CHAPTER

17

A Qualitative Analysis of Response Elaboration Training Effects

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Clinical aphasiologists have dedicated considerable investigative effort to exploring means of facilitating generalization of language training effects (Thompson and Kearns, 1981; Tonkovich and Loverso, 1982; Thompson and Warner, 1987; and Simmons, Kearns, and Potechin, 1987). One generalization-promoting technique that has been extensively examined is the use of "loose training" procedures (Thompson and Byrne, 1984; Doyle et al., 1989). Loose training procedures are designed to reduce clinician control over stimulus, response, and feedback aspects of treatment. With this approach, patients are exposed to numerous and varied parameters that might occur in nontherapeutic settings and the natural environment (Stokes and Baer, 1977). The emphasis in loose training is on facilitating generalized responding by presenting a wider range of stimulus conditions and response options than are typically encountered in highly structured, didactic treatment approaches.

Response elaboration training (RET) was designed to facilitate generalized increases in the amount of informational content produced by aphasic individuals (Kearns, 1985; Kearns and Potechin, 1988). This approach utilizes shaping, chaining, and modeling techniques to combine patients' spontaneous descriptions and subsequent elaborations of action pictures into longer, more contentive responses. The emphasis in RET is on loosening the response parameters of therapy by using patient-initiated utterances as the focus of intervention rather than restricting patient responding to a limited range of clinician-selected target responses.

RET is based on the premise that didactic training procedures may inhibit creative language use and limit generalization. Patients enrolled in RET assume the primary burden of communication during therapy as they produce increasingly more elaborate verbal descriptions of picture stimuli containing minimal contextual information. The communicative success of patient-initiated picture descriptions is reinforced over the form of patient responses. The technique is similar to the "scaffolding" procedure that has been used to facilitate the use of multiword combinations in language-impaired children (Schwartz et al., 1985). Specific RET procedures are diagrammed in Figure 17-1.

Previous studies have focused on the acquisition and generalization of RET training effects (Kearns, 1985; Kearns and Potechin, 1988). Specifically, results have indicated that (1) RET is an effective means of increasing the number of content words produced by aphasic patients, (2) RET facilitates some generalization to untrained stimuli, people, and situations, and (3) increased production of content words is maintained after treatment is terminated. Despite the encouraging quantitative changes in patient responding, little emphasis has been placed on analysis of qualitative changes that occur following RET. For example, we

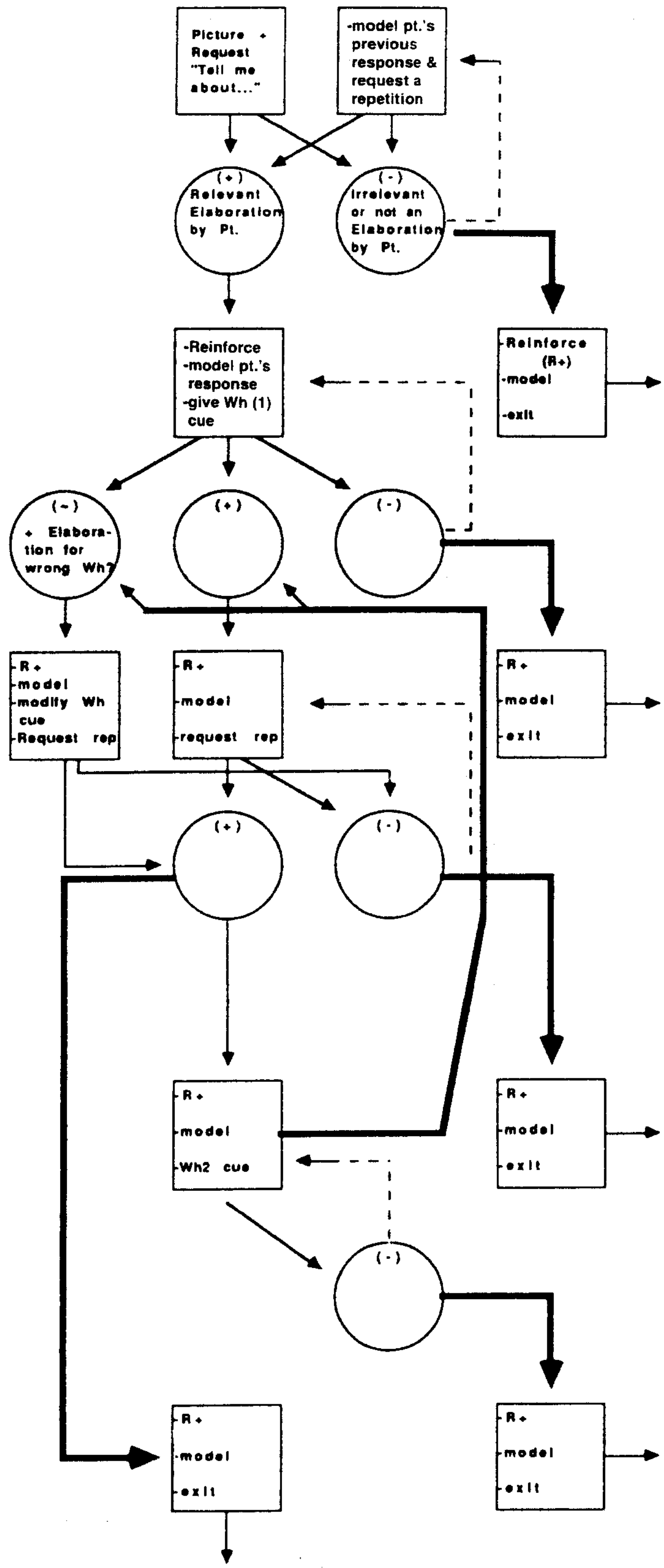

Fig. 17-1. Flowchart of response elaboration training options.

have not explored whether the efficiency of communication is maintained as the number of content words increases during treatment. Similarly, we have not examined the variety of content words produced as a result of training.

PURPOSE

The purpose of this study was to replicate previous findings that support the effectiveness of RET and provide a description of qualitative changes in patient responding as therapy was sequentially applied over time. Specifically, the following questions were addressed:

1. Does RET facilitate an increase in the number of content words produced in response to trained and untrained picture stimuli?
2. Is the efficiency of communication maintained as the production of content words increases?
3. Does RET promote the use of a variety of novel words in response to each stimulus item?

METHODS

SUBJECTS

Three aphasic subjects ranging in age from 57 to 67 years (mean 62.6 years) participated in this study. All subjects suffered a single left-hemisphere cerebrovascular accident (CVA) at least 1 year prior to participation in this study (range 13 months to 9 years). They were classified as having Broca's aphasia on the Western Aphasia Battery (WAB) (Kertesz, 1979). Their WAB aphasia quotients ranged from 34.8 to 54.3. In addition, overall severity levels ranged from the 44th to 64th percentile on the Porch Index of Communicative Ability (PICA) (Porch, 1981). Two subjects (RW, WG) had a residual right hemiparesis. All subjects demonstrated comprehension of the stimulus items used in treatment prior to inclusion into this study.

STIMULI

Training stimuli consisted of 30 stimulus pictures depicting transitive and intransitive verbs. The stimuli were divided into three sets of 10 items each. Two sets were designated for training. The third set was not trained and was used to examine generalization.

The stimuli used during training consisted of 8 by 11-inch black-and-white line drawings that contained minimal contextual information. Noncontextual items were used to circumvent the possibility that subjects would name depicted elements rather than creatively elaborate on action themes presented. Pictures used to assess generalization to untrained stimuli consisted of 8 by 11-inch black-and-white photographs of adults engaged in various sports and activities of daily living.

EXPERIMENTAL ANALYSIS

DESIGN

Both experimental and descriptive data were analyzed for this study. The experimental study was initiated to investigate the effectiveness of RET by using a multiple-baseline across-behaviors design (McReynolds and Kearns, 1983). In addition, qualitative changes in patient responding were examined by means of descriptive analyses of response efficiency and the number of novel content words produced over time. The multiple-baseline component of this study is described below.

Following baseline testing, training was sequentially applied to the two sets of training items. The generalization set was never trained. Clinical probes were administered throughout the study to examine treatment effectiveness and generalization to untrained stimuli. Although not reported here, probes also were administered to assess generalization to untrained individuals and untrained settings.

BASELINE

During baseline sessions, the 30 stimulus items were randomly presented. Subjects were instructed to "as completely as possible, tell me about this picture or whatever it reminds you of." The *dependent variable* was the number of content words produced in response to the picture stimuli. Words were tallied as content words if they were informative and relevant to the primary theme of the picture and they otherwise met criteria for inclusion (see below). Content words did *not* have to be directly depicted in the stimulus picture to be given credit. Feedback and reinforcement were not provided during baseline or probe conditions.

TREATMENT

Treatment sessions were held three or more times weekly for each subject. Training was applied to one set of training items according to procedures diagrammed in Figure 17-1 and described elsewhere (Kearns, 1985) until an individualized criterion was met. Criterion levels of responding were established for each subject based on the level of responding during baseline sessions. Subjects were required to produce 3 to 5 content words in response to 9 of 10 stimulus pictures (90%) across two consecutive probe sessions for both sets of training stimuli. Upon reaching criterion for the first set, RET was then applied to the second set of training items until criterion was met for those items.

DESCRIPTIVE ANALYSIS

Four representative probe sessions from each phase of the study were selected to assess (1) change in efficiency of conveying relevant verbal content and (2) variety of relevant content words between phases of the study. The four probes examined for qualitative changes in patient responding were (1) baseline probe, (2) probe that met criterion for the first training set, (3) probe that met criterion for the second training set, and (4) maintenance probe.

The analyses for efficiency and variety were based on tallies of the numbers of content and total words produced during the four probes identified above. The response definitions used for these parameters were as follows.

Content words were tallied if they were deemed to be closely related to the primary theme of the stimulus picture and conveyed new information. Therefore, they did not have to be directly depicted in the stimulus pictures to be counted in the scoring. Perseverative, stereotypic, unintelligible, irrelevant, and reiterative responses were not tallied.

The manner in which *total words* were counted was adapted from Correia, Brookshire, and Nicholas (1986). All intelligible words, including word substitutions, repetitions, common abbreviations, slang words, lead-in phrases, and filler words, were counted. Contractions and compound words were counted as two separate words. Unintelligible words, neologisms, nonword fillers (e.g., *um, uh, er, ah, mmm*), and isolated sound prolongations or repetitions were not tallied.

Efficiency was defined as the number of content words divided by the total number of words produced per response. This measure was chosen to assess production of relevant content words in relationship to total number of words produced. The efficiency parameter was assessed to determine if observed increases in the number of content words were the result of concomitant increases in opportunity to produce relevant content words. Overall communicative efficiency (e.g., Yorkston and Buekelman, 1980) was not examined in this study, and efficiency was not calculated per unit of time.

A *novel word* was defined as a content word that was not produced during a comparison probe session selected from the previous phase of the study. Hence novel content words were determined by comparing words produced in response to a given stimulus item over time. Thus this measure provided an index of response variety, and it served as a means of determining if patients continuously produced the same rote response across subsequent probes.

RESULTS

RELIABILITY

All probe sessions were audiotaped for reliability purposes. Point-to-point interobserver reliability was examined for each patient during each phase of the study. Interobserver reliability ranged from 92 to 100 percent agreement for content words and between 96 and 100 percent agreement for total words produced. Calculated estimates of interobserver agreement were above the level expected on the basis of chance.

EXPERIMENTAL RESULTS

The first experimental question was, "Does RET facilitate an increase in the number of content words produced in response to trained and untrained picture stimuli?" The results of the experimental analysis of RET effectiveness as examined with the multiple-baseline data are shown in Figure 17-2 for subject JT. Production of content words remained relatively stable ($\bar{X}$ = 2.93) during the baseline phase with a subsequent

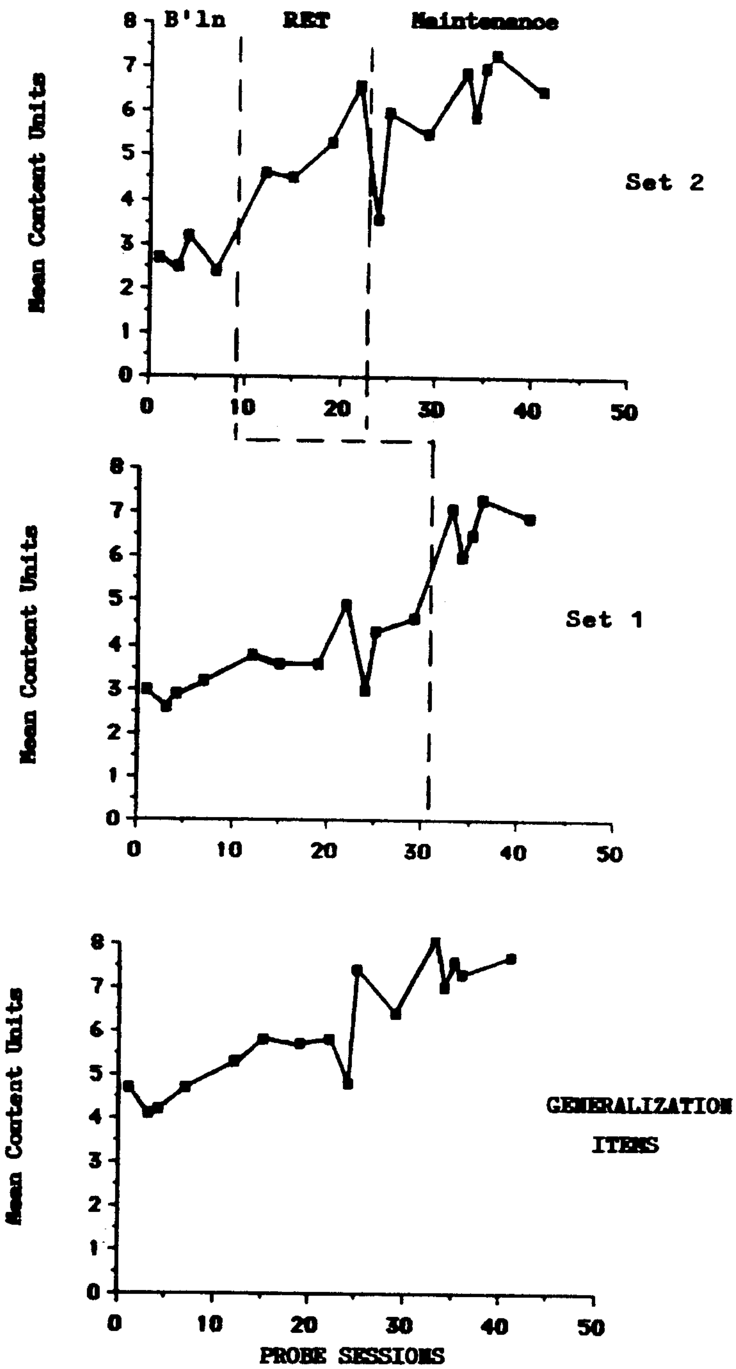

Fig. 17-2. (JT) Mean number of content words for training (*top* and *middle panels*) and generalization (*bottom panel*) stimuli.

increase in the number of content words produced during the treatment phase for the training stimuli that were treated first. JT met training criterion ($\bar{X}$ = 5.0 content words) after 10 treatment sessions (*top panel*, Fig. 17-2). Performance on the second set of training stimuli (*middle panel*, Fig. 17-2) remained relatively stable until treatment was applied.

Rapid improvement was apparent following initiation of treatment. JT met criterion after three additional treatment sessions.

The data for RW and WG are not presented graphically. However, results from these subjects closely replicated the results reported above for JT. Following relatively stable baseline phases, RW and WG both demonstrated increased production of relevant content words after treatment was applied to the two sets of training stimuli. RW met training criterion ($\bar{X} = 4$) on the first set of training stimuli after approximately 35 sessions. Performance on the second training set remained stable until training was implemented. The training criterion on the second set of training stimuli was met after 15 treatment sessions.

WG met criterion ($\bar{X} = 3.0$ content words) after 75 treatment sessions on the first set of stimuli. Following intervention, 35 additional treatment sessions were needed to meet criterion for the second set of treatment stimuli.

Although each subject required a varying number of treatment sessions to meet the individualized training criteria, all subjects demonstrated relatively stable baselines and then produced an increased number of content words once treatment was applied to each set of training stimuli. Additionally, all three subjects demonstrated some generalization of increased verbal elaboration skills to untrained stimuli. (Increases in the number of content words produced in response to untrained picture stimuli ranged from 1.1 to 3.6 with a mean of 2.2.)

QUALITATIVE ANALYSES

Efficiency

The second experimental question was, "Is efficiency maintained as the production of content words increases?" Of primary interest was a description of qualitative changes observed as production of content words increased. Subject JT increased the number of relevant content words produced with no remarkable loss in efficiency (content words per total words). Efficiency ranged from 85 to 88 percent for the first training set, 82 to 87 percent for the second training set, and 59 to 86 percent for the generalization set. Individual variability was seen between subjects, with subjects RW and WG demonstrating efficiency ratios that were much lower than JT's. Efficiency ranged from 13 to 20 percent (first training set), 23 to 20 percent (second training set), and 8 to 14 percent (generalization set) for subject RW. Efficiency ranged from 11 to 21 percent (first training set), 11 to 13 percent (second training set), and 10 to 23 percent (generalization set) for subject WG.

The variability observed in efficiency levels across subjects is not unexpected, given that normal geriatric adults on the same speaking task also demonstrated a wide range of efficiency levels (mean of 46 percent, range between 32 and 53 percent). Although a wide range of relative efficiency levels was noted across subjects, within-subject comparison reveals that there was no remarkable decrease in efficiency concurrent with increases in informational content.

Novel Content Words

The final question was, "Does RET promote the use of a variety of novel words across the phases of the study?" Figure 17-3 presents the change in the number of content words (solid bars) and the number of novel content words (open bars) produced between experimental phases for subject JT. The top panel of the graph presents different scores for total and novel words produced in response to the first set of items that were trained (set 2). The middle and bottom panels present data for the second set trained (set 1) and generalization items, respectively. In general, the overall pattern across all three sets indicates that between-phase increases in number of novel content words produced (open bars) were consistently greater than changes in the number of content words (closed bars) produced. For example, examination of data in the top panels of Figure 17-2 demonstrates differences in performance on baseline probes versus probes obtained after criterion was met (B1'n - Tx1) for set 2 items. These data reveal that there was an increase of 26 relevant content words (filled bars). In addition, a greater number of novel content words (44) were produced. Thus not only was JT producing more content words, but he was also producing a variety of content words. That is, there was considerable variety over time in the content produced. Interestingly, even when JT demonstrated a slight decrease in the number of content words produced during the maintenance phase (*top panel, far right*, Fig. 17-3), he continued to produce a variety of relevant content words. Although subjects RW and WG demonstrated smaller increases in the number of content words and novel words produced between phases of the study, both subjects produced increasingly more novel content words during each phase of the study.

DISCUSSION

The results of the multiple-baseline portion of this study provide support for the effectiveness of RET for increasing the number of content

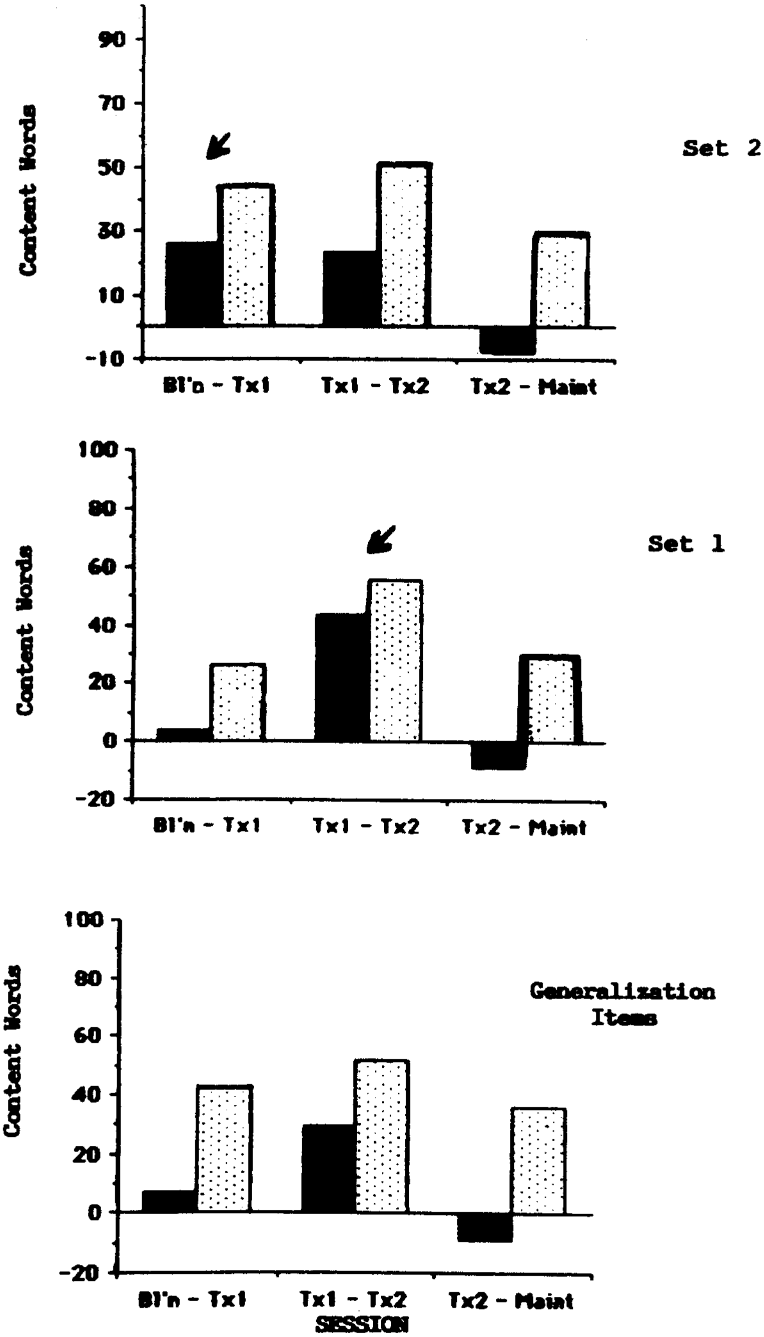

Fig. 17-3. (JT) Change in number of content words (*solid bar*) and number of novel content words (*open bar*) between successive phases of the study.

words in response to trained stimulus pictures. Further, these data show that some generalization to untrained stimuli may occur. Although not specifically reported here, generalization to novel persons and settings was apparent and also can be anticipated as a benefit of RET. Overall, these findings replicate previous studies that show RET to be an effective means of increasing the number of content words produced by aphasic patients with facilitation of generalization to untrained stimuli, people, and settings (Kearns, 1985).

This study also sought to provide preliminary descriptive analyses of qualitative changes in responses produced on probes during RET. Our findings indicate that the efficiency of conveying relevant information remains relatively stable as increases occur in the number of content words produced. Thus increases in the informational content do not appear to be the result of overall increases in total number of words produced. In addition, the qualitative analyses also suggest that RET promotes the use of a variety of content words over time. Interestingly, the increased variety of content words was maintained even though the overall quantity of words produced decreased slightly during the maintenance phase of the study.

While the results of our qualitative analyses are encouraging, changes in communicative efficiency as measured by more traditional means, such as number of content words produced per units of time (e.g., Yorkston and Buekelman, 1980), are needed and currently underway. Performance on generalization probes is also being assessed qualitatively to determine if efficiency and response variety generalize to untrained stimuli, persons, and settings. Finally, the effects of RET on performance in more naturalistic, conversational situations and everyday speaking tasks is also planned for future investigations.

In summary, the results of this study support the effectiveness of RET and demonstrate that increased production of relevant content words does not occur as a result of an overall increase in total words produced. In addition, these data support the conclusion that RET promotes the use of a variety of relevant content words. Replications of these findings are needed to support these preliminary conclusions.

ACKNOWLEDGMENT

This research was supported in part by VA Rehabilitation Research and Development funds.

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