Self-paced reading Stroop-interference effects in Persons With Aphasia

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Introduction

Cognitive impairments have been proposed to subtend the language impairment of in persons with aphasia (PWA) and there is considerable evidence that attentional deficits are impaired in these individuals. Recent research in “executive attention” has brought a focus to this discussion. For example, Lim, et al (2012) recently explored goal maintenance and conflict resolution deficits on a lexical-semantic task in PWA, using a picture-word interference task.

The goal of this study was to examine the ability of PWA and normal controls to resolve linguistic conflicts using a novel, non-spoken, self-paced sentence-reading Stroop paradigm.

Methods

Twenty-nine normal individuals (NI) and 25 persons with aphasia (PWA) completed three modified reading versions of the Computerized Revised Token Test-Reading (CRTT-R). In the condition the color word were printed in black font and the participants read the sentence and then carried out the imperative command at the end of the sentence. In a Neutral condition the color word was replaced with a colored polygon. In an Incongruent (Stroop) condition the color word in the sentences was printed in a font color that differed from lexical item (e.g. the word black printed in red font). Color word reading times served as the dependent variable.

Results

Conflict Resolution. As shown in Figure 1, participants took significantly longer time reading the incongruent words than the control words (p<0.001). Control participants showed an over-additive RT effect compared to PWA in the incongruent condition.

Automatic Lexical processing vs. interference effect. Both groups demonstrated more automatic reading (faster RT on the Fade than the incongruent condition) revealing large interference effects. Post hoc inspection of the data revealed that while the PWA demonstrated slower RTs in all conditions, participants in both groups with slower RTs evidenced a smaller interference effect.

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Discussion

The results indicated that a “Stroop” interference effect was demonstrated under the CRTT-R test format using self-paced reading times. Unlike most Stroop-like tasks, the CRTT-R does not require a verbal response and the task accuracy is indexed off-line using an object manipulation response. Significant interference effects (the “Stroop-Effect”) was present for both group as evidence by slower reading times on the Incongruent compared to the Fade condition.

Unexpectedly, the control group produced a significantly greater interference effects than PWA. This unexpected result is consistent with the finding that slower readers from both groups produced smaller interference effects. We postulate that this occurs because when otherwise automatic (pre-potent) word reading unfolds more slowly, it reduces the degree of inhibition required under fast/automatic reading. That is, slowed response selection, the putative locus of the Stroop effect, may have reduced the competition and inhibition required among selection candidates.

References