Does information availability affect order of mention and structure choice?

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Speakers can plan sentences in large conceptual chunks or in smaller, word-sized units. For example, a sentence like “The nurse is kicking the fireman” can be planned by generating a larger message including information about both event characters and the relationship between them (kick, nurse, fireman), or by activating concepts sequentially, with direct consequences for syntactic encoding during the formulation phase (e.g., in English, patient-first sentences require passive syntax or non-canonical active syntax). Both encoding strategies have been investigated in event scene description tasks across different languages, showing different degrees of reliance on linear encoding [1], [2], [3].

The current study tested whether manipulating the sequential availability of visual scene information (agents vs. patients) influences speakers’ planning strategies and whether these strategies vary across typologically different languages. Visual scenes were presented in two steps: one of the event characters was presented alone first, followed by presentation of the entire scene. Four languages were selected for comparison, primarily with respect to the availability of syntactic choices for describing two-participant events (in descending order: Russian > German > Chinese > English[4], [5]). Importantly, these languages also differ in the frequency of use of different structural options. For example, patient-first structures are more frequent in English and German than in Chinese and Russian. By comparing the order of character mention in speakers’ scene descriptions, we tested whether these languages would differ in their sensitivity to the experimental manipulation [pre-registration link].

Method: Data are available from 160 native speakers (N=40 in each language). All participants completed the same sentence production task online (programmed in PCIBEX) in their native language. The task required describing 40 target items and 40 fillers, presented in a different randomized order for each participant. Target scenes showed an animate agent acting on an animate patient (e.g., a nurse kicking a fireman; 20 AA items) or on an inanimate patient (e.g., a boy kicking a ball; 20 AI items), and elicited agent-first or patient-first sentences. Filler pictures showed a range of different scenes (intransitive events, non-causative transitive events, and displays of non-interacting objects), and elicited a variety of descriptions. On each trial, brief presentation of either the agent or the patient (300ms) preceded the presentation of the whole scene (agent-preview vs. patient-preview; Figure 1). Participants were instructed to begin speaking as soon as possible. Data collection was unsupervised.

Results: Target event descriptions were scored as beginning with the agent or patient character, and mixed effects logit models with deviation contrast codes were conducted on all transitive sentences (actives, passives, truncated passives; 5000+ total sentences). Speakers preferred to begin sentences with agents rather than patients, especially when describing events with inanimate patients (main effect of Patient Animacy; $p<.001$). Presenting the patient before the entire scene decreased the likelihood of producing agent-first sentences (main effect of Preview; $p<.001$), and this effect was stronger in scenes with animate patients (marginal interaction of Patient Animacy with Preview; $p=.07$). The magnitude of the Preview effect differed across languages (interaction of Preview with Language; $p=.04$).

Conclusions: The sequential availability of scene characters systematically influenced speakers’ syntactic choices across typologically different languages, suggesting that sentence planning can unfold in small, word-sized units (i.e., in a linearly incremental fashion). In addition, the effect of patient animacy on syntactic choice suggests that speakers systematically rely on this feature to determine the suitability of a character to appear in sentence-initial position. Strong modulation of structure choice by animacy is consistent with linearly incremental planning. Finally, cross-linguistic differences in speakers’ sensitivity to the experimental manipulations may be due to the frequency of use of specific syntactic structures rather than the number of syntactic options available within each language. Further analyses will evaluate these findings on the basis of measures of real-time performance (production speed, hesitations, pauses and errors).

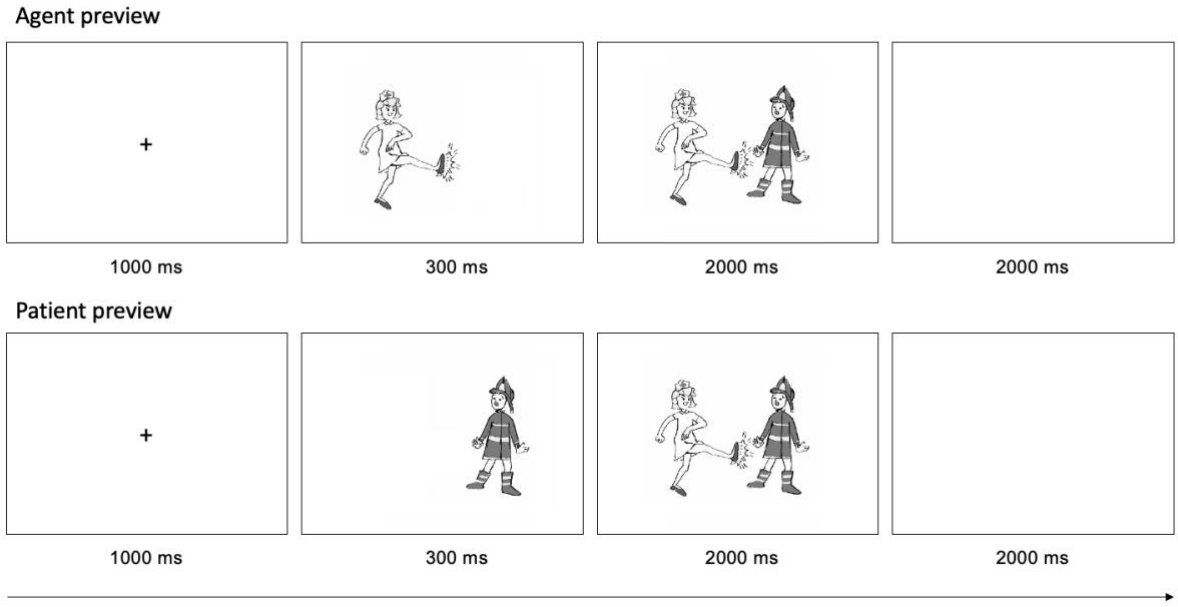

Figure 1. Example of an event with animate agents/animate patients (AA).

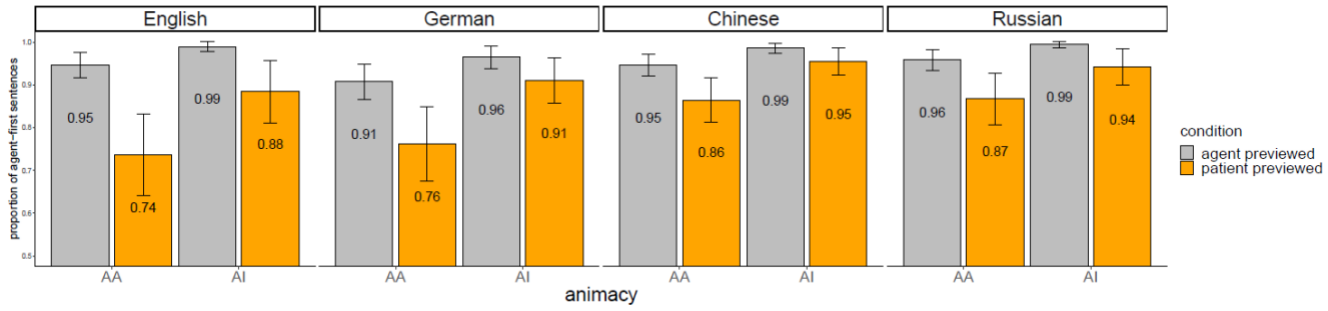

Figure 2. Production of agent-first event descriptions across languages and preview conditions (by-participant means with ±1 SE).

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