

The influence of gaze direction on the comprehension of speech and gesture in triadic communication

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Human face-to-face communication is a multi-modal activity. Recent research has shown that, during comprehension, recipients integrate information from speech with that contained in co-speech gestures (e.g., Kelly et al., 2010). The current studies take this research one step further by investigating the influence of another modality, namely eye gaze, on speech and gesture comprehension, to advance our understanding of language processing in more situated contexts. In spite of the large body of literature on processing of eye gaze, very few studies have investigated its processing in the context of communication (but see, e.g., Staudte & Crocker, 2011 for an exception). In two studies we simulated a triadic communication context in which a speaker alternated their gaze between our participant and another (alleged) participant. Participants thus viewed speech-only or speech + gesture utterances either in the role of addressee (direct gaze) or in the role of unaddressed recipient (averted gaze).

In Study 1, participants (N = 32) viewed video-clips of a speaker producing speech-only (e.g. “she trained the horse”) or speech+gesture utterances conveying complementary information (e.g. “she trained the horse”+WHIPPING gesture). Participants were asked to judge whether a word displayed on screen after each video-clip matched what the speaker said or not. In half of the cases, the word matched a previously uttered word, requiring a “yes” answer. In all other cases, the word matched the meaning of the gesture the actor had performed, thus requiring a

‘no’ answer. Longer responses to gesture-related trials showed that unaddressed recipients did indeed comprehend speakers’ gestures differently to addressees indicating that they might focus more attention on gestures than addressees do, due to not having to split their attention between gesture and gaze.

Study 2 used the same triadic set-up as Study 1. Instead of explicitly focusing participants onto the speech modality (in Study 1 participants judged what was said), it investigated the influence of eye gaze on the speaker’s overall message. Participants viewed speech-only or speech+gesture utterances conveying similar object-related information. Each video-clip was followed by two images of objects, one of which the speaker had referred to in the preceding clip (e.g. “she likes the piano” +PLAYING PIANO gesture; pictures: piano - spoon). Participants’ (N=32) task was to choose the object that best matched the speaker’s message. Reaction times showed that unaddressed recipients responded significantly slower than addressees for speech-only utterances. However, perceiving the same speech accompanied by gestures sped up their responses to a level identical to that of addressees.

These findings show that shifts in speaker’s eye gaze in a triadic communication setting modulate comprehension of speech and gesture. Unaddressed recipients appear to devote greater attention to gesture, and in cases where speech comprehension suffers due to not being addressed, gesture comprehension remains intact and enhances the comprehension of a speaker’s message. This provides first insights into language processing in a multimodal context integrating the influence of three different modalities during comprehension.

References

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