

Does message similarity facilitate sentence formulation?

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The generation of an utterance begins with event apprehension and continues with sequential linguistic encoding of all message elements [2]. The timecourse of formulation, however, is relatively flexible and varies with the ease of structural encoding [3]. While previous work has shown that syntactic structure may be primed independently of thematic roles across sentences [1], here we tested whether exposure to conceptually similar events interacts with structural processes to facilitate the mapping of a message onto a sentence.

Young adult native Dutch speakers ($n=41$) performed an eye-tracked picture description task with 36 prime-target picture pairs embedded in a list of 160 filler pictures. On target trials, participants described pictures of transitive events (e.g., a dog chasing a mailman). On prime trials, they saw pictures where the action was related or unrelated to the action in the targets and heard a recorded active or passive description (The paparazzi is *following* / *photographing* the queen; The queen is being *followed* / *photographed* by the paparazzi) that they had to repeat out loud. The similarity of prime and target events at the conceptual level and lexical level was confirmed with norming (perceptual similarity of related and unrelated picture pairs was held constant). The structural manipulation served to test the joint effects of similarity in conceptual structure and linguistic structure on sentence formulation. We predicted effects of the structural primes (a) on the form of target descriptions particularly when target events were similar to prime events, and (b) on eye movements (fixations to the agent and patient), (c) even in the absence of behavioral structural priming.

As expected, (a) the structural primes influenced the form of target sentences (structural priming), and priming effects were larger between primes and targets with related than unrelated verbs (the semantic boost in structural priming). Timecourse analyses of the eye movements (performed with quasi-logistic regressions and growth curve analyses; GCA) tested at what stage event similarity influenced formulation.

Event Similarity: Event similarity did not influence early eye-movements (i.e., event apprehension, 0-400ms after picture onset), but predicted when speakers deployed attention to the subject character after 400ms. In active sentences, (b) speakers looked briefly at the patient between 400 and 700 ms before re-directing their gaze to the agent; this shift of gaze was less pronounced after related than unrelated prime events, suggesting that speakers found it easier to continue encoding the sentence when describing similar events.

Event Similarity and Structural Priming: After 700 ms, shifts of gaze to the agent in active sentences occurred more quickly after active than passive primes with related verbs, indicating earlier encoding of this character when formulation was supported by a recently used linguistic structure. When producing the dispreferred passive structure, speakers also directed more looks to the patient after passive primes than active primes (GCA), particularly when prime events were related to the targets. Event similarity and Prime structure impacted formulation even when speakers were not behaviorally primed (e.g., produced an active sentence following a passive prime): (c) fixations to the patient tended to be more peaked and shifted earlier after passive primes, and again this effect was larger after exposure to related prime events.

Thus eye movements revealed that message similarity and structural priming can affect formulation for preferred and dispreferred syntactic structures alike and even in the absence of behavioral priming. These effects were observed throughout the linguistic formulation process (from 400 ms onwards), suggesting a tight link between the ease of message formulation and the mapping of this message onto a linguistic structure.

References

- [1] Chang, Bock, & Goldberg (2003), *Cognition*, 90, 29-49.
- [2] Griffin & Bock (2000), *Psych.Science*, 11, 274-279.
- [3] Konopka & Meyer (2011), *AMLaP*, Paris, France.