TACS: A Contrastive-language Treatment for Aphasic Adults

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There is more law written to govern what can be printed on a menu than law written to control what can be published as a test or treatment for aphasia. If a restaurateur wants to call his duck "Peking Duck," he must be able to authenticate the duck's ancestry. If one wants to market a treatment for aphasia, all one must do is find a publisher. And they abound. Few commercially available treatments for aphasia are authenicated with empirical evidence or submitted to a jury of scientific peers prior to being pushed into print.

The Texas Aphasia Contrastive-Language Series, TACS, is a name attached to a concept, some materials, and a potential treatment. It may be a good idea. The data will decide. TACS was first used with a chronic Broca's aphasic patient who had plateaued following traditional treatment (Roberts, Richardson, and Williams, 1984). This patient improved during TACS treatment, so the procedures were formalized, stimuli were created, and a manual was written to replicate the initial results (Roberts, Richardson, Quick, and Williams, 1984). The procedure was named to give it reality, and the replications began. Two of these will be presented in this paper.

TACS is designed to improve generalization of performance in treatment to spontaneous speech. It employs contrast, a familiar treatment tool with motor speech disorders (Wertz, LaPointe, and Rosenbek, 1984; Rosenbek, 1978; Rosenbek and LaPointe, 1978; Wertz, 1978). Many clinicians use contrast to facilitate word recall in aphasic patients, for example, "The car is not black, it is _____." However, to our knowledge, contrast has not been employed at the sentence level to facilitate spontaneous sentence production.

The TACS contrastive framework is designed to signify one, two, or three relevant differences between paired pictures, for example, "The door is open." vs. "The door is closed." During treatment, the patient is given the first sentence as a foundation for producing the second sentence spontaneously. The critical difference, "OPEN," is contrasted with "CLOSED" to facilitate the patient's ability to generate an appropriate response.

We have been using TACS to treat chronic aphasic patients to test its efficacy. Results of treatment with two patients follows.

METHOD

Subjects. P.G., a 64 year-old female, suffered bilateral CVAs--an old right hemisphere CVA of unknown onset and a left hemisphere CVA six months prior to TACS treatment. She was classified as demonstrating conduction aphasia on the Western Aphasia Battery (WAB). Her pretreatment Aphasia Quotient was 54.6, and she performed at the 83rd Overall percentile on the Porch Index of Communicative Ability (PICA). H.O., a 43 year-old male, suffered a single left hemisphere CVA 15 years and 5 months prior to TACS treatment. He was classified as demonstrating transcortical motor aphasia on

the WAB. His pretreatment AQ was 75.3, and he attained the 60th Overall percentile on the PICA.

Stimuli. TACS stimiuli consisted of 30 pairs of colored line drawings. Each pair differed in one to three elements within the same syntactic structure. Examples of stimulus pairs are: THE MAN IS MOPPING THE FLOOR vs. THE MEN ARE MOPPING THE FLOOR; THE BED IS MADE vs. THE BED IS NOT MADE; and THE MOUSE IS IN THE BOX vs. THE MOUSE IS ON THE BOX. Twenty pairs were used for treatment, and ten pairs were used as probes to determine generalization.

Procedure. Both patients were evaluated pre- and post treatment with the WAB and the PICA. A baseline was obtained for each patient's description of the 30 paired TACS stimuli in three sessions. Responses were scored with the PICA multidimensional scale.

Treatment consisted of a preparation phase and a three-step treatment sequence. In the preparation phase, each patient was required to select the picture in each stimulus pair that corresponded to a sentence spoken by the clinician. Next, each patient was required to select the picture in each stimulus pair that corresponded to a printed sentence presented by the clinician. The preparation phase was used to familiarize the patients with the materials and the contrastive format. Both patients reached an 80% correct criterion performance for both the auditory and printed stimuli within two presentations of each pair in each condition.

As shown in Table 1, Step 1 in the treatment sequence requires the clinician to produce a sentence describing picture A, for example, "THE DOOR IS OPEN." The patient repeats the clinician's sentence, and then the patient produces a sentence spontaneously describing picture B, for example, "THE DOOR IS CLOSED." In Step 2, the patient listens to the clinician produce a sentence describing Picture A, and then the patient produces a sentence describing Picture B. In Step 3, the patient is required to produce a sentence describing Picture A and then produce a sentence describing Picture B. After completing the 20 treatment pairs in each Step, A and B pictures are reversed, and the procedure continues with additional trials with each pair.

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Table 1. TACS treatment sequence.

STEP	SENTENCE - PICTURE A	SENTENCE - PICTURE B
	"The door is open."	"The door is closed."
I	Patient imitates clinician's production of sentence A	Patient produces sentence B spontaneously
II	Patient listens to clinician produce sentence A	Patient produces sentence B spontaneously
III	Patient produces sentence A spontaneously	Patient produces sentence B spontaneously

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Treatment continued in each step until each patient reached a mean PICA performance of "13" or better. Reliability between two judges on the PICA scoring, conducted on 20% of the data, showed 90% agreement.

RESULTS

P.G. progressed through the treatment program rapidly as shown in Figure 1. Overall prformance improved from a mean around "10" in baseline to a mean around "14" at the end of treatment. Unfortunately, the patient was discharged from the hospital before a withdrawal phase could be done. However, baseline and Step 3 performance represent the same patient behavior; that is, the patient describes both pictures without benefit of clinician modeling.
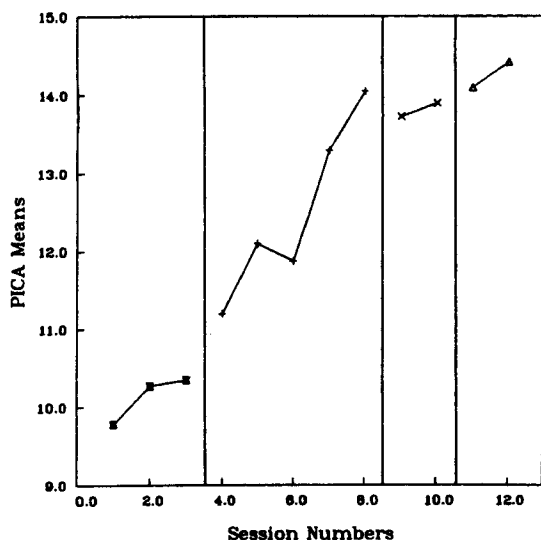

Figure 1.   Treatment - Subject P.G.

Post-treatment improvement on the WAB and PICA, shown in Table 2, indicate marked gains in P.G.,s WAB AQ and PICA Verbal percentile. Her pretreatment WAB picture description was characterized by paraphasias, inaccurate content, multiple self-corrections, and a reduction in the number of subject nouns paired with appropriate verbs. Her post-treatment picture description indicated a reduction in both paraphasias and self-corrections, improved content accuracy, and an increase in noun-verb pairing. The pre-post noun-verb pairing indicates that 82% of subject nouns were associated with a verb before treatment and 100% after treatment.

H.O.'s performance following baseline improved rapidly in six Step 1 treatment sessions (Figure 2). During withdrawal, performance deteriorated.

Performance during six Step 2 treatment sessions reached criterion immediately, but it was variable and sagged during withdrawal. Performance during Step 3 treatment was extremely erratic but above criterion in eight of nine sessions. A branching step, in which H.O. produced a sentence for picture A spontaneously and the clinician produced a sentence for picture B, was used in two sessions. Performance improved. During extended withdrawal in five sessions, performance remained at or above criterion. Overall performance improved from a mean below "11" in baseline to a mean around "13" at the end of the treatment trial. Post-treatment WAB and PICA performance

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Table 2.   P.G.'s pre- and post-treatment performance on the Western Aphasia
Battery and the Porch Index of Communicative Ability.

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            MEASURE   COMPARISON

                                        Pre-   Post-   Difference
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       WAB AQ   54.6   79.8   +25.2

       PICA

          Overall %ile   83   92   + 9

          Verbal %ile   42   62   +20

          Subtest I %ile   55   60   + 5

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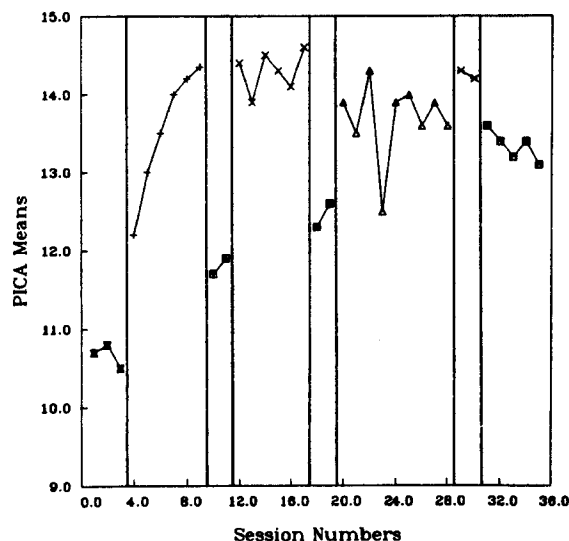

Figure 2.   Treatment - Subject H.O.

(Table 3) showed gains on all measures, particularly PICA Subtest I which
improved 15 percentile points.   H.O.'s pretreatment WAB picture description
was characterized by appropriate content but agrammatic syntax and reduced
noun-verb pairing.   The post-treatment picture description resulted in
improved syntax and improved noun-verb pairing.   The pre-post noun-verb
pairing shows an improvement from 63% to 100%.

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Table 3.   H.O.'s pre- and post-treatment performance on the Western Aphasia
Battery and the Porch Index of Communicative Ability.

MEASURE	COMPARISON		
	Pre-	Post-	Difference
WAB AQ	75.3	80.8	+ 5.5
PICA			
Overall %ile	60	64	+ 4
Verbal %ile	63	72	+ 9
Subtest I %ile	59	74	+15

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DISCUSSION

TACS treatment seemed to improve spontaneous sentence production for two chronic aphasic patients.   Both improved on the treatment stimuli, showed post-treatment gains on the WAB and PICA, and both improved spontaneous speech in the WAB picture description.   Thus, improved performance during treatment generalized to performance on other measures and in spontaneous speech.

The use of contrast, an effective method for improving intelligibility in some patients with motor speech disorders and for facilitating word retrieval in some aphasic patients, appears to influence improvement of syntax in some aphasic patients.   However, there is much to do before TACS acquires authenticity.   First, our initial results require replication with additional patients to determine the method's efficacy.   Second, we need to compare contrasting one element with contrasting two or more elements. Third, a possible hierarchy of difficulty among sentence types and lexical items must be explored.   For example, is contrasting one part of speech easier than contrasting others?   Fourth, is contrast useful as a treatment for writing, auditory comprehension, or reading deficits? Fifth, with what kind of patients is the method effective?   TACS treatment will not be appropriate for all aphasic patients.   No method we know of is.

ACKNOWLEDGMENTS

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DISCUSSION

Q: I was really excited to hear this, because I've been doing what I think is a similar thing with the Winitz Articulation Sentences. That is, there are two pictures on each card. On one side of the card, they see the sun rise; on the other they see the sun set. And, I have been saying, "They see the sun rise, now what is your picture?" and "They see the sun set," of course, is the correct response. I was wondering is that the kind of thing that you were doing, and if so, how often does the patient describe your picture?

A: The original picture?

Q: Yes, the original.

A: Well, after going through the preparation phase, we spend a lot of time emphasizing, this is my side of it, and this is your side of it. Then, once we start treatment, it's never really a problem.