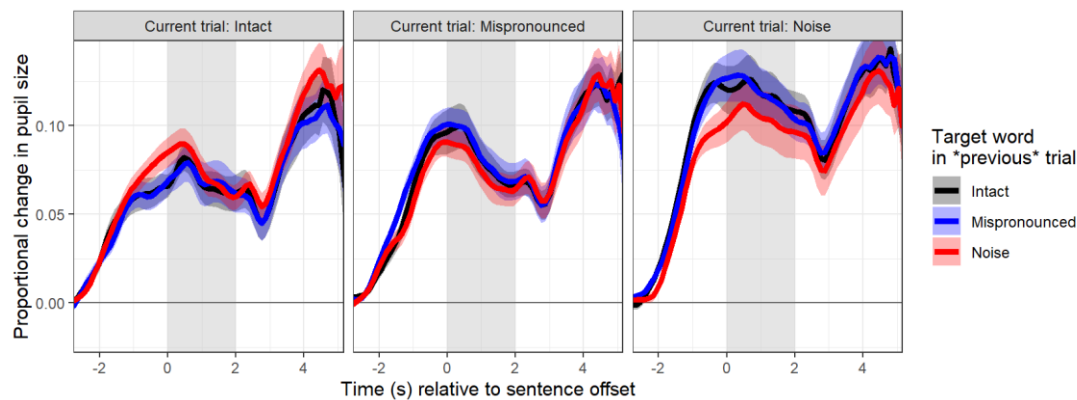


Supplementary Material I

On the effect of stimulus condition in the previous trial

Experiment 1 featured 3 stimulus conditions that were pseudo-randomized between trials. A follow-up analysis was conducted to determine the effect on the pupil dilation response related to the stimulus type from the previous trial. The first trial of each block was discarded since it was predictably an Intact stimulus.

There were two main results. First, Intact sentences elicited slightly higher pupil dilation following sentences with noise-masked target words compared to when it follows either of the other two conditions. This could indicate that the listener is temporarily in a hyper-alert state expecting a difficult trial following a previous difficult trial. The second result was that sentences with noise-masked target words elicited smaller pupil dilation when following sentences that also had noise-masked target words. This implies that some of the pupil response in the noise trials might have resulted from surprise/startle from the noise, since the second of two sequential noise trials elicited smaller dilation, consistent with less surprise. Even though the trial types were not predictable and therefore none should have been “surprising”, the listener’s disposition still might carry over from one trial to the next, as this phenomenon has precedence in the literature. Specifically, Vaden et al. (2013) found that elevated activity in the cingulo-opercular network (associated with error monitoring and adaptive control) was associated with better performance on subsequent trials. In other words, the increased need for cognitive control during a (presumably difficult) trial carried over to benefit the next trial. In the current study, benefit could not be measured in the same way since the stimuli were designed to elicit perfect intelligibility. Nonetheless, there are cross-trial effects that are potentially meaningful.



Reference:

Vaden, Jr., K.I., Kuchinsky, S.E., Cute, S.L., Ahlstrom, J.B., Dubno, J.R., & Eckert, M.A. (2013). The cingulo-opercular network provides word-recognition benefit. *Journal of Neuroscience*, 33(48), 18979–18986. doi: 10.1523/JNEUROSCI.1417-13.2013