

## HOW STRONG IS GAZE AGAINST THE RECENT EVENT PREFERENCE?

Eye-tracking evidence shows that people prefer to inspect the target of a recently-depicted event vs. that of a possible future event while comprehending a spoken sentence describing the recent or future event. Moreover, this preference appears to persist even when during the experiment future events are shown and referenced to more often than past events.

In two visual world studies ( $N=32$  each), we tested the recent event preference against a situational cue, which has been found to be highly effective in guiding visual attention, i.e. gaze (Hanna & Brennan, 2007; Knoeferle & Kreysa, 2012). Participants saw the experimenter sitting at a table with two objects on either side (e.g., pancakes/strawberries). After seeing the experimenter perform an event (sugaring strawberries) participants listened to an NP1-VERB-ADV-NP2 German sentence, in the past (*lit.* 'The experimenter sugared recently the strawberries') or in the present tense with a future meaning ('The experimenter sugars next the pancakes'). During the verb (Expt 1) or at verb onset (Expt 2) the experimenter either shifted the gaze towards the object that would be named in the sentence (NP2), or looked straight ahead. After the sentence participants saw the experimenter performed the 'future' action. Thus the design was 2 (object: recent vs. future) x 2 (tense: past vs. future) x 2 (gaze: gaze vs. no-gaze).

We analyzed participants' eye fixations to the two objects in the display (pancakes/strawberries) while processing the sentence using mean log-ratio gaze probabilities ( $\ln(p(\text{recent object})/p(\text{future object}))$ ). Fig. 1 plots these probabilities in 20ms slots from Verb onset for Expt 2 (Critical regions: VERB-ADV-NP2). Fig.1 shows that gaze affected in particular looks to the recent object in the early VERB region. ANOVAs on mean log-ratios for each region gave similar results for both experiments, i.e. a tense effect in all regions and a gaze effect in the VERB region. However, crucially, in the VERB region there was a gaze by tense interaction: contrasts showed that gaze (vs. no-gaze) enhanced looks to the future object ( $p < .001$ ), but not to the recent object. Importantly, we observed an overall preference for the recent object up to the last region irrespective of gaze and tense. Therefore, as expected, gaze acted rapidly in directing attention to the future object, thus mitigating the recent event preference. However, as in previous research, there was still an overall recent object preference until sentence end. This was corroborated by results of a post-experiment gated memory test (Expt 2), which showed a trend for better memory for recent objects but no effect of gaze. We propose that what underlies the recent event preference is a deeply ingrained epistemic bias of the human mind that favors assertions about past events over future ones.

Fig. 1 Mean log gaze probability ratios ( $\ln(P(\text{recent target})/P(\text{future target}))$ ) as a function of conditions from Verb onset for Experiments 1 and 2

