Space reference and event processing in aphasia : Evidence from English and French
How deep are language effects and can they guide visual processing and similarity judgments ?

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One of the most controversial issues in aphasia research is whether performance depends solely on syndrome-related factors or also on language-specific constraints and how deep the influence of these factors is. The wide spread idea that there is a selective vulnerability at the level of morphological and syntactic processing in non-fluent agrammatic aphasia (ie. the Closed-Class theory of Agrammatism [1]) irrespective language background, has been questioned by many crosslinguistic studies [2-4] in recent years. Researchers show that the 'same' aphasic syndromes look very different from one language to another. For instance, although grammatical inflections, function words and syntactic processing are found largely vulnerable in the agrammatic discourse, the degree and the nature of this impairment vary greatly from one language to another [5]. In the domain of motion events, languages strongly vary in their morphosyntactic distribution thus constraining verbalization options [6]: some (mostly Romance languages such as French) invite speakers to lexicalize in verbs mainly Path information leaving Manner omitted or expressed peripherally or periphrastically; whereas others (Germanic languages such as English) invite them to lexicalize Manner in verbs and express Path with particles or with other function words. The question of whether such linguistic differences have deeper effects at the level of cognitive processing (e.g., visual attention, categorization) has recently become of great interest for aphasia research and more specifically for the study of the role typological (language-related) vs. language-independent (universal/syndrome-related) factors play [7].

The influence of spatial language properties on offline (production) and online (overt attention and categorization) behavior was tested in three eye-tracking studies. More specifically, the performance of two speakers with agrammatism (SWA), one English and one French, was compared to the performance of 20 English and 20 French controls in three experiments coupled with an eye-tracking paradigm: (1) a Non-Verbal similarity judgment task; (2) a 'Verbal' similarity judgment (sentence-contamination) task; and (3) a Production task. In the non-verbal categorization participants first saw a target video showing a motion event performed in a certain *Manner* and along a certain *Path*. The target was then followed by two other videos, variants of the target that differed from it with respect either to *Manner* or to *Path*. Participants had to choose the variant that looked most like the target and to press a key as fast as they could to indicate their choice. The verbal categorization task was exactly the same, except that the target video was replaced by a sentence (verbal contamination). The crucial question was what participants choose and look at while categorizing motion scenes (with no verbal input) and while listening to a pre-specified target sentence (with verbal contamination). If language-specific constraints influence speakers' general conceptual processing then, irrespective condition, participants should look at features of the event that correspond to the most salient (from a typological perspective) target-feature (Manner/Path) component and follow the spatial constraints of their language. The data show that when participants hear a target sentence (e.g., Experiment 2) they shift overt attention significantly more to language-specific components (e.g., Path fixations in French) than to other (peripheral for them) features of the event, but when the verbal contamination is not explicitly presented in speech (Experiment 1), overt attention to specific components did not differ in all measures, although all speakers showed signifiant preference for the typological constraints of their language in verbalization (Experiment 3). This suggests that although language-specific features do influence eye-gaze behavior, they do so only partially and especially when the task involves explicit linguistic processing.

Keywords : Agrammatic aphasia, Attention, Eye movements, Linguistic constraints, Motion events, Similarity judgments

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