Investigations of response elaboration training (RET) have demonstrated increases in the production of content for most participants (Kearns, 1985; Kearns & Sher, 1989; Yedor, Gaddie, Kearns, & Yedor, 1991; Yedor, Conlon, & Kearns, 1992; Wambaugh & Martinez, 2000). Although systematic research has explicated the acquisition and response generalization effects of RET, there has been limited examination of its stimulus generalization effects (i.e., the use of learned behaviors in different contexts). That is, stimulus generalization effects have been measured with only a few participants and measurement conditions have varied across participants.

The purpose of this examination was to further examine the stimulus generalization effects of RET across discourse conditions that varied in terms of degree of "naturalness".

Method

Participant

One male Caucasian speaker with chronic Broca's aphasia and moderate apraxia of speech (AOS) served as the participant. Pretreatment assessment results are displayed in Table 1 and descriptive data are displayed in Table 2.

Experimental stimuli

Thirty-six black and white drawings portraying actions served as experimental stimuli. These were divided into three sets of twelve pictures (Appendix).

Experimental design

A single-subject multiple baseline design across behaviors and contexts was employed to examine the acquisition and generalization effects of RET. The following discourse elicitation contexts comprised the multiple baselines: 1-3) picture descriptions – three sets, 4) five minute personal recounts, and 5) home conversations with spouse. Treatment was applied sequentially to one picture set, then a second picture set, and finally to the personal recount condition. Production of correct information units (CIUs; Nichols & Brookshire,1993) served as the dependent measure for each of the above conditions.

Baseline. Repeated measurements of production of CIUs were obtained in all conditions during the baseline phase. In the picture description condition, the participant was instructed to "Tell me as much as you can about the picture; you can talk about the picture or anything it reminds you of." In the personal recount condition, the participant was asked to talk for five minutes about any topic(s) of his choice. In the home conversation condition, the participant and his spouse were provided with general instructions and asked to record a dinner time or evening conversation once per week. All of the preceding discourse samples were audio recorded, transcribed orthographically, and coded for production of CIUs.

Treatment. RET was designed to increase the content and length of utterances (Kearns, 1985). It was developed on the premise that treatment should encourage the creative use of language rather than require the production of predetermined, convergent responses. Consequently, the participant is encouraged to produce any relevant response and that response serves as the basis of treatment involving modeling, forward-chaining, and feedback. The application of RET to pictures followed procedures established by Wambaugh and Martinez (2000). The application of RET to personal recounts required a

slight modification to accommodate the participant's interaction style (to be described in poster). One hour treatment sessions were conducted 3 times per week. Treatment was continued in each condition until no improvements were evident over 3 consecutive sessions (or the participant indicated a desire to change training conditions).

Probes, identical to those conducted during baseline, were conducted throughout the treatment phase in all conditions. Probes were always conducted prior to treatment and were scheduled following completion of a prescribed number of treatment sessions (e.g., following four treatment sessions for the condition under treatment).

Reliability

Ten percent of probe sessions will be randomly selected to calculate inter-rater point-to-point reliability.

Results

Figure 1 depicts CIU production during probe sessions in all elicitation conditions. As seen in the top graph, the participant's production of CIUs in response to Set 1 pictures was stable during baseline with an average of 24 total CIUs produced in response to the 12 pictures. Upon application of treatment to Set 1, an increase in production of CIUs was observed; in the final three probes of the first treatment phase, the participant produced an average of 120 total CIUs.

Increases in production of CIUs in the untrained conditions also occurred following treatment of Set 1. CIU production a) for Set 2 items increased by approximately 35 CIUs, b) for Set 3 items increased by approximately produced 20 CIUs, c) in personal recounts increased by about 10 CIUs (although not consistently), and d) in home conversations increased by approximately 10 CIUs (also not consistently).

When treatment was applied to Set 2 items, additional increases were observed for that set of items as well as for Set 3 and personal recounts. At the conclusion of treatment for Set 2, additional probing was required to establish stability of responding in the personal recount condition.

Upon application of treatment to the personal recount condition, additional gains were not evident in this condition although responding appeared to stabilize. No additional changes were observed in the other conditions.

Maintenance was measured by continual measurement of previously trained behaviors. The participant evidenced positive maintenance effects in that productions remained at levels well above baseline following the withdrawal of treatment. Follow-up measurements were not possible because the participant moved to another state immediately upon the conclusion of personal recount training.

Please note that analysis of behavior change across study phases according to procedures described by Fisher, Kelly, and Lomas (2003) is planned, but has not yet been completed.

Discussion

The acquisition and response generalization findings from this investigation were consistent with results of previous RET investigations (Kearns, 1985; Kearns & Sher, 1989; Yedor, Gaddie, Kearns, & Yedor, 1991; Yedor, Conlon, & Kearns, 1992; Wambaugh & Martinez, 2000). That is, the participant responded positively to both trained and untrained picture sets. Interestingly, generalization effects of Set 1 training

were stronger to Set 2 than to Set 3. Set 3 was purposely probed a restricted number of times in order to limit exposure. The more frequent exposure of Set 2 may have had a "treatment effect" in terms of promoting additional generalization. Set 3 performance continued to increase during Set 2 training, which may have been due to additional exposure or to the additional training.

Treatment of pictures resulted in improved performance during personal recounts, and possibly during home conversations. It appeared that the participant reached his maximum level of performance in these conditions as a result of picture training. That is, personal recount training did not result in additional gains. These findings are somewhat dissimilar to those of Wambaugh and Martinez (2000). Participant characteristics may have some explanatory power relative to the difference in personal recount findings in this investigation (these will be discussed in the poster).

Unfortunately, personal issues (i.e., a divorce) likely had an impact on the results of this investigation. The participant's personal concerns were not disclosed to the investigators until approximately 3 weeks prior to the conclusion of data collection. Had such issues been divulged earlier, the design may have permitted adjustments to be made (e.g., addition of a different conversational condition).

Other limitations of this research will be discussed and suggestions for future research will be provided.

Acknowledgements

References

Dabul, B. (1979). *Apraxia Battery for Adults.* Tigard, OR: C.C. Publications.

Fisher, W.W., Kelley, M.E., & Lomas, J.E. (2003).Visual aids and structured criteria for improving visual inspection and interpretation of single-case designs. *Journal of Applied Behavior Analysis, 36, 3,* 387–406.

Gaddie, A., Kearns, K. P., & Yedor, K. (1991). A qualitative analysis of response elaboration training effects. *Clinical Aphasiology, 19*, 171-183.

German, D. J. (1990). Test of Adolescent/Adult Word Finding. Allen, TX: DLM.

Kearns, K.P. (1985). Response elaboration training for patient initiated utterances. In R.H. Brookshire (Ed.), *Clinical Aphasiology* (pp. 196-204). Minneapolis, MN: BRK.

Kearns, K., & Scher, G. P. (1989). The generalization of response elaboration training effects. *Clinical Aphasiology, 18*, 223-245.

Kearns, K. P., & Yedor, K. (1991). An alternating treatment comparison of loose training and a convergent treatment strategy. *Clinical Aphasiology, 20*, 223-238.

Kertesz, A. (1982). *The Western Aphasia Battery.* New York: Grune & Stratton.

McNeil, M.R., Robin, D.A., & Schmidt, R.A. (1997). Apraxia of speech: definition, differentiation, and treatment. In M.R. McNeil (Ed.) *Clinical management of sensorimotor speech disorders* (pp. 311-344). New York: Thieme.

Nicholas, L.E., & Brookshire, R.H. (1993) A system for quantifying the information and efficiency of the connected speech of adults with aphasia. *Journal of Speech and Hearing Research*, 36, 338-350.

Porch, B. (1981). *Porch Index of Communicative Ability: Vol II. Administration, scoring, and interpretation, 3rd edn.* Palo Alto, CA: Consulting Psychologists Press.

Wambaugh, J. L., & Martinez, A. L. (2000). Effects of modified response elaboration training with apraxic and aphasic speakers. *Aphasiology, 14, 5/6,* 603-617.

Yedor, K. E., Conlon, C. P., & Kearns, K. P. (1992). Measurements predictive of generalization of response elaboration training. *Clinical Aphasiology, 21*, 213-233.

Yorkston, K.M. and Beukelman, D.R. (1981). *Assessment of Intelligibility of Dysarthric Speech.* Austin, TX: Pro-Ed.

Appendix

Word Lists

List #1	List #2	List #3
bending	bleeding	barking
dropping	bouncing	digging
floating	crossing	drilling
ironing	drawing	knitting
kneeling	dreaming	lighting
licking	juggling	melting
marching	praying	playing
rocking	pushing	ringing
sailing	sinking	sewing
sliding	swinging	stopping
sneezing	weaving	tickling
watering	weighing	typing

Table 1

Pre Treatment Assessment Results

Measure	Score
Western Aphasia Battery (Kertesz 1982)	
Aphasia Quotient (AQ)	34.8
Subtests (AQ totals)	
Information content	3
Fluency	4
Comprehension	6.5
Repetition	1.6
Naming	6.6
Aphasia type	Broca's
Porch Index of Communicative Ability (Porch 1981)	
Overall average	9.44
Overall percentile	35th
Verbal percentile	41th
Auditory percentile	34rd
Test of Adolescent/Adult Word Finding (German 1990)	
Total raw score (107 possible)	5
Assessment of Intelligibility of Dysarthric Speech (Yorkston & Beukelman 1981)	
Word level -- percent	62
Apraxia Battery for Adults (Dabul 1979)	
Severity ratings	Moderate
AOS characteristics (after McNeil *et al.* 1997)	
slow rate in all productions	yes
inability to increase rate & preserve sound integrity	yes
phoneme distortions	yes
distorted perceived sound substitutions	yes
errors relatively consistent in type and location	yes
intrusive schwa	yes
articulatory groping	yes
Narrative & Procedural Discourse (stimuli from Nicholas & Brookshire 1993)	
Average CIUs	5.63
MLU	1.7

Table 2

Participant characteristics

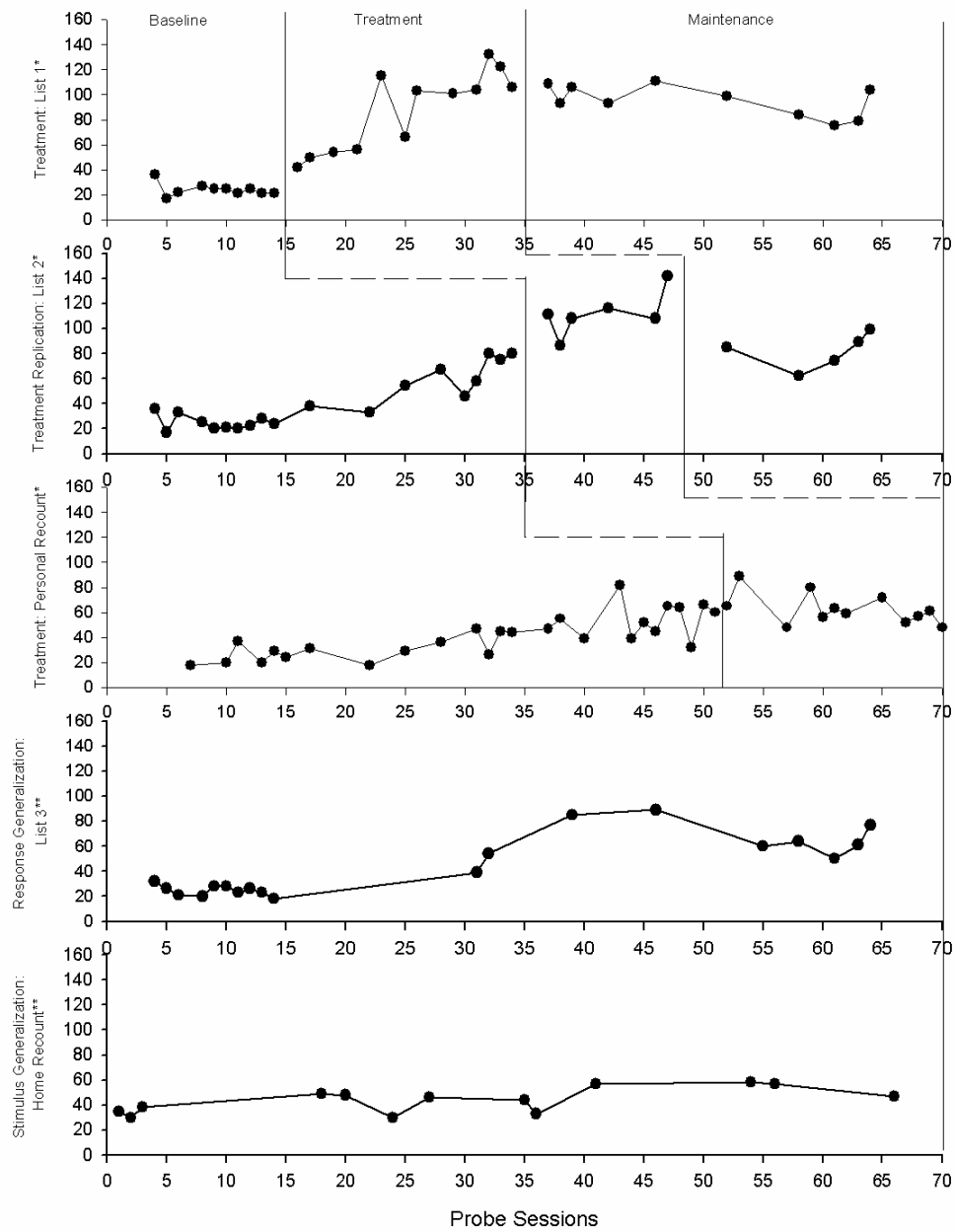| Characteristic	RET1
Age	38
Gender	male
Months post-onset	30
Years of education	12
Former occupation	construction
Pre-morbid handedness	right

Figure 1. Probe session data for Lists 1-3, PR and HR for subject RET1. The unit of Measurement is CIUs.

*Graphs 1-3: Average number of CIUs produced, **Graphs 4-5: average number of CIUs produced in a 5-minute sample