How (and when) does sentence comprehension go wrong in agrammatic primary progressive aphasia?

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Primary progressive aphasia (PPA) is a degenerative disease affecting language while leaving other cognitive facilities relatively unscathed (Mesulam et al., 2012. The logopenic subtype of PPA (PPA-L) is characterized by impaired repetition, naming, and word finding, whereas the agrammatic subtype of PPA (PPA-G) is characterized by agrammatic language production with impaired comprehension of non-canonical syntactic structures, but spared single word comprehension (Gorno-Tempini et al., 2011).

Non-canonically ordered sentences subvert the dominant agent-verb-theme order of arguments in English, such that the theme precedes the verb. For example, in an object relative clause (The boy that the girl saw [gap] is …), the theme argument (boy) is extracted from the [gap] position, preceding its verb (saw) and the agent argument (girl). In a subject relative clause (The girl that [gap] saw the boy is …), the dominant agent-verb-theme order is preserved.

One account of this agrammatic pattern is that comprehension of non-canonical structures is impaired due to a deficit at thematic integration of a verb with its arguments (Thompson and Choy, 2009). We examined this hypothesis in the agrammatic and logopenic subtypes of primary progressive aphasia using a visual world eye-tracking paradigm with auditory sentence presentation. Deficient thematic integration predicts on-time but abnormal eye-movements to structural gaps in object-relative sentences, particularly for agrammatic PPA.

The results indicate on-time but abnormal gap processing for participants with agrammatic PPA in sentences with object-relative clauses. We argue that these results are consistent with the hypothesis that agrammatic comprehension deficits in PPA reflect impaired thematic integration.