The time course of sentence planning and production in two Australian free word order languages

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Australian Indigenous languages are well-known for having highly flexible word order, and while this and other properties have been central to debates in linguistics [1,2], there is virtually no psycholinguistic data from these languages. In this paper we present the results from two eye-tracking studies that investigated sentence planning and production in Murrinhpatha (non-Pama-Nyungan, Southern Daly) and Pitjantjatjara (Pama-Nyungan, Western Desert language), two unrelated free word order languages. We ask: (i) what influences the production of different word orders, and (ii) how does speaking a free word order language influence sentence planning?

While both Murrinhpatha and Pitjantjatjara have been described as having flexible word order, they differ significantly on several relevant typological dimensions. Notably, Murrinhpatha is polysynthetic and head-marking, containing only vestigial dependent marking via the optional use of ergative marking in some contexts [3-5]. In contrast, Pitjantjatjara is ergative and dependent-marking, with no verbal agreement morphology [6].

Native speakers of both languages (Murrinhpatha, N=43; Pitjantjatjara, N=49) completed a picture description task while their eye-movements were recorded. Our method closely followed Norcliffe et al. (2015). There were 48 target pictures that depicted two-participant events (e.g., a crocodile biting a man), which were manipulated for agent and patient humanness (+/- human). The target pictures were interspersed amongst 93 filler pictures, which mostly depicted intransitive events. The resulting picture descriptions were transcribed and coded for word order, and participants' eye movements were analyzed using multilevel logistic regression [8-10].

The results show that, consistent with the suggestion that the languages are free word order, participants from both languages produced all possible orderings of S, O and V in the experimental corpus and no word order occurred more than 50% of the time. As in past studies [7, 11-13], differences in word order were sensitive to the different configurations of Agent and Patient humanness. Specifically, the humanness of patients plays an important role in A-initial sentences. In contrast, human agents were more likely to condition P-initial and V-initial sentences, but in interaction with P humanness. Our analyses of the eye-movement data suggest that sentence planning in these languages is best described as a weakly hierarchical process [14, 15], with no evidence to suggest that bottom-up perceptual cues drive word order selection[1]. Notably, the results suggest that speaking a free word order language results in a rather different pattern of sentence formulation than in languages with fixed word orders: speakers' gaze was more evenly distributed across the two characters, providing evidence of very early relational encoding during event apprehension that differed across A-initial and P-initial word orders. This result suggests that Murrinhpatha and Pitjantjatjara speakers lay down a very early conceptual representation of the event, which guides their subsequent linguistic encoding and production (see Figure 1). This pattern of early relational encoding is consistent across the two languages, despite their typological differences, although some differences emerged during linguistic encoding which may be attributable to differences between the languages.

Our results suggest that sentence planning is significantly affected by typological properties such as free word order and support the growing body of research revealing significant cross-linguistic differences in sentence production that are linked to grammatical properties of languages.

[1] cf. Gleitman et al., 2007 [16]

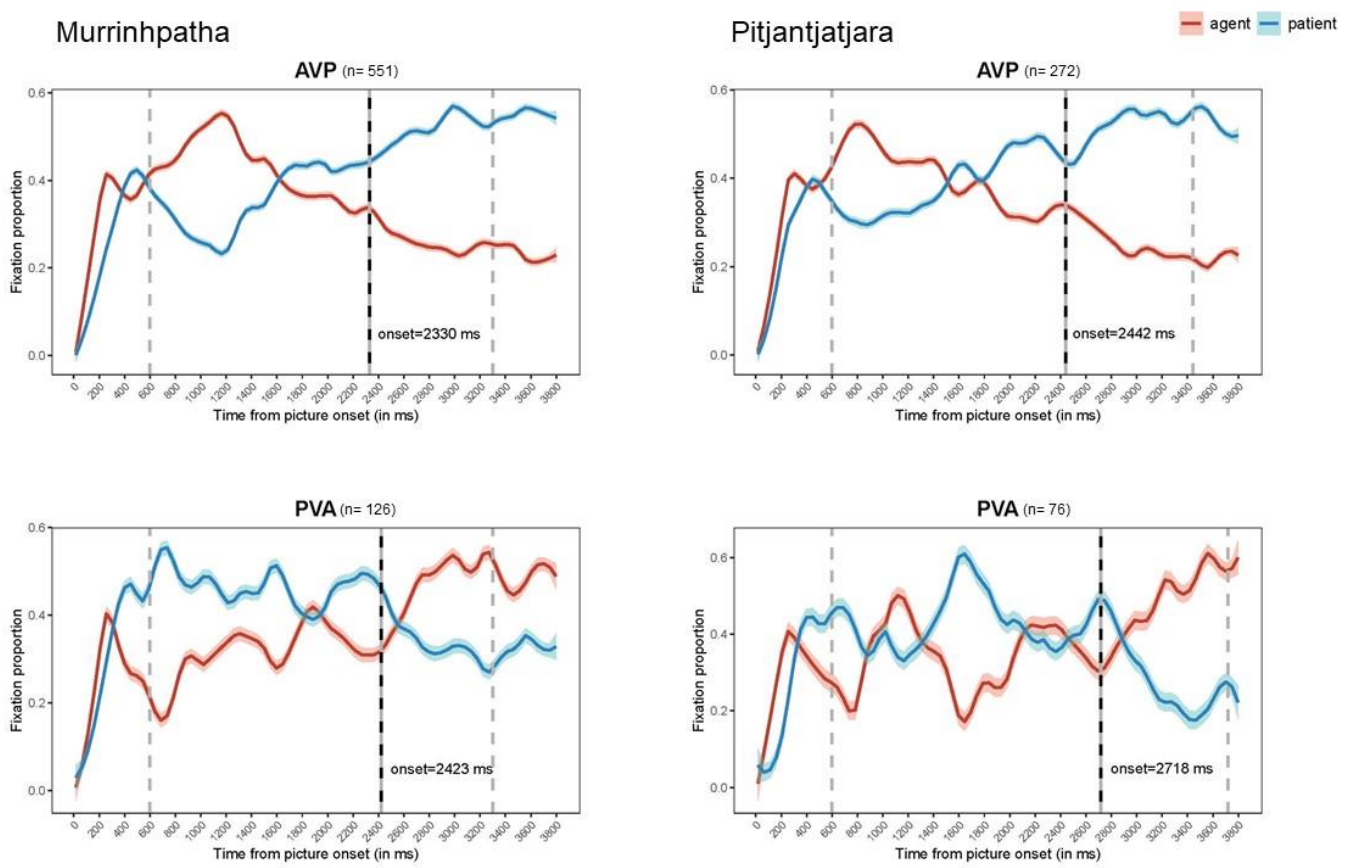

Figure 1. Proportion of agent- and patient- directed fixations in AVP and PVA sentences in Murrinhpatha and Pitjantjatjara after smoothing with LOESS method (span at 0.01). Ribbons indicate standard errors; dashed lines indicate analysis time windows.

References

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