Verb-Based Facilitation of Argument Processing in Agrammatic Aphasia: Evidence from Eyetracking

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Introduction

Healthy individuals use verb meaning (e.g., selectional restrictions) to facilitate argument processing (Altmann & Kamide, 1999). Previous studies on agrammatic aphasia have revealed subtle deficits in processing selectional restrictions (Dickey & Warren, 2012; Myers & Blumstein, 2005). The present study tested whether agrammatic aphasic individuals show verb-based facilitation of argument processing.

Method

Seven people with agrammatic aphasia and eight age-matched controls participated in the experiment. As their eye movements were recorded, participants viewed arrays of four drawings of objects (e.g., jar, plate, stick, pencil) and listened to sentences containing either a restrictive verb that selected only the target object or an unrestricted verb that selected all four objects (e.g., Tomorrow Amy will open (restrictive)/break (unrestrictive) the jar). Participants then performed a word-picture verification task.

Results

Accuracy did not differ significantly across groups. Eye movement data (Figure 1) revealed evidence of verb-based facilitation in both groups, accompanied by a general slowing of lexical processing in the aphasic group. There were no significant effects during the verb. During the noun, restrictive trials elicited more target fixations than unrestricted trials ($F(1, 13) = 12.502, p < .01$); this effect was significant in the aphasic group ($p < .05$) and approached significance in the control group ($p = .057$). In addition, controls made more target fixations during the noun than aphasic participants, reflecting slowed lexical processing in the aphasic group ($F(1, 13): 8.874, p < .05$). In the 400 ms following sentence offset ($S400$ region), there was an interaction between group and condition ($F(1, 13): 12.084, p < .01$), with aphasic participants ($p < .01$), but not controls ($p > .1$), making more target fixations in restrictive than unrestricted trials. There were no significant effects in the following 400 ms time window ($S800$ region).

Discussion

Like controls, aphasic participants made rapid use of verb meaning to facilitate processing of the following noun, despite previous reports of subtle deficits in selectional restriction processing (Dickey & Warren, 2012; Myers & Blumstein, 2005). In addition, aphasic participants exhibited slowed processing of the noun, consistent with previous studies that demonstrated a general slowdown of lexical processing (Love, Swinney, Walenski, & Zurif, 2008; Thompson & Choy, 2009).

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References


**Figure 1.** Proportion of fixations to target picture across groups, conditions, and sentence regions