words according to the grammatical category and frequency was compiled. Additional listing of certain categories of special interest, such as neologisms and items crossed out by the patient, was also prepared. A complete inventory of all sentence types according to major syntactic classes was obtained.

What follows is a segment of a preliminary report on the ongoing project on the analysis of writing of the patient. Due to the time limit imposed, only certain findings of the study will be reported. Those presented below deal with the description of the patient's vocabulary according to specific grammatical category and its frequency of occurrence.

The data yielded 5500 tokens (individual occurrences of words) and 800 types (different words) with the type/token ratio of .145. The occurrence of function words as opposed to content words was 34%. The ratios of the different grammatical categories to the total number of tokens, expressed as a percentage, was as follows:

nouns 22%	auxiliary verbs 5%
verbs 11%	determiners 2%
adjectives 2%	adverbs 2%
pronouns 11%	articles 2%
prepositions 9%	other function words (conjunctions, numerals) 3%

Membership of the above classes can be characterized by the following points:

1. Nouns used were primarily picturable nouns such as book, candy, chair.
2. The class of verbs contained high frequency items such as get, like, listen, shut.
3. The class of adjectives contained a high proportion (30%) of evaluative adjectives such as nice, pretty, good.
4. Pronouns included a complete inventory of personal pronouns and subsets of possessive and reflexive pronouns.
5. Both the definite article the and indefinite articles a and an were used.
6. Determiners included thirteen different items, including this, some, any, all.
7. The class of prepositions contained 23 different items; a high proportion expressed location such as in, at; and a high proportion were occurrences of to and for.
8. Conjunctions were represented by a full set of coordinating conjunctions and, or, but, and some subordinating conjunctions such as until, unless, if, since.
9. Adverbs consisted of items such as almost, here, now, too, there.
10. Auxiliary verbs included have, be, can, will, would, may, gonna.

The data contained very few neologisms and very few misspellings.

There was a dearth of "empty" words such as thing, something, which are usually associated with Wernicke's fluent output.

Although the data revealed a complete inventory of grammatical categories, the disruption of the language structure was manifested in both wrong usage of the members within the classes and frequent omissions of the syntactically required items (e.g., the copula be). This produced paragrammatism characteristic of the disruption of language associated with posterior lesions. The errors in word usage on the whole did not violate the principle of in-class substitutions. Thus, in pronouns, he was substituted for she or they, and auxiliary verb have for be. Though occasional substitutions were made across different function word classes, e.g., determiner for pronoun, no substitutions between content words and function words were observed.

Sentence length ranged from four to twenty words with the majority of sentences consisting of seven words. A variety of sentence types was noted, with the majority being simple clauses but complex and compound sentences were also present. Paragrammatism was related to sentence length with longer sentences exhibiting more disruption of structure.

The characterization of the data according to semantic content revealed that most of the sentences dealt with description of simple events, e.g., I gotta shave and bathe now. I didn't wash hair., and that attempts at producing complex ideas or relational concepts resulted in unintelligible sequences.

Paragraphs were conventionally indicated by indenting. These units revealed a cohesive internal semantic structure, indicating that the patient had an overall plan of the message to be communicated.

In order to ascertain the patient's own judgment of acceptability of his writing, an experiment was designed which consisted of presenting him with the sentences extracted from his letters. The patient had to examine his sentences and correct them if he found them unsatisfactory. Though he readily accepted the correct ones and rejected the wrong ones, he was unable to correct them. It was interesting to note that he could understand some of the aberrant structures saying to the clinician: "They do not make sense to you, but they make sense to me".

The purpose of the above linguistic description is to emphasize both the orderliness of the rules underlying the linguistic system in the graphic modality and the relative richness of the preserved structure.

In summary, this patient's writing serves a two-fold purpose. Graphic expression supplied a link with the outside world since his home environment furnished essentially no opportunities for verbal interaction. Homework and letter writing provided a vehicle for organizing and expressing his thoughts. In communication situations outside his home, the patient was observed using writing when verbal expression difficulties arose. At the same time, speech was adopted as the sole mode of communication with those in the patient's environment who were unwilling to communicate with him by writing, or were unable to do so.

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Discussion

- Q. How about the influence of alcoholism upon his performance? Bilateral vs. the left.
- A. All PICA profiles one month post onset as well as subsequent ones clearly indicated a left side pattern.
- Q. Did you consider an implied verb vs. one that was actually present on paper?
- A. Implied verbs were not included in our analysis.

LETTERS FROM AN APHASIC: A Linguistic Interpretation

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Clinical Aphasiology Conference 1977

Excerpts from Letter

3-17-77

Dear E

I got home about 3:30. I got a steak for (melt). I was hungry, I ate a Dagwood, bowl beans & farts and Cabb. About 7:00 I took steak, some more beans, cranberry sauce & lettuce, tomato salad, I have some thousand island. It was good. I went to 9:30. I waked you 4:00. I couldn't move anymore, I got up bed 4:30.

Rain may be this afternoon. Hope I want to wear the new slipper rain coat.

Mr. M, Come in to see him. He wasn't drunk, and last night he drunk little but but look better. He was to work work at 10:00.

Well it is 9:00. I will dress & go out for ~~for~~ B house, I mail the letter. These I may letter for weekend. & let it Monday.
Hope weekend, stay well.

Clinical Tasks

Noun-Verb-Object Construction to Pictorial Stimulus

I will iron a shirt.

Paragraph Sequence to Pictorial Stimulus

Haley

The athlete is a ~~Football~~ player.
 He is dressing his. The Coach
 is in wheel chair. He has his
 Sport Coat & tie & belt. The athlete
 has his pants, coat, suit, shoes
 and boots. The has umbrella & Hat
 in closet. ~~I believe the no.~~ He is
 signed his check, the Coach.

Restatement of Content after reading "The Lion and the Mouse"

The lion was asleep for little
 mouse to stampled him
 The mouse if lion can let him
 give he will repay him in one
 a day. The mouse heard lion was
 in a net & couldn't get him for
 free. The mouse chew his ropes for
 he got free.
 The mouse "said I told you,
 I will repay you some day".

Recollection of Events from Remote Past

I lived on a farm. We found a family. ~~On~~ My mother grow lots of fig bushes. I ate lots of figs. My mother canned a lot of fig for ~~me~~ ^{my} jelly. I got all the figs, I never want any more figs. I gave a neighbor family for fig as I need to like it. May I will take figs for a friend for me. I always don't have figs for gotta. ~~the~~ Day I don't like I don't figs enough. I just kinda don't ~~like~~ like figs. I like gotta fruit like I had figs. I like peaches so better.

Interpretation of Bay of Pigs Incident

About the 15 yrs. Cuba and Corsica has felled for U.S. The Kennedy went to Cuba for U.S. until he felled for Kennedy to kill Cuba for U.S.