Planning a sentence, such as the description of a two-character event (The dog is chasing the mailman), may begin with the retrieval of either character’s name (dog, mailman) or the generation of a sentence frame. Lexicalist and structuralist approaches to sentence production postulate heavier reliance on words and structures, respectively, in early sentence formulation. To evaluate how these two types of information influence gaze patterns and structure selection, we compared the time-course of sentence planning when the names of the event characters were primed (Experiment 1) and when sentence structure was primed (Experiment 2).

In both experiments, prime and target pictures were embedded in a list of filler pictures. On prime trials speakers heard a sentence that they repeated out loud; on target trials they described pictures of two-character events. In Experiment 1, the primes showed one-character events where the character was semantically related to the agent, patient, or to neither character in the following target picture (e.g., wolf, salesman, umbrella). In Experiment 2, prime pictures showed two-character events accompanied by an active or passive sentence, or a two-character intransitive sentence that served as a neutral prime (e.g., The couple are rollerskating). The effectiveness of these primes was evaluated by comparing a) the proportion of actives and passives produced on target trials, b) the relationship between first fixations to the two characters and sentence structure, and c) the pattern of fixations to these characters over time.

First, lexical priming in Experiment 1 did not influence sentence structure: speakers produced active and passive sentences at similar rates following agent-related and patient-related primes. In contrast, in Experiment 2, passive primes increased the proportion of passive sentences on target trials, demonstrating a stronger influence on structure choice than lexical primes.

Second, first fixations predicted sentence structure only in Experiment 1: speakers produced more actives if they looked first at the agent and more passives if they looked first at the patient. This pattern did not vary across conditions, as lexical primes did not bias speakers to put cued characters in subject position. In contrast, in Experiment 2, the structural primes modulated the likelihood of beginning sentences with the first-fixated character: early fixations to the patient resulted in more passive sentences when passive syntax was primed.

Finally, time-course analyses showed a change in gaze to the agent and patient only in Experiment 2 in active sentences (gaze patterns for passives sentences were not stable enough to draw strong conclusions). In Experiment 1, fixations to the agent and patient diverged quickly after picture onset in all conditions, indicating rapid selection of a sentential starting point [2]. In Experiment 2, there was a smaller preference to look early at the agent when speakers had first repeated an active prime than a passive prime, suggesting more structural planning before selecting a starting point in this condition [1]. These results are the first to demonstrate effects of using primed structures on the early stages of sentence formulation.