

## Efficacy of a Hierarchical Treatment of Aphasic Perseveration (TAP) Program: A Case Study

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### ABSTRACT

This paper explored the effectiveness of a hierarchical Treatment of Aphasic Perseveration (TAP) program on an aphasic in two regards: decrease in the frequency of perseveration and improvement in naming ability. The subject was a 54-year-old female with Transcortical Sensory (TCS) aphasia following a left ischemic Cerebrovascular Accident (CVA).

It was concluded that the hierarchical TAP program was more effective and efficient in terms of decreasing perseveration and increasing correct naming performance. Within the data of the hierarchical TAP program, however, a substantial decrease in the frequency of occurrence of perseverative behaviors did not necessarily result in proportionate improvement of naming ability. The probable causes and reasons were discussed.

**Keywords:** Hierarchical TAP (Treatment of Aphasic Perseveration), transcortical sensory aphasia, perseveration

### 1. Introduction

Perseveration is involuntary an continuation of a previous response. It is a common phenomenon that most aphasics manifest and it often interferes with appropriate language performance.

In a clinical setting, perseveration can be managed by directing the patient's attention to something else rather than the target item that he/she is dealing with. For example, when the patient is repeating the previous word rather than a new target word in a naming task, clinician can comment on or ask about today's weather and back up for a moment from the task at hand, planning to go back to the target word later. Sometimes this directs the patient's attention to a totally different thing and aids in stopping the perseveration. This is a more behavioral approach than a linguistic intervention.

In addition, it may help to provide a dissimilar context between the adjacent utter-

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ances, such as differing the number of syllables of the adjacent words or using different melodic patterns among adjacent utterances (Jeong, 1994; Ko & Jeong, 1998; and 정옥란, 1999). It may also be helpful to provide assistive stimulation with high stimulability in eliciting target words. In other words, when the patient repeatedly produces the former word "pencil," for example, instead of a new target word "apple," the clinician can provide the patient with tactile stimulation (having him/her touch an apple) or olfactory stimulation (having him/her smell an apple). Olfactory stimulation appears to show a high level of stimulability even in relatively severe aphasics (Jeong & Lee, 2000), even though it has not been investigated how effective it is specifically in the intervention of perseveration yet.

In fact, intervention programs for perseveration, per se, are very limited, although perseveration is one of the major culprits for lowered language performance in aphasic patients. The above mentioned techniques are rooted in logical speculation and clinical impressions. However, systematic investigation is most needed in order to implement a specific technique on a routine basis in the treatment of perseveration, which would, in turn, enhance aphasic's language recovery.

Helm-Estabrooks et al. (1987) developed the TAP program. It is more focused on the direct treatment of perseverative behaviors than linguistic errors in the patient's response. It has not been recognized as a highly employed therapy technique, especially in Korea. Therefore, the present study attempted an investigation to determine the effectiveness of the therapy program in a Korean aphasic. However, some changes were needed due to the linguistic difference and speech characteristics of the subject.

## 2. Methods

### 2.1 Case History

KK was a 54-year-old, right-handed female who was a full-time housewife. She exhibited a moderate to severe TCS following a left hemisphere infarction in 1999. Her MRI showed a relatively large lesion in the temporo-parietal lobe in the left hemisphere. She participated in the experiment 14 months post onset. She still complained about numbness in the right half of her body especially her right hand. She showed a few behavioral signs that indicated a problem with hearing acuity. However, it was proved that her hearing sensitivity was normal and her attentional deficit caused pseudo-hearing problems. Her visual acuity was normal without any form of correction. Her olfactory perception seemed to be intact as well. A stroboscopic examination evidenced no signs of vocal folds paralysis. She was cooperative in general, but her mood swings and depression were prominent on some days. She was not previously exposed to any form of speech or language therapy prior to the experiment.

## 2.2 Communicative Skills

According to her spouse, she used to be a very pleasant and talkative person. However, after the CVA, she became very reluctant to communicate via verbal language. She became angry very easily when her family members did not understand her speech. Her emotional lability was not very severe. However, her language performance fluctuated noticeably when depressed. She showed 30% correct response in receptive language and 35.3% in expressive language on the Taegu Diagnostic Test for Aphasia (1993, 정옥란). She performed poorly in naming tasks and did not elicit any propositional language spontaneously. Her reading, writing, and body language performance was very poor. Her repetition skills and automatic speech, however, were relatively good.

She showed 60% of a perseveration score and 5% of a visual confrontation naming score in the baseline measurements. The perseveration score was calculated as follows; the number of items in which she showed perseverative behaviors at least one time when the stimuli were presented was divided by the total number of item and converted into a percentage score. The naming score was calculated as follows; the number of items that she verbally named correctly within 10 seconds of the presentation of stimulus picture cards was divided by the total number of items and converted into a percentage score. The stimulus was presented only once, in spite of the patient's request, and no feedback was given during evaluation throughout the entire experiment. Dysarthric production of words did not count as an incorrect response as long as the utterance was understandable.

## 2.3 Treatment Protocol

### 2.3.1 TAP Program

The original TAP program consisted of 13 specific strategies. They included 1) Time interval, 2) Oral reading, 3) Repetition, 4) Descriptive sentences, 5) Sentence completion, 6) Phonemic cue, 7) Gestural cue, 8) Drawing, 9) Singing, 10) Tactile cue, 11) Unison speech, 12) Melodic intonation, and 13) Copy. The developers of the program recommended that the clinician determine the number and combination of strategies to be used, based on the patient's overall performance on the diagnostic test. The present study did not use the original TAP program but made some modifications to make it applicable to the Korean language and effective for the subject. It was named the Hierarchical TAP Program.

### 2.3.2 Hierarchical TAP Program Procedures

The Hierarchical TAP program did not provide combinations of strategies. Instead, after making a diagnosis, the experimenters selected and/or modified six specific strategies which were most effective in eliciting non-perseverative response. The alteration and/or modification was a result of linguistic differences between English and Korean and the nature of the subject's language performance.

The six strategies included 1) Time interval, 2) Descriptive sentences (explain stimulus verbally), 3) Syllable cue (provide the first syllable of target word), 4) Gestural cue (show pantomime or body language related to target word), 5) Tactile cue (have the subject touch the object and/or manipulate it), and 6) Melodic intonation (Tap the subject's left hand for each syllable and ask her to intone the target word with the clinician). Strategy 1) Time interval was used each and every time, and Strategies from 2) to 6) were utilized in a hierarchical manner.

Namely, a 5-second time interval was imposed between the presentation of the stimulus and her verbal response to each item. The stimulus was first presented via Strategy 2) Descriptive sentences. If the subject did not show any response for 10 seconds or the response was incorrect, Strategy 3) Syllable cue was introduced. Again, if the subject showed inappropriate response or no response for 10 seconds, Strategy 4) Gestural cue was introduced and so on. Each time Strategy 1) Time interval was used to improve 'reflective thinking' or 'reflective listening' skills which might inhibit impulsive perseverative verbal responses. Therefore, the hierarchical portions of the treatment protocol were, in fact, Strategy 2) through 6), which meant the hierarchical TAP had only five levels not 6 levels, although the number of specific strategies employed was six.

#### **2.4 Experiment Procedures**

The Hierarchical TAP therapy program took place every 2 days. Completion of the therapy program required 30 minutes for each therapy session. The total number of sessions was 20 and the entire experiment lasted for 45 days. The percentage scores of correct naming response and the frequency of occurrence of perseveration were evaluated using 20 untreated items every 5 sessions.

### **3. Results**

The entire experiment consisted of 20 treatment sessions during one and a half months time period. The data were examined in two different ways. The first set of data used perseveration scores and the second, verbal naming scores. The evaluation took place every 5 sessions. The results are presented in Table 1. The average scores were calculated using only the data of the treatment sessions (excluding the baseline measurement scores).

Table 1. Treatment Effects of the Hierarchical TAP

Session No	Baseline	5	10	15	20	Average
Perseveration	60	30	25	20	10	23.8
Naming	5	5	15	15	30	16.3

Upon completion of the experiment, the Taegu Diagnostic Test for Aphasia was administered again in order to compare pre- and post- therapy effects. In general, both receptive and expressive language performances were improved. However, the magnitude of improvement was not very great, with the exception of two categories: spontaneous speech and gestural language. The spontaneous speech improved from 0% to 33%, and the gestural language from 33% to 67%. Table 2 shows the percentage of correct performance on the Taegu Diagnostic Test for Aphasia in detail before and after treatment.

Table 2. Taegu Diagnostic Test for Aphasia Results

Linguistic Category		Pre-therapy	Post-therapy
Receptive Language	Auditory Comprehension	31	36
	Visual Comprehension	29	39
	Tactile Recognition	40	50
	Olfactory Recognition	50	50
	Spacial Relations, L-R Differentiation, Color Recognition	0	13
	Average	30.0	37.6
Expressive Language	Word Retrieval	28	40
	Automatic Speech	88	88
	Repetition Skills	87	87
	Spontaneous Speech	0	33
	Reading	0	0
	Writing	11	26
	Gesture	33	67
	Average	35.3	48.7

#### 4. Conclusions

Visual inspection of the data showed a general tendency to decrease perseveration scores and increase correct naming scores. The entire treatment lasted only one and a half months and the patient showed noticeable improvement. Thus, it can be said that the Hierarchical TAP program was not only effective but efficient, although it would be necessary to compare the results produced by other therapy techniques in a later study.

However, when the most decrease of perseveration did not show the most increase in the naming performance. Probable reasons and some assumptions are suggested in the discussion.

In addition, her spontaneous speech and gestural language improved remarkably, although they were not treated at all and were not the major objectives of the treatment.

## 5. Discussion

The subject of the present study had a left temporo-parietal lesion and showed predominantly recurrent perseverations. This is in agreement with Sandson and Albert's study (1987). According to their perseveration classification system (recurrent, stuck-in-set, and continuous perseveration; Sandson & Albert, 1984), recurrent perseveration is related to left temporo-parietal damage.

Strategy 1) Time interval appeared to be effective in improving her attentional deficit. It was our clinical impression that the time interval strategy aided in inhibiting her impulsive and/or involuntary perseveration and helped her practice reflective thinking and listening. As a result, she seemed to become calmer and increase her ability to self-monitor her verbal performance.

Even though it might be natural to expect the highest improvement in the naming task to correspond with the steepest decrease in perseveration, this was not true. For example, the subject showed the most marked decrease in perseveration from 60% to 30% in the 5th session as compared to the previous evaluation (baseline). And yet, her naming score stayed the same with 5% accuracy. Instead, the greatest improvement in naming took place in the 20th session where the perseveration scores decreased by only 10%: from 20% to 10%. We had to leave this problem to a future investigation. However, some speculation was made and we hope to shed greater light in a further investigation of the TAP program in terms of the scoring system and subject selection criteria.

First, only a TCS patient with moderate to severe perseveration, such as this subject, may follow the course of recovery that the results show in this study. Administering the Hierarchical TAP to aphasics of varying type and severity is necessary in order to address this point.

Second, perseveration may be controlled faster and more directly via TAP but it takes more time for the improvement to be manifested in more difficult tasks, such as visual confrontation naming. In that respect, a more sensitive scoring system in naming may be necessary. The simple dichotomy of correct or incorrect response employed in the present study is not sensitive enough to delineate a subtle linguistic improvement. Measuring response latency, for instance, may be one idea. It tells something different if the patient

responds promptly, or hesitantly, or with stuttering, or after a long latency, regardless of correct or incorrect response. By the same token, the scoring system for perseveration can be reviewed since it can occur impulsively (immediately), several times in a row, or laboriously and after a long latency.

Finally, we recommend a future comparative study using the Hierarchical TAP program and other therapy techniques simultaneously in order to determine the effectiveness and efficiency of the current therapy program and advocate its use on a routine basis in a clinical setting for Korean aphasics.

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