

LISTENING TO DISFLUENT SPEECH INFLUENCES SENTENCE PLANNING

Agnieszka Konopka, Eunice Fernandes, Izabela Todorova, & Boryana Elenkova
(agnieszka.konopka@abdn.ac.uk, University of Aberdeen)

Production processes are sensitive to recent linguistic experience. In a typical experiment, speakers listen to recorded speech (or to the speech of a conversational partner) on some trials and then perform an assigned production task on other trials. Changes in the outcome of production processes (as well as in their time-course) after different types of input are interpreted as showing implicit, experience-driven adaptation. However, a limitation of many studies is that this input normally consists of *fluent* and *error-free* speech, which is unlike the type of speech we experience outside of the lab (i.e., speech with hesitations, corrections, etc. [1]). This study tested how exposure to fluent and disfluent speech shapes sentence planning in native (L1) and non-native (L2) speakers. While the time-course of L1 planning can be influenced by the ease of executing individual production processes by the speaker [2], it is unclear if planning strategies also change in response to properties of another person's speech. If participants are sensitive to production difficulties shown by a speaker engaged in a similar task [3], their own planning strategies may show strategic shifts in encoding priorities. We compared these shifts across L1 and L2 speakers to test how adaptation and flexibility in sentence planning vary with linguistic proficiency.

Experiment: 24 (out of 48 to be tested) eye-tracked L1 and L2 English speakers took part. Proficiency was assessed with a questionnaire and vocabulary test. Participants saw a list of 42 prime-target picture pairs interleaved among 130 fillers. Each trial was preceded by a prompt asking participants to either listen to a recorded active-voice description of the picture (allegedly produced by another "participant") or to produce a description themselves. On prime trials, the recorded descriptions were fluent (e.g., *The baker is making bread*) or included a disfluency and correction on the agent or patient character (*The cook... uh no, the baker is making bread; The baker is making cake... uh no, bread*). Targets featured unrelated, two-character transitive events and had to be described spontaneously.

Preliminary results: Both L1 and L2 participants produced 94% active sentences on target trials (751 out of 796 scorable sentences). The distribution and lexical content of these sentences did not vary across conditions.

To assess planning strategies, Growth Curve Analyses were carried out on agent-directed fixations across conditions before speech onset (0-500, 500-2000 ms). In the fluent condition, L1 participants engaged in radically incremental, "opportunistic", word-by-word planning [3] (Figure 1, 2): they showed a strong preference for fixating the agent after picture onset and continued fixating this character until speech onset. This early agent preference was weaker in *both* disfluent conditions: participants were more likely to fixate both the agent and the patient before 500 ms, and then began directing their gaze to the agent. Thus, there was a shift away from "opportunistic" word-by-word planning and towards prioritizing early encoding of event gist (message-level encoding) before beginning lexical retrieval of the agent name (linguistic encoding after 500 ms), irrespective of the location of the disfluency in the primes. In contrast, L2 participants showed less sensitivity to the disfluency manipulation as they fixated the agent with priority before 500 ms in all conditions. After 500 ms, they directed their gaze to the agent *more quickly* after disfluent than fluent primes (interactions between Language, Fluency, and the Linear, Quadratic and Cubic time terms; all $t_s > 2.2$).

Preliminary conclusions: Following exposure to disfluent speech, L1 participants engaged in less "opportunistic" planning, even in the absence of direct interaction with the disfluent speaker. Immediate modulation of *early* planning by all disfluencies in another person's speech suggests a strategic preference to engage in extensive message-level planning in a context where another speaker showed production difficulty (possibly to avoid being disfluent oneself) [2]. An analogous early shift was not observed in L2 participants, as the high costs of L2 production may reduce flexibility and the potential for immediate online adaptation. The results identify boundary conditions on adaptation that are relevant both for theory-building and for the generalizability of lab results to language processing "in the wild".

[1] FoxTree, 1995; [2] Konopka & Meyer, 2014; [3] Arnold et al., 2003

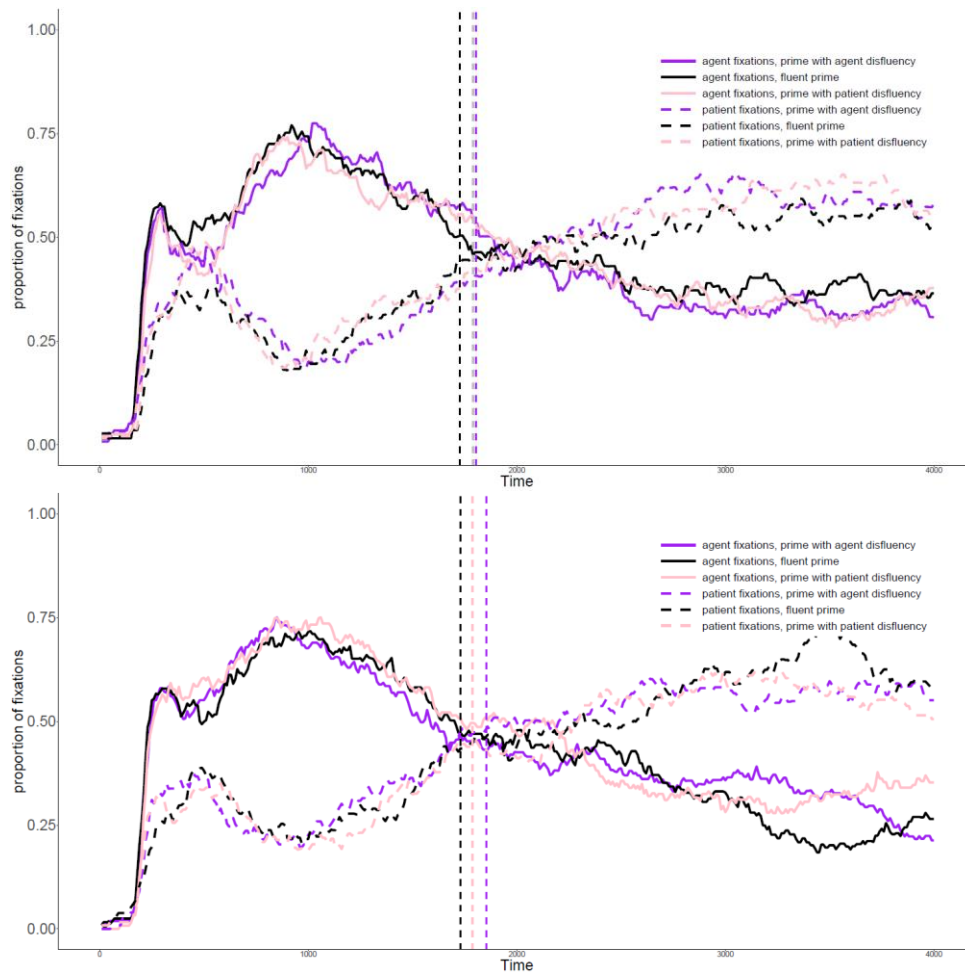


Figure 1. Agent-directed and patient-directed fixations (0-4000 ms) during production of active target sentences by L1 participants (top) and L2 participants (bottom) across conditions (vertical lines represent speech onsets).

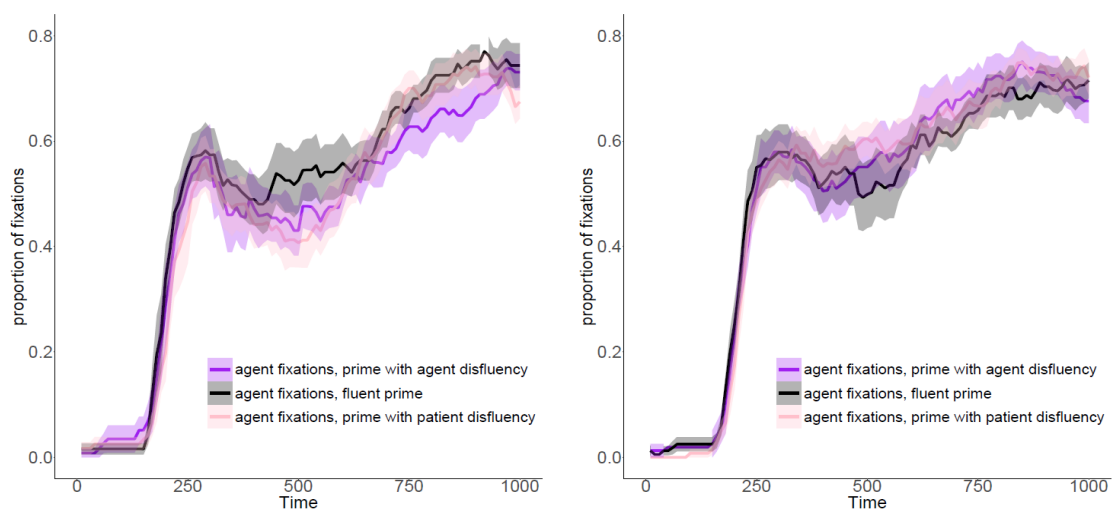


Figure 2. Agent-directed fixations plotted separately for clarity with SEs in a representative 0-1000 ms time window for L1 participants (left) and L2 participants (right) across conditions.