Anomia: A Clinical Experiment

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Anomia, or word-finding deficit, occupies a peculiar position in aphasiology. It is observed in all aphasias regardless of type, may even be a distinct aphasia syndrome, and has been extensively studied and described -- yet authors disagree about the appropriateness and effect of treating it. Wiegel-Crump and Koenigsknecht (1973) and Helmick and Wipplinger (1975) are enthusiastic about treatment as a result of their research; Brookshire's (1973) leaves him just as adamantly opposed. To expect that we are searching for a single statement -- treatment helps; treatment does not help -- may be unwise. Probably type of patient, type of aphasia, type and length of treatment, and methods and extent of baseline, progress, and criterion testing will determine what we finally come to believe. This report is intended as a contribution to the treatment controversy. The testing, treatment, progress, and retention of one anomic patient, studied using a time-series design, are described and discussed.

Case Report

The patient, a left-handed 56-year-old shipping clerk, sustained a head injury on December 5, 1975 when he fell down a flight of stairs. He was semicomatose upon admission to a private hospital near his home. Angiography revealed frontal and temporal lobe edema and a left hemisphere posterior subdural hematoma which was not operated. Sensory and motor testing were essentially normal. The patient was ambulatory but severely aphasic when he left the hospital on January 24, 1976; an EEG prior to dismissal showed a "left fronto-temporal central parietal" focus.

Initial Speech and Language Data

The patient was unresponsive when first seen by a speech pathologist on December 23. However, he improved over the next few days and his speech was then described as a mixture of meaningful and meaningless jargon. The Porch Index of Communicative Ability (PICA) (Porch, 1971) was administered approximately one month post onset, at which time his overall performance was at the 35th percentile. He was released from the hospital, received approximately five sessions of speech treatment as an outpatient, and was re-evaluated at three months duration of aphasia. His overall communicative ability had risen to the 39th percentile. He once again returned home without treatment.

The Time-Series Design

On June 7, 1976, when the patient sought treatment at the William S.

Middleton Memorial Veterans Hospital, it was decided to begin a clinical experiment using a time-series design with alternating periods of intensive, inpatient treatment and periods of no treatment during which the patient would return home. June 23 (the patient was now six months and 18 days duration of aphasia) was selected as the beginning of the first treatment period. If we count the period from June 7 until June 23 as the first no treatment period, then the patient had three treatment and five no treatment periods. Figure 1 shows the dates for each period. The no treatment periods from December 1, 1976 to January 7, 1977, and from January 7, 1977 to March 14, 1977, serve as a retention interval of four and one-half months.

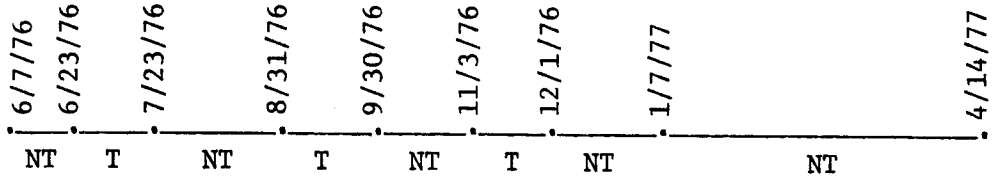

Figure 1. Order and length of the three treatment (T) periods and five no treatment (NT) periods.

Baseline Testing

Table 1 shows the baseline testing done on June 7 and June 23. On June 7, the PICA overall had slipped from the 35th percentile (seen the previous December) to the 32nd percentile. It rebounded to the 37th percentile on June 23. This score approximates the 39th percentile overall performance at three months duration of aphasia. That he quit rejecting the reading tasks and also improved on the two auditory subtests, accounts for most of the change between the two June tests. Other baseline measures included the Token Test (DeRenzi and Vignolo, 1962), the Word Fluency Measure (Borkowski, Benton, and Spreen, 1967), and the Coloured Progressive Matrices (Raven, 1962). These measures were readministered after each treatment and no treatment period. During the second treatment period, lists of treated and untreated nouns drawn from the Taylor and Marks cards (Taylor and Marks, 1959) were added as outcome measures and administered during subsequent periods in the time-series design.

As a result of baseline testing, the patient was diagnosed as having severe aphasia across all modalities without accompanying dysarthria or apraxia of speech. His spontaneous speech -- when he could be coaxed to talk -- was fluent and relevant without a significant number of literal paraphasias, but with an obvious anomic element. General speech characteristics are shown in Table 2. According to his family, he had shown almost no signs of spontaneous imporvement during the previous three and one-half months except for improved orientation and slightly improved understanding.

The Treatment

The patient received 20 hours of treatment each week during his three hospital stays. A traditional therapy approach involving primarily general auditory, reading, speaking, and writing tasks was used during the first month. It became apparent, however, that the patient's major deficit and the one of greatest personal concern was in word retrieval rather than in auditory processing, reading, or writing. Therefore, during the second and third

periods of intensive treatment, it was decided that naming practice should constitute approximately 85% of all treatment time.

TABLE 1. Baseline Evaluation Data Collected At Six Months Post Onset Prior to the Initiation of Treatment

Measure	Percentiles 6/7/76	6/23/76	6/28/76
PICA			
Overall	32	37	--
Gestural	21	28	--
Verbal	35	37	--
Graphic	50	53	--
Token Test	--	10 - 20	↓ 10
Word Fluency Measure	--	10 - 20	10 - 20
Coloured Progressive Matrices	--	30	20 - 30

TABLE 2. Speech Characteristics at the Beginning of the First Treatment Period

Speech was fluent
Syntax was essentially normal
Almost total reliance on words like "stuff", "place", and "thing"
Infrequent, unintelligible jargon
Cloze technique was ineffective
Significant latencies in repeating words
No apraxia or dysarthria

The question was, how to improve naming? Our experience and the literature (Brookshire, 1971) warned of the futility in building a treatment from repeated confrontation naming. We were equally suspicious of merely eliciting names using repetition, which may make a patient successful, but not independent of his clinician. Memorizing names was equally unattractive. A period of diagnostic testing revealed that the patient could inconsistently read what he could not name and that self-generated and clinician provided spelling cues

improved his access to his lexicon, so we finally settled upon a hierarchy of treatment tasks that began with oral spelling and writing as cues to facilitate naming. We also emphasized -- somewhat later in treatment -- self-generated associations such as "I sleep in a bed" in spite of Canter's (1973) warning that association may not help a patient produce a name and that indeed, associative responses may be symptomatic of anomia rather than a strategy for its amelioration. The treatment steps are shown in Table 3. Steps I and II were to strengthen the patient's naming ability; steps III and IV were to expand his use of these names. The continuum ends with confrontation naming -- a kind of final test. Only common nouns, including those from the Taylor and Marks cards (Taylor and Marks, 1959), were used as stimuli.

TABLE 3. Task continuum for improving naming ability

Step	Stimulus	Response
I	Picture + written word CUE: Spell orally	Patient names it Spells it orally, Writes it, Copies it, Names it
II	Picture + cloze CUE: Give first letter CUE: Spell word	Names picture
III	Picture	Patient creates sentence containing the name and function of the picture
IV	Two or more related pictures	Open-ended discussion centering on a theme
V	Picture	Names picture

Effects of Treatment

Change in overall communicative ability from June 7, 1946 to April 4, 1977, as measured by the PICA, appears in Figure 2. The patient improved, and his greatest gains occurred during periods of treatment. Moreover, he retained his compentence during the four and one-half month retention interval. Gone is the seesaw irregularity of his first four PICA's. If we examine the display (Figure 3) of the PICA overalls, nine highs, and nine lows, however, another interesting pattern emerges. A wide high-low gap, opened during the last treatment period, collapses during the retention period, betraying the fraility of certain gains. We could not convince our patient to return for another month of treatment even though the gap promised further improvement.

Specific naming ability also improved. Table 4 shows mean scores for PICA subtest, IV, a test involving confrontation naming of objects. Change was slow in coming but once it began it continued during both treatment and no treatment periods. Improvement in word fluency (Table 4) came sooner (the first increase coming after a no treatment period) but seemed somewhat less stable than confrontation naming ability.

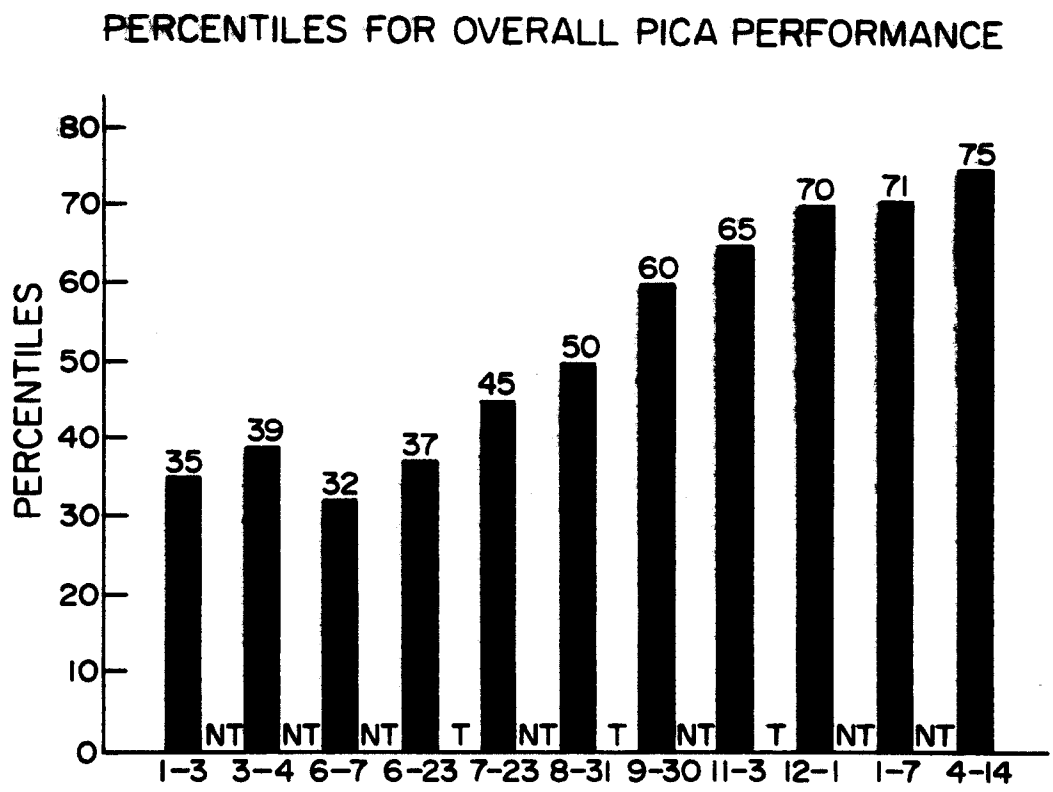

Figure 2. Change in overall PICA percentiles across periods of treatment and periods of no treatment.

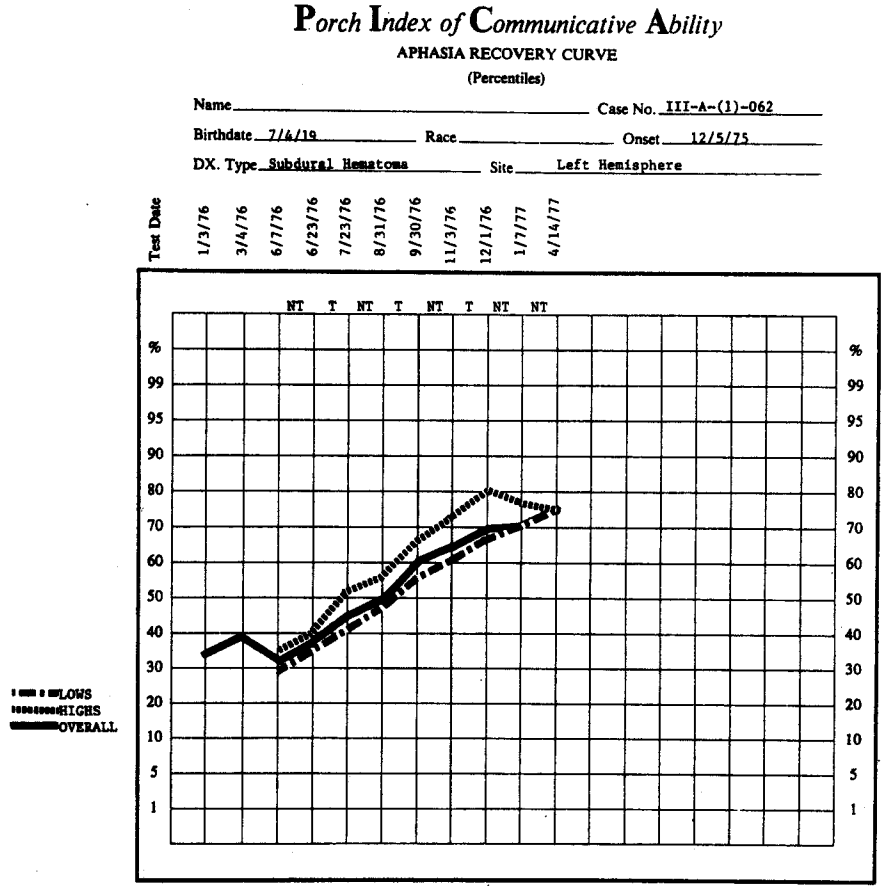

Figure 3. PICA recovery curve showing overall, nine high, and nine low performance across periods of treatment and periods of no treatment.

TABLE 4. Verbal Ability Measured by PICA Subtest IV and the Word Fluency Measure across periods of treatment and periods of no treatment

Date	Period	PICA Subtest IV Mean Score	Word Fluency Measure Number of Words
6/7/76		5.0	--
	NT		
6/23/76		5.1	0
	T		
7/23/76		6.5	0
	NT		
8/31/76		6.4	4
	T		
9/30/76		6.5	8
	NT		
11/3/76		8.3	1
	T		
12/1/76		10.1	10
	NT		
1/7/77		11.9	7
	NT		
4/14/77		11.2	7

Mean performance on a set of 30 treated nouns and 50 control nouns is shown in Figure 4, which summarized learning during the last treatment period and retention during the last two no treatment periods. The striped bars show the percent of the treated and untreated nouns that were named immediately (we choose not to use nouns the patient could not name at all), the white bars show the percent of nouns named after a delay, and the solid bars show the percent of nouns named after a clinician provided a spelling cue. Learning (greatest for the treated nouns) and generalization are obvious in the increased number of immediately correct responses and the gradual reduction in the number of cues necessary. By the end of the treatment period the percentage of nouns immediately named increased by 27% in the treated group but only 3% in the untreated group. The increase in delayed naming was 11% in the treated group and 32% in the untreated group. Untreated nouns were emerging slowly. Performance on the treated nouns was retained during the retention interval; performance on the untreated nouns increased during the retention period without practice except for their incidental appearance in daily conversation.

Discussion

More important than the fact of change in this patient, is the pattern of that change. During the initial treatment period (as might be expected because we did not concentrate on naming) and well into the second (somewhat unexpectedly because we did) his anomia was intractable, and we began to despair of our chances to improve naming. For example, he was unable to name more than one of ten objects on PICA subtest IV until November 3 -- five months after we first evaluated him. During this same period, however, his overall PICA score

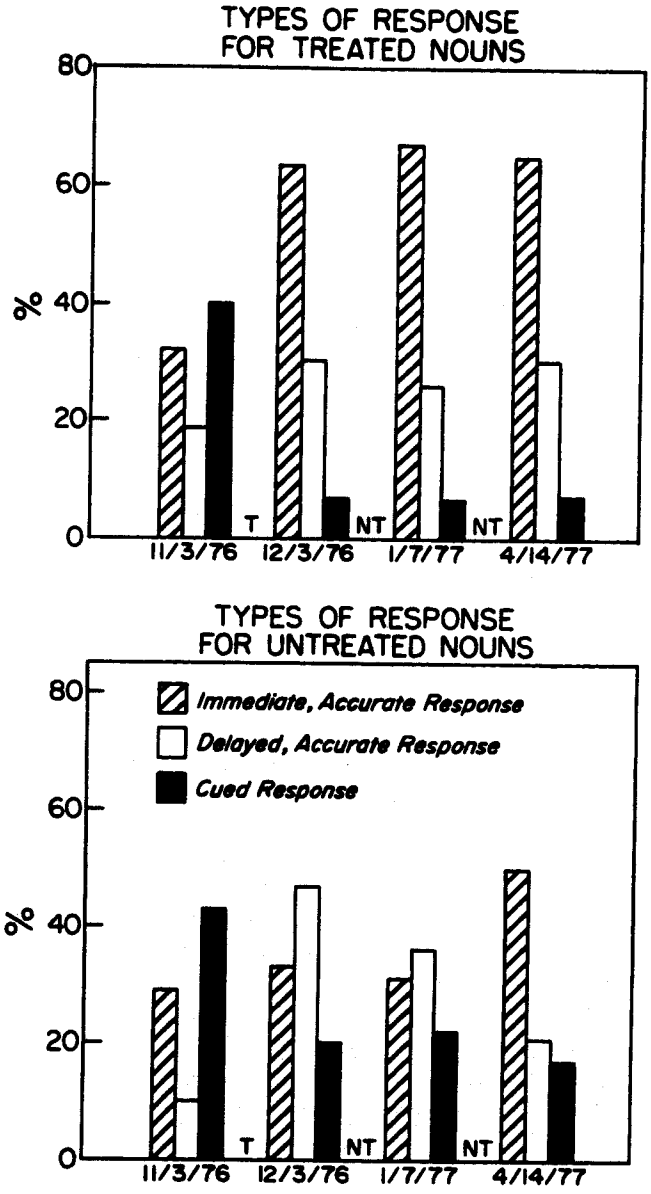

Figure 4. Types of responses for treated and untreated nouns during the last treatment period and last two no treatment periods.

had gradually increased 33 percentile points. Changes from November 3 to December 1, however, were rapid, not only in confrontation naming of treated and untreated nouns, but in spontaneous speech.

This pattern of change admits to several interpretations. Perhaps improved naming awaits some amount of change in overall communication ability -- especially in auditory comprehension. Treatment effects may be analogous to the phenomenon of summation. In one form of summation, a neuron does not fire until it has been acted upon by several other neurons. Overt activity awaits this cumulative influence. Perhaps this patient's naming ability did not change in measurable ways until his clinician had provided the cumulative effect of several hundred stimulations in several modalities.

Deserving of special study in subsequent research is the way naming change occurs. What we viewed as late, may not have been. Rather, this patient's early changes may have escaped notice. Probably, an anomic patient makes a complex series of progressive approximations on his way to naming competence that even a multidimensional scoring system may ignore.

We are less than sanguine that this patient's naming and other linguistic abilities improved because he practiced naming -- or even because he practiced anything at all. Spontaneous recovery from closed head injury may take more than six months to complete, although the proof -- beyond anecdote -- for this assertion is difficult to discover. The influence of the patient's age and handedness cannot be minimized although whether their influence is upon spontaneous recovery or recovery with treatment could be debated.

If we assume that his failure to improve on the first four PICA's coupled with his family's report that, if anything, he was worsening, is proof that spontaneous recovery fails to explain his gains, then we can more confidently blame the treatment. What we can never know at all, however, is whether our treatment worked better than some other approach -- perhaps one directed at improving auditory comprehension.

If we ascribe at least a portion of this patient's improvement to the method, then some speculation about why it worked is in order. Naming is not an all-or-none response. Both normal and aphasic speakers know something (first sound, number of syllables) about words they cannot produce. Our patient was no exception. Goodglass, Barton, and Kaplan (1968) speculate that the concept of an object is a pattern of associations contributed to by sensory information from all modalities. Presumably, as a child learns to read and write, these linguistic codes also are fed into the associational pattern. In normal speakers, any stimulus except the most distorted is usually capable of eliciting an appropriate concept and then a spoken name. The anomic's concepts are stubborn: they may not be elicited by a single stimulus, or a portion of the pattern will be elicited but not the name itself, or stimulation in one modality will evoke the concept while stimulation in another will not. The problem is not only that the anomic's access to his concepts is impaired (although that is part of it) but that the associational patterns themselves are weakened. Our systematic drill, therefore, was not merely to deblock this patient's concepts and to teach him how to deblock on his own, but also to strengthen these concepts.

We all agree that change with treatment is possible; what is worrisome is the resiliency of that change. Do aphasic patients stay improved? Our patient's retention is disturbingly uneven. The PICA overall held its own, but the high's collapsed and Word Fluency scores seemed to be degenerating. Yet, the treated nouns are stable and the untreated ones continue to improve. We have encouraged this patient to use a home program as an attempt to guarantee

retention, but he refused. He is returning to an active social and work life (although he is not employed) and only subsequent follow-up visits will tell us which of his gains are brittle and which are durable.

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