

Influence of Speakers' Gaze on Listeners' Comprehension: Evidence from Event Related Potentials (ERP)

Eye-tracking studies have shown that language external cues such as gaze influence listeners' visual attention and affect sentence comprehension (Staudte, 2011). However, little is known about the underlying nature of processing difficulties of contradictory visual and auditory information. We present findings from an ERP study (30 German right-handed participants (18–32)) that utilized a stylized face performing gaze cues time-aligned to an auditory sentence. The sentence described a comparison between two out of three objects present in a visual scene respective to size or brightness differences. The gaze cues preceded the naming of the object by 800ms in order to obtain a natural gaze behavior (Kreysa, 2009). We manipulated the gaze cue toward the second named object in a way such that it was either congruent toward the object, incongruent toward the unnamed object, or neutral toward the bottom of the screen. ERPs time-locked to the onset of the noun following the manipulated gaze cue showed that, compared to the congruent condition, incongruent and neutral gaze cues evoked an early-starting posterior negativity (150ms – 450ms). The incongruent gaze cue additionally induced a late sustained posterior positivity starting around 500ms after noun onset (500ms – 1000ms).

The results highlight that congruent gaze facilitates comprehension, expressed by a reduced negativity (N400), whereas incongruent gaze not only interferes with language processing, as expressed by the modulation of the N400 (e.g.; Kutas, 2011), but additionally enforces an update of the situation build on the preceding visual information expressed by the late positivity (e.g.; Polich, 2009).