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Verbal and Simplified Sign System Treatments in Adults with Acquired Anomia of Speech

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Abstract

This exploratory study investigates Simplified Sign System and Verbal Only treatments in persons with Alzheimer's Disease (AD). Two participants with AD were recruited to participate. A single case study design was used to train picture naming over 7 separate visits: 1) Verbal Only and 2) Simplified Sign System. For Verbal Only, participants verbally named target nouns and answered yes/no questions about semantic and phonological word relationships. For Simplified Sign, participants verbally named target nouns and produced associated Simplified Sign gestures. Preliminary results indicated a large effect for Verbal Only, and medium effect for Simplified Sign System, with no generalization to untrained words. Preliminary data provides evidence to support the hypothesis that naming skills may be enhanced through increased input (semantic, phonological, gestural), however, neither approach generalized to untrained words. Results will be discussed in terms of the benefit of gesture as an augment to speech when words are unavailable.

Research Description

Introduction and Background Information

One common symptom in persons with Alzheimer's Disease (AD) is difficulty in the activation of semantic information in the retrieval of phonological word forms in naming. Few studies have addressed strategies, such as training manual signs or gestures, to improve word-finding and communication effectiveness in persons with AD. Faced with an aging population and increased incidence of dementia, researchers need to examine treatment strategies to determine which strategies assist persons with AD communicate more effectively with others and which strategies help them maintain their present level of communication function.

Much of our knowledge of naming abilities in persons with AD is taken from the literature in adults with aphasia. For example, in aphasia, both semantic and phonological cueing treatments lead to improved naming of trained words for individuals with semantic, phonologic, and mixed anomia (Wambaugh et al., 2003). Past studies have also shown that the production of manual signs and gestures are largely beneficial to communication in persons with anomia (Rose & Douglas, 2001; Rose, 2006; Pashek, 1997). More recently, the Simplified Sign System was developed by Dr. John Bonvillian as a means to provide persons with communication disability an easier way to communicate. The Simplified Sign System is characterized by highly iconic signs (i.e., transparent gestures; Bonvillian, 2009). Past studies have also shown that the production of

manual signs and gestures frequently facilitates communication in persons with anomia. (Bonvillian, Kissane, Dooley, & Loncke, 2009).

In a preliminary study, an adult with Broca's aphasia learned to use the Simplified Sign System and an electronic communication device following a systematic training program (Braddock, et al., 2008). Although the electronic communication device was more readily trained (i.e., BA Barr, Loncke et al., 200), the participant also effectively used the Simplified Sign System to communicate action and affective information. These results are important because augmentative strategies used in adults with aphasia may also be beneficial.

In particular, strategies considered more naturalistic, such as manual sign and gesture, may offer persons with AD a portable and more flexible augmentative communication system. In persons with AD, the Simplified Sign System may provide a compensatory strategy to circumvent blocks in communication. Given the close link between language and gesture, the Simplified Sign System may provide for a reorganization approach to facilitate improvement in language abilities (i.e., reinforce semantic and/or phonological word relationships over treatment).

Purpose

This exploratory study investigates the use of the Simplified Sign System and Verbal Only treatments in persons with moderately severe AD. For some individuals with AD, motor movements practiced through the Simplified Sign System may provide for a reorganization approach to facilitate language abilities. At the very least, the Simplified Sign System, given its high iconicity, may act as a compensatory strategy to stand in the place of speech when spoken words are unavailable.

Method

Two participants with AD were recruited into this study. Potential participants completed two standardized language tests: *Western Aphasia Battery-Revised (WAB-R; Kertesz, 2006)*, and the *Boston Naming Test (BNT; Goodglass, Kaplan, & Barresi, 2001)*. All participants scoring less than 20% on the *BNT* were eligible for participation. In addition, caregivers were asked to rate their perception of the participant's communication ability (*Communication Effectiveness Index, CETI; Lomas et al., 1989*).

Sixty nouns balanced in the frequency of word occurrence in everyday communications were preselected for baseline. Following 3 baseline naming trials, Vocabulary Sets were established for each participant (i.e., nouns maintained in Vocabulary Set if named incorrectly at least one time).

The following 3 Vocabulary Sets were established: 1) Untrained Vocabulary Set 1 ; 2) Verbal Only Vocabulary Set 2; and 3) Simplified Sign System Vocabulary Set 3. The single case study was organized in the following manner: 1) Baseline Vocabulary Sets 1, 2, 3 (presented over 3 visits); Treatment Verbal Only Vocabulary Set 2 (treatment over 7 visits); 3) Maintenance Verbal Only Vocabulary Set 2 (presented over 2 visits); 4) Treatment Simplified Sign System Vocabulary Set 3 (treatment over 7 visits); and 5) Maintenance Simplified Sign System Vocabulary Set 3 (presented over 2 visits). Data collection for the Untrained Vocabulary Set 1

was completed at each visit (i.e., 21 visits). Participant 1 received the Verbal Only treatment first; followed by the Simplified Sign System treatment. The order of treatment presentation was rotated for Participant 2.

All stimuli were presented through the Lingraphica Communication device (www.aphasia.com) in order to provide for consistency in picture and Simplified Sign System presentation.

Treatment Intervention (adapted from Raymer et al., 2006). For Verbal Only, the investigator presents the picture and models the target word, and the participant repeats the word 3 times. Next, the participant answers a series of four yes/no questions about the semantic features of the word and phonological features (sounds like rhyming word, starts with the initial phoneme). If the participant answers the question incorrectly, the investigator repeats the question and supplies the answer. After a few seconds delay, the investigator asks the participant to name the picture again (and the response is modeled correctly if in error, or reinforced if correct).

For the Simplified Sign System, the investigator presents the picture and models the target word with the Simplified Sign production, and asks the participant to produce the word with Simplified Sign three times. Next, the investigator presents the Simplified Sign and asks the participant to imitate it 3 times. The investigator asks the participant to repeat the word 3 additional times. After a few seconds delay, the investigator asks the participant to produce the word with its Simplified Sign equivalent three times.

Videotaped assessment for practiced Vocabulary Sets followed intervention, and the percentage of correct responses was scored. A correct verbal response is scored if the participant named the picture correctly without cues from the investigator. All manual hand gestures representing the pictured item are further described by type (i.e., iconic naturalistic gesture, or Simplified Sign System production) and co-occurrence with speech (produced with or without speech).

Results

Preliminary results for Participant 1 indicate a large effect for naming following Verbal Only treatment (Mean_{Baseline} = 10.67, SD = 4.62; Mean_{Maintenance} = 83.00, SD = 0.00; $d = 15.66$), and medium effect for Simplified Sign System treatment (Mean_{Baseline} = 18.0, SD = 8.66; Mean_{Maintenance} = 73.5, SD = 16.26; $d = 6.41$). The magnitude of the effect size was interpreted using benchmarks from previous studies in lexical retrieval treatments (Beeson & Robey, 2006). Data for Participant 2 has not been fully collected and analyzed. Analysis of manual gesture type and co-occurrence with speech will follow for Participants 1 and 2.

Conclusion and Clinical Implications

These preliminary data provide evidence to support the notion that naming skills can be enhanced following training (semantic, phonological, gestural) in individuals with AD; however, little generalization is evident to untrained words. Medium to large effects found for treated words is important clinically, in that clinicians and caregivers may choose to target a few functional words for improved communication effectiveness. Family and caregivers may be easily trained in the use of the Simplified Sign System and Verbal Only treatments to ease the burden of communication in expected caretaking situations. Further, the Simplified Sign System may be helpful to augment spoken language when speech is difficult or unavailable.

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