Understanding the effects of cuing strategies through error analysis

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Accepted 8 July 2005
Available online 24 August 2005

Introduction

The aim of this study was to understand the effectiveness of two self-cuing strategies for naming in individuals with aphasia through the analysis of error types. In previous work, Farias, Davis, Lundstrom, and Osecheck (2002) found that after failed naming attempts, drawing facilitated access to the object name more than attempts to access the name through orthographic self-cuing. Drawing, which is free of linguistic symbols inherent in traditional modes of therapy (Lyon, 1995), may provide an alternate route to the object name.

Drawing may facilitate a deeper level of semantic processing through increased attention to the structural and perceptual aspects of the object. In the process of drawing the individual accesses and attends to the details of the object. This systematic focus of attention may help to either inhibit the competitors of the target or increase activation of appropriate features of the desired target. We hypothesize that individuals with left brain damage, who fail to name an object, may access the semantic knowledge of that object by drawing it and thereby improve access to the name or produce error types that are closer to the target.

Here, we compare the distribution of naming errors in eight individuals with left brain damage while using the self-cuing strategies of drawing and writing. Writing provided a good control condition because it is a common strategy used in aphasia therapy for facilitating naming and like drawing it requires a graphic output. Additionally, writing is known to activate primarily left hemisphere regions, whereas drawing may activate semantic networks that are represented bilaterally (Makuuchi, Kaminaga, & Sugishita, 2003), and remain intact in the undamaged right hemisphere.

Methods

Subjects

Eight individuals with left cortical lesions and concomitant aphasia participated in this experiment. These individuals were recruited from the outpatient rehabilitation units of a university medical center (time post stroke mean = 6.6 years, range 1–13 years). Two were female and six were male (mean age 57.5, range 50–71). All participants had CT and/or MRI scans that verified left hemispheric site of lesion. The Western Aphasia Battery classified the participants accordingly: four Broca’s, one Wernicke’s, one conduction, one global and one with anomic aphasia. Each was invited to participate when they failed to name all of the 30 pictures in a confrontation naming task and were therefore, candidates for using cuing strategies to improve naming responses.

Procedures

Two versions of The Pyramids and Palm Trees test (Howard & Patterson, 1992) were administered. This test provided a measure of object semantics in the all picture version (non-lexical) and lexical semantics in the all word version. Subjects were shown 30 pictures from The Reading Comprehension Battery of Aphasia (LaPointe & Horner, 1979) and asked to name each picture under three conditions: (1) on confrontation, (2) while writing, and (3) while drawing the picture for a total of 90 naming responses. After establishing a confrontation naming score, each picture was shown briefly and participants were asked to name the object while either writing the name of the object or drawing it. Each response was transcribed and classified.

The classification of each naming response was derived from Martin, Dell, Safran, and Schwartz (1994). The classification of errors was as follows: 1. Correct. 2. Semantically related to the target (semantic paraphasias). 3. Semantically related description: description of the object with no attempt to name. 4. Unrelated-lexical error: responses that are unrelated to the target phonologically or semantically. 5. Phonologically related to the target (formal paraphasias): word or non-word errors with <50% of the sounds in the word transposed. 6. Neologisms: non-lexical errors. 7. Perseverations: previous response inappropriately repeated. 8. No response.

Results

Table 1 displays the distribution of naming errors for the eight participants under each condition. A Chi Square was performed and yielded a significant difference in the distribution of errors between the drawing and writing conditions ($p < .0002$). Although drawing did not significantly improve accurate naming compared to confrontation, as a strategy it produced fewer “no responses” and higher semantically related responses than writing. Self-cuing by writing diminished verbal
responses, 74% of errors under the writing condition were “no responses” compared to 39% under the drawing condition. Likewise, semantically related errors were distinct in distribution with 19% under the drawing condition and 7% under the writing condition. Drawing errors were therefore fewer in number and “smarter” in that they were closer to the target than those produced under the writing condition.

Conclusions

We propose that drawing may improve communication for some individuals with aphasia by offering an alternative route to accessing the semantic system. The semantic system is thought to have access to object knowledge from representations of meaning at the structural, perceptual, and associative stages. This information is matched to the stored knowledge of the object and ultimately activates the phonological representations for its name.

Drawing, a strategy that is readily accessible to most individuals with aphasia, may facilitate access to perceptual, and structural knowledge that increases the likelihood of matching the correct lexical-semantic specification. Hence, teaching individuals with aphasia to utilize drawing to facilitate verbal responses may be more beneficial than writing.

References


