Auditory Comprehension Treatment for an Aphasic Adult: A Report of Negative Findings

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Introduction

Deficits of auditory comprehension almost always occur in aphasia and the underlying causes of these deficits are difficult to understand. It is thought that attention, memory, or delays in processing are somehow intertwined with the impaired language system making it difficult to separate out their potential effects especially with auditory comprehension.

Purpose

The objective of this study was to examine the effects of an auditory comprehension treatment on auditory comprehension of directions with a participant who had chronic aphasia. This study was designed to examine treatment, generalization, and maintenance effects. The treatment was based on an approach that utilized decreasing redundancy in a hierarchy of auditory comprehension tasks. Treatment was based in part on the *Revised Token Test* (RTT; McNeil and Prescott, 1978) and used similar stimuli as the RTT.

Methods

Participant

The participant was a native-English speaker with chronic aphasia. The participant characteristics are presented in Table 1 and pre-treatment assessment results are shown in Table 2 and 3.

Table 1.
Participant Characteristics

Characteristic	Participant
Age	38
Gender	Male
Months Post-onset	23
Years of Education	12
Former Occupation	Construction
Premorbid Handedness	Right

Table 2.
Pretreatment Assessment Results

Measure	Score
Western Aphasia Battery (Kertesz, 1982)	
Aphasia Quotient (AQ)	36.9
Aphasia type	Broca's
Porch Index of Communicative Ability (Porch, 1981)	
Overall %ile	37th
Verbal %ile	37th
Auditory %ile	34th
Test of Adolescent/Adult Word Finding (German 1990)	
Total raw score - naming (107 possible)	1/107
% Comprehension	90.6%

Assessment of Intelligibility of Dysarthric Speech
(Yorkston & Beukelman, 1981)
Word level – % intelligibility 88%

Table 3.
Pre-treatment results for the Revised Token Test (Average overall performance out of 15)

Sub-Test	Score
I	10.2
II	10.1
III	8.7
IV	8.7
V	8.2
VI	8.5
VII	8.5
VIII	9.8
IX	4.2
X	10.1
Overall	8.7

Experimental Stimuli

Object stimuli.

- Treatment Levels 1 and 2: five pictured objects (ball, star, lock, cake, flag) in two colors (red and green) and two sizes (big and small)
- Treatment Levels 3 and 4: objects in the patient's everyday environment (button, cup, spoon, comb and pencil) each in two different colors (black and white) and two sizes (big and small)

Auditory stimuli.

Verbal commands were developed that involved manipulation of the experimental stimuli. The commands were devised to correspond to four treatment levels.

- Level 1: commands containing four critical elements (e.g., Touch the big star and small ball)
- Level 2: commands of six critical elements (e.g., Touch the big red star and small green ball)
- Level 3: commands of 4 critical elements utilizing everyday objects (e.g., Touch the big comb and small cup)
- Level 4: commands of 6 critical elements (e.g., Touch the big black comb and small white cup)

Experimental Design

A multiple baseline design (MBD) across contexts was chosen to examine the effects of treatment. The MBD across contexts allowed for assessment of stimulus generalization effects of treatment to different auditory command contexts and served as a potential source of experimental control.

Dependent Variable.

- The behavior of interest was the participant's performance in response to auditory commands in which he was asked to touch the experimental stimuli in prescribed orders.
- Responses were considered to be correct if all elements in the stimuli were executed accurately.

Baseline Phase.

- Baseline probes were conducted on three separate occasions for each level of treatment.
- Fifteen items were administered for each level.
    - Ten of the items were designated as treatment stimuli (to assess acquisition effects).
    - Other five items were designated as non treatment items (to assess response generalization effects).
    - Items within each level were randomly presented.
- The participant was presented with the auditory stimuli one time by the clinician via audio tape.

Treatment Phase.

- Following baseline probes, treatment was applied sequentially to each phase, beginning with pictured items with 4 critical elements.
- Probes were conducted at the beginning of each session prior to treatment.

- Probes were conducted every other session for the level currently undergoing treatment.
- Probes were continued and conducted every third session for untreated levels.
- Treatment was conducted three times per week.
- A treatment session consisted of one trial of 10 items for each sub-phase of each treatment level.
- Treatment was conducted for each level until 80% accuracy was achieved over two consecutive probes sessions or until 20 treatment session were conducted for a particular level of treatment.

Maintenance phase.

- After treatment was terminated for a specific treatment level that level was continually measured.
- Maintenance probes were conducted for previously treated levels every 2 to 3 sessions.

Treatment

- Level 1: auditory stimuli at this level contained four critical elements with pictured objects presented twice initially and presented once for final phase of treatment.

- Level 2: stimuli comprised of six critical elements with pictured objects presented twice initially and once in the final phase of treatment.
- Level 3: auditory stimuli contained four critical elements with everyday objects presented twice initially and presented once for final phase of treatment.
- Level 4: stimuli comprised of six critical elements with everyday objects presented twice initially and once in the final phase of treatment.
- During each treatment session, auditory stimuli were presented via live voice by the clinician.
- The clinician presented auditory stimuli twice with a five to ten second pause taken.
- The participant had 45 seconds to respond and feedback was given according regarding the participant's performance.
- If an incorrect response occurred then the steps of the treatment hierarchy were followed.

Results

Figure 1. Percentage of correct responses in probes by the participant. Each graph depicts responses at each treatment level.

Discussion

These findings indicate that this treatment did not facilitate improvement in auditory comprehension as measured by ability to follow commands. Repeated exposure to the

task and stimuli apparently had no impact either. Gains were apparent during treatment sessions, but weren't reflected in probes. An analysis of probe data using scoring of critical elements as opposed to binary scoring system also did not reveal changes in probe performance.

Acknowledgement

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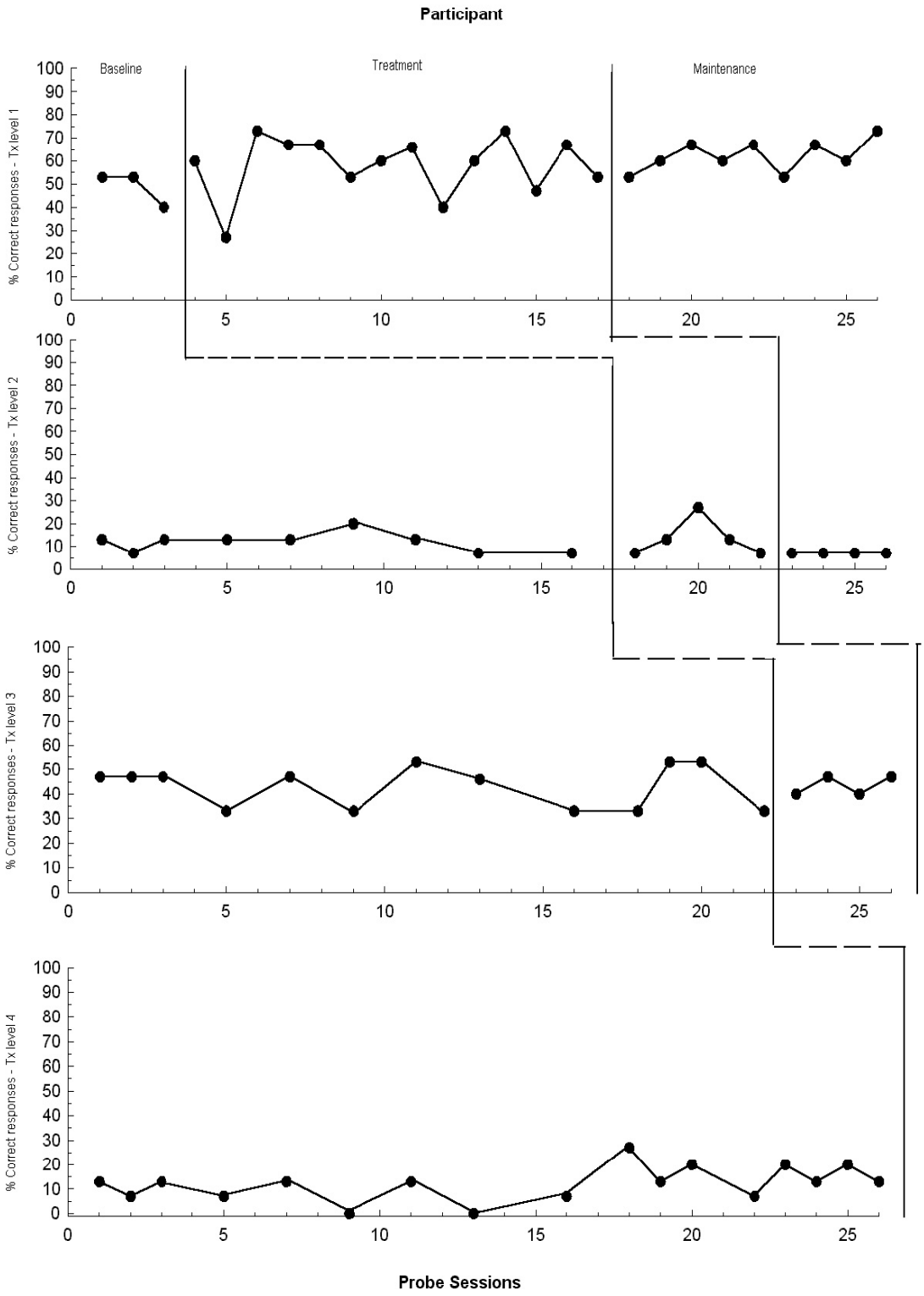
Participant
Baseline
Treatment
Maintenance
% Correct responses - Tx level 1
% Correct responses - Tx level 2
% Correct responses - Tx level 3
% Correct responses - Tx level 4
Probe Sessions