On the Role of Orthographic Working Memory in a Case of Isolated Agraphia

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Introduction

Pure agraphia was reportedly related to a functional lesion in the orthographic working memory (OWM), a component of cognitive neuropsychological models of lexical processing (Cantagallo & Bonazzi, 1996, Caramazza, Miceli, Villa & Romani, 1987, Posteraro, Zinelli, & Mazzocchi, 1988). Theoretically motivated studies of pure agraphia were mostly about Italian (or one French case) aphasics who had displayed symptoms of dysgraphia. Like French, but unlike Italian, English has an opaque orthography. Clinical data from users of diverse writing systems will enable researchers to test the universality of cognitive models of writing and reading. The objectives of the current study were 1) to report a case of isolated agraphia whose native language was English, and 2) to discuss the agraphic errors in the context of previous cognitive neurological studies of dysgraphias.

Method

Subject. PP, a 65-year-old female with a history of stroke induced lesion in the left temporoparietal regions (see Figure 1), and conduction aphasia, served as the subject of this study.

Procedure. The present study used two test batteries: 1) Boston Naming Test, and 2) The John Hopkins Dysgraphia Battery (Goodman & Caramazza, 1986). The Boston Naming Test (BNT) is a test that targets picture naming ability of subjects. It consists of sixty stimulus pictures that represent names of high, mid, and low frequency of occurrence. The Johns Hopkins University Dysgraphia Battery (JHUBD) consists of several subtests that assess the cognitive processes (lexical, post-lexical and sub-lexical) underlying graphic performance at word level. Five subtests that were utilized in the present study include: 1) Concreteness, 2) Parts of speech, 3) Word length, 4) written naming, and 5) Copy transcoding.

Results and Conclusion

PP performed at 80% accuracy level in naming a total of 60 pictures of BNT. Her error patterns included both phonemic and semantic paraphasias. In picture naming, PP received few stimulus cues and phonemic cues. PP's scores on five subtests of JHUBD are as follows: 1) written naming: 3.9% (2/51), 2) word length: 0% (0/70), 3) concreteness: 0% (0/42), 4) parts of speech: 0% (0/138), and 5) copy transcoding: 100% (62/62). PP's error patterns included large number of partial responses that included the first letter of the target word and graphemes that are not part of the target word. PP also produced several phonologically implausible non-words. These error patterns seem to suggest that PP's functional lesion must be in the orthographic working memory (Caramazza et al, 1987).
References

