Mapping "Easy" and "Hard" Messages onto Language: Conceptual and Structural Variables Jointly Affect the Timecourse of Sentence Formulation

Agnieszka E. Konopka[1,2], Maartje van de Velde[1,3], Antje S. Meyer[1,3]

1. Max Planck Institute for Psycholinguistics, the Netherlands, agnieszka.konopka@mpi.nl
2. Donders Institute for Brain, Cognition, and Behavior, the Netherlands
3. Radboud Universiteit, Nijmegen, the Netherlands

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Sentence formulation requires mapping pre-verbal messages onto linguistic structures. This message-to-language mapping is often evaluated in eye-tracking tasks where speakers describe pictured events (*The dog chased the mailman*). Speakers can begin sentence formulation by quickly selecting the first-fixated character as the sentential starting point (lexical incrementality), or generating a rudimentary sentence plan based on their construal of the event gist before selecting a starting point (hierarchical incrementality; Kuchinsky & Bock, 2010). Lexical incrementality predicts fast divergence of fixations while hierarchical incrementality predicts slower divergence of fixations to the two characters within 200ms of picture onset.

Speakers have some flexibility in their choice of a more lexically or more hierarchically incremental planning strategy (Konopka & Meyer, 2011). Here we tested whether the timecourse of sentence formulation in early (0-200ms) and later time windows (200ms-speech onset) changes with the ease of encoding the event gist (the who-did-what-to-whom event structure) and generating a suitable linguistic structure.

48 eye-tracked speakers described a series of pictures, including 60 two-character target events that elicited descriptions with the preferred active or dispreferred passive construction. In "easier" (more codable) events, the characters performed unambiguous actions (e.g., *hitting*) that were described with a small set of verbs, while "harder" (less codable) events were described with a wider range of verbs depending on speakers' interpretation of the event (e.g., *biting, eating*). The agent and patient characters varied in name agreement. To facilitate production of passives, speakers performed a reading task that included a high number of passive sentences mid-way through the experiment.

Event codability influenced early formulation of active sentences (0-200ms): fixations to the two characters diverged more slowly in "easier" than "harder" events, and were only weakly modulated by the ease of encoding the first-mentioned character. In harder events, speakers directed their gaze to the agent verys quickly if it was easy to name and more slowly if it was difficult to name. Thus speakers selected starting points based on early encoding of event gist in "easy" events (hierarchical incrementality) and based on properties of the first-mentioned character in "harder" events (lexical incrementality).

Early formulation of passives was influenced by the ease of assembling a passive structure. Speakers looked first at the *agent* when producing passives before the reading task, but directed more fixations to the *patient* and produced more passives after the reading task (structural priming). This provides the first evidence that priming a dispreferred structure influences gaze during selection of a starting point. In later time windows (200ms-speech onset), speakers fixated characters in the order of mention in "easier" events, but gaze patterns were less consistent in "harder" events. Thus speakers were more confident that they could continue a sentence from their chosen starting point with dispreferred syntax when they encoded the event gist quickly.

References

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