CHAPTER

18

The Efficacy of Treatment for Two Globally Aphasic Adults Using Visual Action Therapy

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Global aphasia has been defined, in part, as a severe, acquired impairment of communication across all language modalities with no single communicative ability being strikingly better than any other (Collins, 1986). Presumably owing to their extensive deficits, globally aphasic individuals have been resistant to traditional therapeutic approaches (Sarno, Silverman, and Sands, 1970; Schuell, Jenkins, and Jimenez-Pabon, 1964). Based on these reports and shared clinical experience, alternative intervention techniques for the rehabilitation of globally aphasic patients have begun to receive attention (Gardner et al., 1976; Glass, Gazzaniga, and Premack, 1973; Moody, 1982; Towey and Pettit, 1980). Visual action therapy (VAT) (Helm-Estabrooks, Fitzpatrick, and Barresi, 1982) is one such technique that was designed to train globally aphasic patients to produce symbolic gestures for visually absent stimuli.

Helm-Estabrooks, Fitzpatrick, and Barresi (1982) investigated the effects of VAT on the communicative abilities of eight globally aphasic adults. A comparison of pretreatment and post-treatment scores on the Porch Index of Communicative Ability (PICA) (Porch, 1981) was used to assess the efficacy of VAT. However, the data from the Helm-Estabrooks, Fitzpatrick, and Barresi study remain uninterpretable due to the inherent sources that threaten the validity of a pretest-posttest experimental design (Campbell and Stanley, 1963) that were uncontrolled and unaccounted for in their investigation.

Because the efficacy of VAT remains essentially untested, the present study was designed to investigate the effects of VAT on the communication skills of two globally aphasic patients. Three questions were asked:

1. Is there a treatment effect attributable to VAT in the subject's performance on VAT trained tasks compared to baselined but untrained tasks?
2. Is there evidence of generalization of learned VAT behaviors to other lists within and across program steps?
3. Is there evidence of maintenance of the learned VAT behaviors?

METHODS AND PROCEDURES

SUBJECTS

Two adult males, ages 66 (subject A) and 81 (subject B), voluntarily participated in the investigation. Both had normal intellectual development

and were premoridly right-handed. Each had a global aphasia secondary to a left-hemisphere CVA and were 12 and 16 months postonset, respectively. Pretreatment overall PICA scores were 4.70 and 6.72 for subjects A and B, respectively. Both subjects had received general language stimulation therapy prior to this investigation. However, neither subject had any previous exposure to VAT.

TREATMENT PROGRAM

VAT is a nonvocal gestural output program that was developed as a precursor to formal language training. The objective of VAT is first to train the symbolic representation of line drawings and gestures so as to be able to pantomime the associated symbolic gestures. The treatment program utilizes objects whose function can be represented with a distinct unilateral gesture and three sets of picture cards: large (5 by 8 inches) isolated colored pictures, small (1½ by 3 inches) isolated colored pictures, and action cards (3 by 5 inches) that depict a shadow figure appropriately manipulating the object. The program is organized into a series of 30 steps divided into three levels. The subject's response at each step varies from matching pictures with objects, to manipulating the objects, to pantomiming their function. All instructions and reinforcement are presented nonvocally. Each step is detailed in Helm-Estabrooks, Fitzpatrick, and Barresi (1982).

Three modifications in the procedures outlined by Helm-Estabrooks, Fitzpatrick, and Barresi (1982) were made. First, in order to maintain experimental control across lists, items that presented persistent difficulty for the patient were not substituted with another object. Because of this alteration, the criteria for advancement to the next step were modified: Seven of eight correct in two of three consecutive trials rather than eight of eight correct in one trial set as used by Helm-Estabrooks, Fitzpatrick, and Barresi (1982). Finally, a plus-minus scoring system replaced the 0-point (incorrect), ½-point (self-correct), and 1-point (correct) system because the ordinality and intervality of this system had not been established.

STIMULI

The stimuli included the original 8 VAT items and 16 items selected from the New England Pantomime Tests (Duffy and Duffy, 1984) whose function could be demonstrated unilaterally. The stimuli were randomly distributed within three 8-item lists (list 1: balloon, car cup, eraser, hat,

needle, salt, and saw; list 2: apple, book, door, hammer, ice cream cone, iron, screwdriver, and stamp; list 3: ball, drum, gun, handkerchief, razor, spoon, teapot and telephone). Additional objects used as contextual prompts in level I, steps 4 to 6 included a chalkboard (eraser), a piece of wood with a protruding nail (hammer), a piece of cloth (needle), a partially cut piece of wood (saw), and an envelope (stamp).

EXPERIMENTAL DESIGN

Two separate single-subject experimental designs, obtaining multiple probes across behaviors with changing criteria, were utilized to investigate the treatment effects of VAT. In this design, VAT was applied to one list of stimuli, while baseline data were taken on the remaining two control lists. In addition, the PICA was administered in a pretest-posttest manner to assess extended generalization. The rationale for using the PICA in this otherwise inadequate pretest-posttest design was based on the premise that if stable baselines could be established for the experimental tasks, it would be reasonable to assume a stable PICA performance without baseline stability evidence.

BASELINE DATA

Prior to the first treatment session, pretreatment baselines were collected across all lists for level I, steps 1 to 6. Because of the extensive amount of steps in the VAT program, the remaining steps requiring pretreatment baseline data were collected as the treatment began on list 1. While this presents a possible source of baseline contamination, it was judged to be the most viable solution to obtain necessary pretreatment baselines on all the steps to be treated.

TREATMENT SCHEDULE

Both subjects participated in thirty 55-minute treatment sessions over a 7-week period. The time span between sessions ranged from 1 to 3 days. During each session, baseline data were gathered prior to treatment data. The treatment portion of the session began with training on the previous step in which criterion was achieved.

RELIABILITY

Intrajudge reliability was assessed on five different occasions for each subject. Entire sessions were videotaped periodically during the initial baseline sessions and throughout the treatment. Point-to-point intrajudge reliability for the correct/incorrect response judgments was determined by a second scoring of each of the videotaped sessions. Overall point-to-point agreement for the total behaviors scored for each subject was 97 percent (528 total behaviors) for subject A and 99 percent (352 total behaviors) for subject B.

RESULTS

The data from each step or substep that received treatment were graphically displayed for visual analysis. Because all the matrices from which judgments were made cannot be presented, Figure 18-1 was chosen to illustrate the general results of the study.* Each matrix illustrates the subject's performance on all three lists at a particular step. The vertical line signifies the initiation of treatment for that step. Although the symbol for list 1 changes at each phase (baseline, treatment, and maintenance), the list 1 stimuli remained constant. The 27 graphs were visually analyzed independently by two judges to determine the presence or absence of treatment, generalization, and maintenance effects. Criteria for presence of effects was agreement between the two judges.

Figure 18-1 contains the performance data for subject A on level I, steps 4 to 8. Note that there are no data for step 7 because this step does not require an overt response from the subject. In the steps illustrated, the treatment effect is demonstrated on steps 4, 5, 6, and 8. Generalization was judged not to have occurred. Maintenance of the learned behavior was judged to have occurred on all steps in this figure.

Overall, the judges determined that a positive treatment effect was demonstrated for 12 of 14 and 6 of 13 of the steps that received treatment for subjects A and B, respectively. The absence of a treatment effect was agreed on for 1 of 14 steps for subject A and 4 of 13 steps for subject B. Treatment effects occurred more consistently for subject B on the later steps in the VAT protocol. Refer to Table 18-1 for complete details regarding the judges' agreement on the presence or absence of an effect

*The additional figures from which the judgments were made are available upon request from Dr. McNeil.

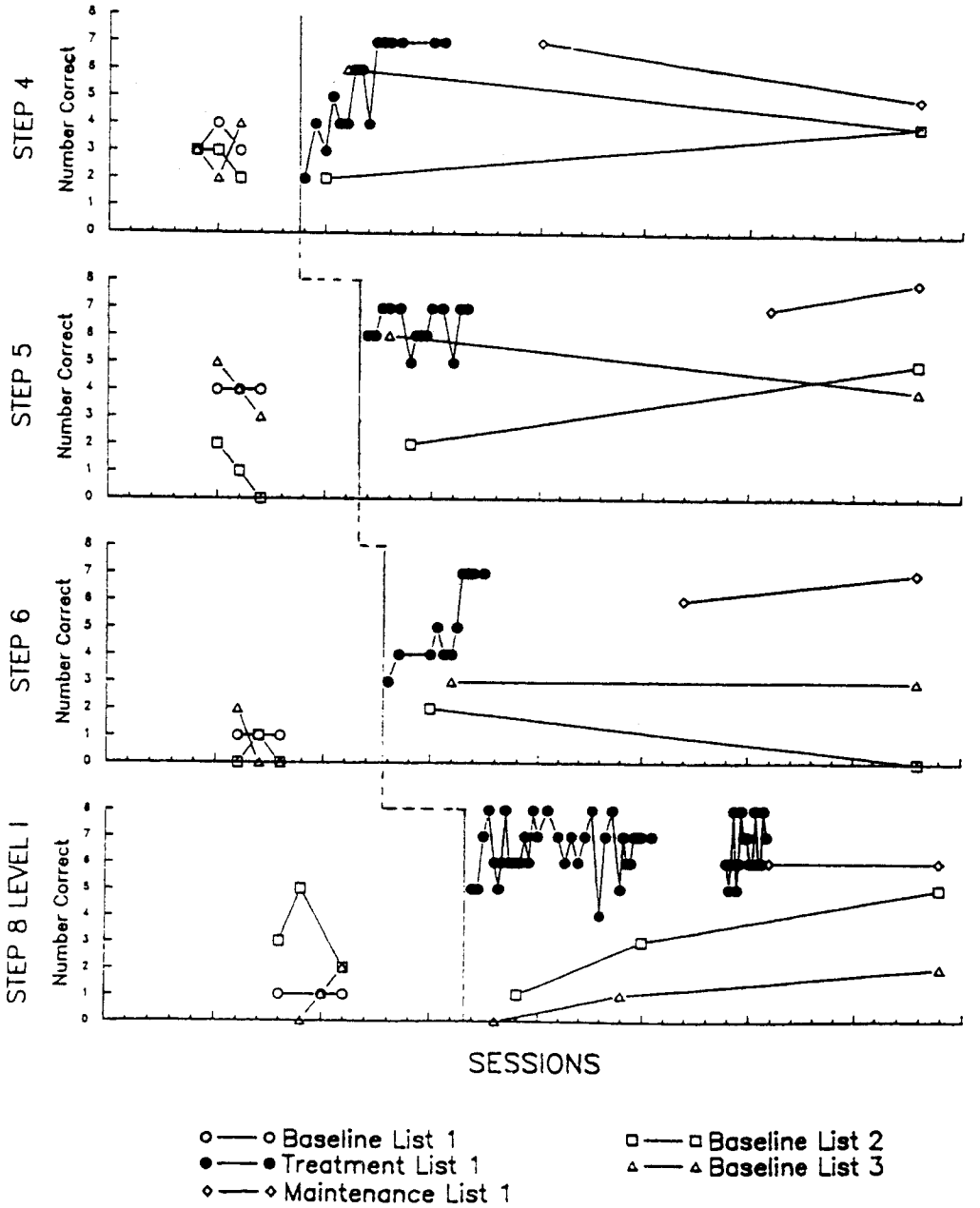

Fig. 18-1. Subject A performance data on level I, steps 4 to 8.

for each of the treated steps. Generalization of the successfully treated steps to untreated lists and steps was extremely poor for both subjects. The judges agreed that generalization had occurred in only one instance. The judges also agreed that generalization had *not* occurred on 10 of the total 18 steps in which positive treatment effects were shown for the two subjects. Interjudge agreement was not reached on the remaining seven steps.

TABLE 18-1. INTERJUDGE AGREEMENT/DISAGREEMENT ON PRESENCE/ABSENCE OF TREATMENT (T), GENERALIZATION (G), AND MAINTENANCE (M) EFFECTS

	Subject A			*Subject B*		
Effect	T	G	M	T	G	M
Step						
2A	+	−	−	0		
2B	+	−	+	−		
2C	+	0	−	0		
2D	+	−	+	−		
3A	−			−		
3B	+	−	−	+	−	−
3C	0			−		
3D	+	0	−	+	0	+
4	+	0	+	0		
5	+	0	+	+	0	+
6	+	0	+	+	+	−
8 I	+	−	+	+	−	0
9 I	+	−	+	+	−	+
10 I	+	−	+	Not treated		

Note: + denotes judge agreement on presence of an effect; − denotes judge agreement on absence of an effect; 0 denotes judge disagreement on an effect. A blank space indicates those instances in which no judgment was made. Generalization and maintenance effects were judged only on those steps which demonstrated positive treatment effects.

Generalization to PICA tasks that required gestural abilities similar to those trained in the VAT program (i.e., subtests II, III, VIII, and XI) was expected. Pretreatment and post-treatment scores on the PICA are presented in Table 18-2. Positive differences in pretreatment and post-treatment scores that exceed test/retest differences (Porch, 1967) for each subtest are noted. While subject A demonstrated a positive increase in performance scores on all anticipated subtests, only subtests III and VIII exceeded test/retest standards. Subject B improved his performance, surpassing test/retest differences, on all anticipated subtests (II, III, VIII, and XI). Note that positive changes in excess of test/retest standards also occurred for both subjects on subtests assessing behaviors and language modalities dissimilar to those trained in the VAT protocol. The overall score improved for both subjects; however, only the performance of subject B surpassed the test/retest reliability standards.

TABLE 18-2. PRETREATMENT AND POST-TREATMENT PICA SCORES BY MEAN SCORE AND PERCENTILE

	Subject A				*Subject B*			
	PRE		POST		PRE		POST	
Subtest	*Mean*	*Percentile*	*Mean*	*Percentile*	*Mean*	*Percentile*	*Mean*	*Percentile*
I	3.0	7	3.4	10	4.2	17	7.3	44*
II	3.2	3	4.0	5	4.0	5	7.7	22*
III	5.7	9	7.3	15*	5.5	9	8.7	21*
IV	3.0	5	3.5	9*	9.1	46	11.0	53*
V	5.3	13	5.1	12	6.8	19	6.1	16
VI	5.1	2	6.6	7*	10.3	22	10.3	22
VII	5.4	9	4.7	2	6.5	12	6.4	12
VIII	5.0	1	11.2	5*	11.0	5	13.4	11*
IX	3.2	6	2.9	5	8.6	41	6.0	29
X	5.2	2	6.8	5*	11.2	19	9.7	14
XI	12.8	4	13.0	4	13.2	5	13.8	7*
XII	3.0	3	3.2	5*	11.4	32	9.2	26
A	3.0	3	3.0	3	3.0	3	4.8	18*
B	3.0	3	3.0	3	3.0	3	3.0	3
C	3.0	3	4.5	11*	3.0	3	4.0	8*
D	5.0	27	5.0	27	3.0	3	4.8	13*
E	5.0	15	5.0	15	3.0	2	4.9	11*
F	4.7	4	4.9	4	4.1	3	6.9	7
Overall	4.70	4	5.39	6	6.72	13	7.76	19*
Gestural	5.96	3	7.39	6	8.56	11	9.51	16
Verbal	3.05	5	3.25	7	8.33	37	8.38	38
Graphic	3.95	5	4.23	6	3.18	2	4.73	9*

*Denotes pre/post differences greater than test/retest differences reported by Porch (1967).

Maintenance of the treated behavior was variable within steps and across subjects. For subject A, the judges agreed that maintenance had occurred on 8 steps and had not occurred on 4 of the 12 steps in which treatment effects were demonstrated. Subject B exhibited only three instances in which the learned behavior was maintained. Absence of a maintenance effect was agreed on for subject B in 2 of 6 steps that showed treatment effects. There was no detectable pattern of what was and was not retained for subject B.

DISCUSSION

This study demonstrated that positive treatment effects occurred on most steps for subject A and on about half the steps for subject B. This was demonstrated by an increase in correct responses on the treated list that exceeded baseline levels, while performance remained relatively near baseline on the untreated lists immediately following the introduction of treatment. The treatment effects that were shown for subject B were judged to have occurred more consistently on the later VAT steps. Note that the VAT protocol is presumably arranged in hierarchical order. This subject had achieved high initial baselines on these early steps, thereby making it difficult to attribute the change in level between phases to the treatment. With one exception, performance on the untreated lists was relatively stable and reflected little generalization within or between steps. This lack of generalization provides both a basis for concluding that the positive changes on the treated items were due to the treatment rather than to other possible sources and evidence that the learned behavior did not influence performance on untreated but similar behaviors.

Positive overall changes on the PICA during this period of treatment occurred for subject B but not for subject A. Each subject demonstrated positive changes in post-treatment scores on PICA subtests that were both similar and dissimilar to VAT steps. However, attribution of any of these PICA changes to the effects of treatment are tenuous without having stable baseline data on these tasks.

While the results of this study are generally consistent with the results presented by Helm-Estabrooks, Fitzpatrick, and Barresi (1982), our conclusions are not consistent with theirs regarding the efficacy of VAT. This study documented increased performance in the trained behaviors, thereby demonstrating positive treatment effects due to VAT. However, these effects in and of themselves are not sufficient data to conclude that VAT was efficacious. Because of poor generalization, the effectiveness

of VAT in achieving the program's original purpose of establishing "symbolic representation," as defined by Helm-Estabrooks, Fitzpatrick, and Barresi (1982), must be questioned. Therefore, it is concluded that the VAT program administered to these two subjects was not effective in providing the precursors to the skills needed for communication.

There are a number of possible sources for this poor generalization. All the treatment steps were not trained before the VAT treatment was terminated. Successfully treated behaviors that were not maintained were not retreated. Perhaps 30 treatment sessions were insufficient to achieve the treatment goal. It also might be that generalization was not achieved because the treatment program does not train symbolic representation as much as limb motor programming and execution. Additional studies using appropriate experimental designs are necessary for further exploration of these and other generalization issues involved in the assessment of VAT's efficacy.

Because of the limited number of subjects in the present study, no generalizations can be made regarding the efficacy of VAT as applied to the globally aphasic population. Based on this investigation and the lack of literature documenting positive VAT efficacy data, it must be concluded that further research is needed before this treatment technique can be confidently recommended for the treatment of globally aphasic persons.

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