

An Analysis of Learning, Generalization  
and Maintenance of Verbs by an Aphasic Patient

Thomas E. Prescott  
Veterans Administration Medical Center, Denver, Colorado

Marilyn Selinger  
Metropolitan State College, Denver, Colorado

Felice L. Loverso  
Veterans Administration Medical  
Center and Medical College of Georgia, Augusta, Georgia

The ultimate goal of treatment with aphasic patients is generalization of learned language behaviors to similar classes of language and the maintenance of these behaviors over time. Thompson and Kearns (1981) concerned themselves with examining generalization and maintenance in an anomic aphasic patient. Using a multiple baseline design, they sequentially trained two sets of semantically paired lists of nouns. Basing their treatment on previously reported success with cueing hierarchies, their cueing consisted of sentence completion, sentence completion plus a phonetic cue, and sentence completion with a verbal model. Their findings indicated that the cueing hierarchies were effective tools for facilitation of naming behavior and that the naming behaviors were maintained for the several months over which they were retested. However, generalization of naming behavior was not seen from one list to its pair. Thompson and Kearns (1981) stated that their data did not lend support to the idea that such treatment improves the retrieval process.

Accessing the lexicon in aphasia treatment is a primary goal. Loverso, Selinger and Prescott (1979) reported success in aphasic persons' acquisition and maintenance of communicative abilities following a program using cueing hierarchies based on the verb. Systems based on the verb center all language procedures around the action: (1) the individual who carries out the action is the actor, and (2) the person or thing affected by the action is the object. According to Bever (1970), definition of the constituent elements into the actor-action-object form guides the procedure by which we perceptually segment sentence units or tap the internal structure of language. In other words, language stimulation using the verb may be the most direct and useful way to facilitate the retrieval process. (For a complete review see Loverso, *et al.*, 1979.) Facilitating verb production is believed to access the actual internal structure of language (the actor-action-object form). Generalization was not examined by Loverso, Selinger and Prescott as was done in the work by Thompson and Kearns.

The purpose of the present study was (1) to investigate the effects of the verb centered treatment approach previously described on generalization of communicative ability, (2) to reexamine the applicability of the "verb-as-core" model to aphasia treatment, and (3) to reexamine maintenance of the behaviors learned in treatment following treatment.

## METHOD

The subject was a 53-year-old male who had suffered a left posterior temporoparietal hemorrhage in August, 1977. The patient was evaluated for speech and language function in July, 1981. He had received no prior evaluation or treatment. The Porch Index of Communicative Ability (PICA) (Porch, 1967) indicated the following performance levels: Overall=54%ile, Gestural=29%ile, Verbal=61%ile, and Graphic=65%ile. Three months after evaluation the patient began group treatment. A second PICA was administered at that time, indicating the following results: Overall=57%ile, Gestural=29%ile, Verbal=64%ile, and Graphic=76%ile. Based upon these two tests the patient was considered to be stable and the verb based program was initiated.

The treatment task involved Level I of the verb centered treatment reported by Loverso, Selinger and Prescott (1979). Level I was used because that study indicated the most pronounced effects following Level I. The Level I task requires that a patient compose a simple sentence of noun plus verb from an auditory and visual input of the verb. The patient is then cued with "who" or "what" questions. Response modalities are both graphic and verbal.

Visual stimuli included 40 verbs on 4 x 6 cards and 2 cue cards, one with "who" on it, the other containing "what." Verbs were obtained from Thorndike and Lorge (1944) word lists 400A and 400B to control for frequency of occurrence. Verbs were divided into four lists of 10 verbs. An equal number of verbs from lists 400 A and B occurred in each of the four verb lists.

Using a multiple baseline design similar to that described by Thompson and Kearns, baseline, treatment, and post-testing occurred sequentially as follows. The first four sessions were baseline sessions. Actor-action performance was tested for all four lists. No cueing or feedback was given at this time. Following the first four baseline sessions we continued to assess lists two through four as baseline behaviors while list one was trained using the verbing program. Cueing and verbal feedback were used as described in Level I. Criterion for the verb lists was set at 90% or 20 sessions for the combined (average) verbal and graphic output. Following establishment of criterion behavior, the design called for baseline scores to be obtained on lists three and four and list two to be trained as above. Next, only list four was to be baselined and list three trained. Last, only list four was to be trained. Maintenance testing began two months after the completion of each list using the baseline format.

The treatment program was administered to the patient as described above. Both the graphic and verbal output for each verb was scored. This scoring system was liberally adapted from Porch (1967).

Criterion scores were PICA 13, 14 or 15. Any score falling beyond the criterion range was considered incorrect for purposes of this study. Scores were tallied for each session and the percent correct computed.

## RESULTS

The following results were obtained. Initially, four baseline measures were obtained for each of the four verb lists. The patient was presented with a verb and a "wh" question and asked to produce a subject and an action

both verbally and graphically. No feedback was given to the patient regarding his performance and both the verbal and graphic performances were scored and recorded. Table 1 depicts these baseline performances in percent correct for each of the verb lists for the verbal output scores, Table 2 the graphic output scores, and Table 3 the combined (verbal and graphic mean) scores.

The initial verbing treatment session was conducted for Verb List I on 12-16-81. Criterion for learning each list was set at 90% success for the averaged verbal and graphic scores. Following completion of training on List I our patient achieved 90% accuracy for the verbal portion of Verb List I and 70% for the graphic portion. The average of 80% did not reach the previously specified 90% criterion level. The combined score following training on List I did, however, demonstrate improvement from baseline for all lists studied. The 80% combined level represented 35% improvement following one training session on Verb List I and 27.5, 22.5 and 37.5% improvement for the nontrained Lists II, III and IV respectively. Following training session one, our subject reached the 90% level for the verbal portion of the task and the 70% level for the graphic portion. The verbal score represented 40% improvement from the average baseline for Verb List I, 32.5% improvement for List II, 35% for List III, and 17.5 for List IV. The obtained Graphic score (70%) represented 34.5% improvement from average baseline for List I, 22.5% for List II, and 12.5% and 27.5% for Lists III and IV respectively.

Five days later a second training session was conducted utilizing the verbs from List I. An average verbal and graphic score indicated that criterion had been reached (score 90%). The verbal score was 100% while the graphic score was 80%. Increases from baseline following training session two were similar to those obtained following training session number one.

Two days following completion of the training on Verb List I, training on Verb List II was initiated. The patient reached criterion following this session with 100% accuracy for both verbal and graphic scores. Testing of Lists III and IV indicated verbal improvement from baseline of 35% (45-80), and 17.5% (62.5-80) respectively. Graphically performance improved from baseline for List III by 7.5% (52.5-60) and for List IV by 17.5% (42.5-60). The combined scores reflect improvement for untrained Lists III and IV of 12.5% (57.5-70.0) and 27.5% (42.5-70.0) respectively.

Upon completion of three training sessions (two on List I and one on List II) our subject had improved his verbal scores from baseline for the untrained lists III and IV by an average of 26.5%. Completion of treatment session three on Verb List III was accomplished 12 days after training on List II. Following one treatment session for List III the patient achieved 100% accuracy both verbally and graphically. Testing on List IV resulted in a verbal score of 100% accuracy and a graphic score of 80%. Since this combined score was at the 90% level, Verb List IV was not trained.

Following approximately a two-month period of group treatment only, an average of two post testing sessions on the verb lists indicated that verbal gains were maintained for Lists I, II, and III with a slight drop of 5% (100-95) noted on List IV (Table 4). Graphically, trained levels were exceeded for Lists I and IV and a slight drop (100-90%) was noted for Lists II and III. Improvement from baseline of approximately 40% was noted. Scores for the combined verbal and graphic scores indicated maintenance of criterion (90%) for all four verb lists studied.

Table 1. Percent correct verbal baseline scores across verb lists.

Baseline	I	II	III	IV	$\bar{X}$
List					
1	50	60	40	60	52.5
2	50	60	50	70	57.5
3	60	60	60	70	62.5
4	<u>40</u>	<u>50</u>	<u>30</u>	<u>50</u>	42.5
$\bar{X}$	50	57.5	45	62.5	

Table 2. Percent correct graphic baseline scores across verb lists.

Baseline	I	II	III	IV	$\bar{X}$
List					
1	30	30	60	20	35
2	40	60	60	50	52
3	40	50	40	50	45
4	<u>40</u>	<u>50</u>	<u>50</u>	<u>50</u>	47
$\bar{X}$	37.5	47.5	52.5	42.5	

Table 3. Percent correct combined verbal and graphic scores across verb lists.

Baseline	I	II	III	IV	$\bar{X}$
List					
1	40	40	60	30	42.5
2	50	60	60	50	55
3	40	50	50	40	45
4	<u>50</u>	<u>60</u>	<u>60</u>	<u>50</u>	55
$\bar{X}$	45	52.5	57.5	42.5	

Table 4. Mean post test percent correct across verb lists.

List	I		II		III		IV	
	Verbal	Graphic	Verbal	Graphic	Verbal	Graphic	Verbal	Graphic
	100	90	100	90	100	100	95	90
	Combined		Combined		Combined		Combined	
	95		95		100		95.2	

## CONCLUSION

In conclusion, these results suggest that treatment of aphasic patients utilizing the verbing approach previously described by Loverso, et al. (1979) is efficient in that learning of the verbs trained generalized to verbs not trained. This was not the case, as reported by Thompson and Kearns (1981), for noun learning. The observed maintenance of this learning over time suggests that treatment of aphasic patients utilizing the "verb as core" model is an efficient and effective treatment approach. However, continuing study with larger numbers of subjects is needed.

## REFERENCES

- Loverso, F.L., Selinger, M. and Prescott, T.E. Applications of verbing strategies to aphasic treatment. In R.H. Brookshire (Ed.), Clinical Aphasiology: Conference Proceedings, 1979. Minneapolis, MN: BRK Publishers, 1979.
- Porch, B.E. Porch Index of Communicative Abilities. Palo Alto, CA: Consulting Psychologists Press, 1967.
- Thompson, C.K. and Kearns, K.P. An experimental analysis of acquisition generalization, and maintenance of naming behavior in a patient with anomia. In R.H. Brookshire (Ed.), Clinical Aphasiology: Conference Proceedings, 1981. Minneapolis, MN: BRK Publishers, 1981.
- Thorndike, E.L. and Lorge, I. Teachers Word Book of 30,000 Words. New York, NY: Teachers College, Bureau of Publications, Columbia University, 1944.

## DISCUSSION

- Q: Why do you think generalization happens with verbs and not with nouns.
- A: We of course think it relates to the linguistic nature of verbs. Our paper two years ago pointed out why verbs may be superior to nouns for teaching strategies to aphasic patients.