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## **Reading Comprehension Accuracy for Conversational versus Decontextual Written Choices in Severe Aphasia**

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### Abstract

This study systematically evaluated the reading comprehension ability of five individuals with severe aphasia when text was presented in decontextualized (DSRT) versus contextual (CCRC) conditions. Five sets of 10 unrelated questions and four corresponding response choices were administered graphically in the DSRT condition. Four response choices representing potential answers to 10 related conversational questions were presented auditorially and graphically in the CCRC condition. Both sets of stimuli were at the 3.5 to 4<sup>th</sup> grade level. Results indicated that all 5 participant with moderate-severe aphasia and alexia scored significantly higher on the CCRC than the DSRT stimuli. Clinical implications will be discussed.

### Research Description

Peach (2001) noted that very severe, or *global*, aphasia is the most commonly resulting type of aphasia. Persons with global aphasia often cannot speak, comprehend spoken language, write, or read without difficulty (Damasio, 1991; Davis, 1983; Kertesz, 1979). Chapey (2000) and others have observed that there is little clinical research on this population (Helm-Estabrooks, 1984; Peach, 2001). However, communication techniques recently have been developed to enhance interaction between people with global aphasia and their communication partners. Many of these techniques, such as Written Choice Conversation and Augmented Input (Garrett & Beukelman, 1998; Kagan, 1998) are text-based, meaning communicators must comprehend the meaning of text to participate in the conversational exchange.

However, some authors (Koul & Corwin, 2003) have stated that these techniques cannot work with persons who have severe aphasia because of the historical impression that reading abilities are too severely impaired in this population. Previous research has consistently documented the presence of significant reading deficits for people with severe aphasia in *decontextualized*, or test-type, conditions (Helm-Estabrooks, 1984; Mayer & Murray, 2002; Webb & Love, 1983). However, the present investigators and others (Beeson & Hillis, 2001) suggest that previous research has not assessed *contextual* reading ability (i.e., reading that

involves presentation of familiar topical information in a conversational order and with multiple modalities).

### Purpose and Research Question

This study was designed to systematically evaluate the following research question: Is there a difference between the comprehension scores obtained from independent readings of decontextual reading stimuli (DSRT-Condition A) and those presented in the context of written conversations (CCRC-Condition B) in participants with moderate and severe aphasia?

### Methods

*Participants.* Five men with moderate or severe aphasia participated in this study. They were enrolled in sequential order who are already enrolled in aphasia treatment programs at the Speech-Language-Hearing Clinics at Duquesne University and Florida State University. They were between the ages of 30 and 85; were at least 1 year post-onset of a single, focal left hemisphere CVA; spoke English as a primary language; had a minimum of a 12<sup>th</sup> grade education; could read and comprehend a newspaper pre-morbidly; had no dramatic fluctuations in alertness due to medical conditions; demonstrated functional visual and hearing acuity (aided or unaided hearing (aided or unaided)); and showed no evidence or reported history of disease processes associated with dementia or chronic substance abuse. Participants #1 and #5 best fit a profile of global aphasia; Participant #2 demonstrated fluent aphasia associated with severe Wernicke’s syndrome; and Participants #3 and 4 had profiles most closely associated with nonfluent Broca’s aphasia. *Western Aphasia Battery (WAB; Kertesz, 1982)* aphasia quotients and reading subtest scores follow:

	<u>Participant</u>			
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>5</b>				
<u>Western Aphasia Battery AQs</u>	1.9	9.7	26.2	47
17				
<u>Reading Subtest Score – WAB (of 10)</u>	.6	2.7	1.9	NA
NA				

### Design.

A single subject comparative condition (AB) design with repeated measures was used to compare decontextualized reading comprehension scores with contextualized reading scores within and across the 5 participants.

### Stimuli administration.

A set of 10 questions and 4 corresponding response choices for each of the two conditions (decontextual, contextual) were presented, in counterbalanced order, in each of 5 experimental sessions by graduate students who were assigned to work clinically with the participant throughout the semester. A total of 50 responses (5 sets of ten) were obtained per condition for each of the participants. Questions and responses choices were constructed in

advance for the decontextual (DSRT) condition. Questions were unrelated, and foils consisted of one semantically related word, one visually similar word, and one unrelated word. The question and responses were presented graphically (only) to simulate reading comprehension tasks found in typical speech-language treatment workbooks. A sample DSRT stimulus is: “WHERE DO YOU PLACE DIRTY DISHES AFTER EATING A MEAL?”

- \*BATHTUB
- \*SINK
- \*CHEESE
- \*SAUCER.

Written choice (CCRC) questions and responses were generated “on-line” to emulate the typical clinical method of using the Written Choice Conversation (Garrett & Beukelman, 1995) technique; after the examiner asked the conversational question, she wrote and orally stated 4 logical responses to the question. Questions were related in that they followed a conversational sequence. An example of a written choice question and corresponding responses presented during a conversation is:

“HOW DID YOU LEARN TO DRIVE A CAR?”

- SCHOOL
- YOUR DAD
- ON YOUR OWN
- A FRIEND.

Readability in grade level, a measure of text difficulty, was computed with the FOG readability formula (FOG Index [n.d.] Obtained 7/4/2005 from <http://athena.english.vt.edu/~hagedorn/TechnicalWriting>). Reading grade levels ranged between 3.5 and 4 for both conditions, indicating equivalent levels of text difficulty.

#### Data collection.

All experimental sessions were videotaped. The administering clinicians scored data online for correctness and/or accuracy. Additionally, the participant’s spouse or family member rated CCRC responses to indicate the likelihood that the person with aphasia would have responded similarly before his/her stroke. Responses that were considered highly unlikely or incorrect were counted as errors. Interrater scoring reliability was 100% for DSRT, and 90% for CCRC written choice responses.

#### Results.

Across all sessions and participants, CCRC comprehension scores were always higher than DSRT comprehension scores. Mean comprehension scores, standard deviations, and ranges for 4 of the 5 participants are presented in the table below. Data for the 5<sup>th</sup> subject is forthcoming.

Value	Decontextualized (DSRT) Reading Comprehension Accuracy Scores	Contextualized Choice (CCRC) Reading Comprehension Accuracy Scores
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Mean	<b>4.1 / 10</b>	<b>9.5 / 10</b>
S.D.	1.03	.55
Range	1-6	7-10

When data were statistically analyzed with a nonparametric test of dependent means called randomization testing (Hayes, 1998), comprehension scores were higher for CCRC than DSRT at statistically significant levels ( $p \leq .01$ , one-tailed).

### Conclusions.

Across the 4 participants with completed data analyses, scores on decontextualized reading tasks appeared to be somewhat consistent with their limited performance on standardized tests of reading comprehension. In contrast, their ability to comprehend written choices presented contextually (i.e., within conversational topics, with multimodal presentation), was significantly higher and approached 100% accuracy. This effect was robust across the range of aphasia severity.

### Clinical Implications

Results for the three individuals with severe-to-profound aphasia directly contradict Koul and Corwin's (2001) statement that people with severe aphasia cannot comprehend written conversational choices well enough to benefit from their use within a partner-supported conversational strategy. Instead, when text is presented in a topical context and with multimodal (auditory, visual) support, persons with global aphasia (and other severe aphasia syndromes) can read well enough to use the Written Choice Conversation technique (Garrett & Beukelman, 1995) to interact and answer consecutive questions in partner-supported conversations. Data for participants 3 and 4 also suggest that the difference between decontextual and contextual reading skills exists also in individuals with only moderate aphasia.

These findings suggest that clinicians who utilize decontextualized reading measures during assessment may be overlooking residual reading capabilities revealed with more highly contextualized materials. Reading in conversational contexts (with multimodal presentation) is the essence of the Written Choice Conversation Strategy (Garrett & Beukelman, 1993; 1995). This strategy has been shown to enhance the quality and quantity of interaction between individuals with severe aphasia and their communication partners (Garrett & Beukelman, 1995; Lasker, et al., 1997). Implementing contextualized reading approaches during assessment of people with severe aphasia may lead clinicians and family members to explore a useful strategy for enhancing functional, interactive communication.