

Gestures accompany new and focused referents in discourse

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How speakers linguistically distinguish between new/given or topical/focused information in discourse is a well-established field of research. What role the visual/gestural parts of language play, however, is less well understood. This study examines *when* speakers use speech-accompanying gestures in the flow of discourse, and if so, *how they use them*. It has previously been suggested that information structure plays a key role (McNeill, 1992). For instance, there is evidence that gesture presence and mode of representation depend on a referent's accessibility (more/less accessible) and/or on how a referent is expressed (lexical noun phrase (NP) vs. pronoun) (Debreslioska, Özyürek, Gullberg & Perniss, 2013; Perniss & Özyürek, 2015; Debreslioska & Gullberg, 2019). As such, speech-accompanying gestures have been considered prominence lending cues which parallel or complement speech (Debreslioska, 2019; Debreslioska & Gullberg, 2020). However, some important information structural dimensions such as 'aboutness' (topic vs. focus elements of the clause) and how they influence gesture use remain largely unexplored. This study therefore examines gestures' sensitivity to 'aboutness', in addition to referent accessibility and referential form, and tests the potential interaction between these variables, in the production of connected discourse.

The data set consisted of 30 videotaped narrative retellings by 10 native speakers of German. We used three short Charlie Chaplin movie clips as stimulus material ('The Lunch Break' extracted from *Modern Times*, 1936; 'The Date' and 'The Good Deed' extracted from *City Lights*, 1931). Participants produced their narrative retellings in a dialogical situation, in which a confederate acted as listener.

For the speech coding, we first divided the narratives into clauses (unified predicates expressing a single situation; Berman & Slobin, 1994). Then we identified all referential expressions, and coded them for form (lexical NP vs. pronoun), referent accessibility (more vs. less accessible), and 'aboutness' (i.e., part of the topic or focus element of the clause). The identification of gestures was carried out in ELAN, a software developed for the frame-to-frame analysis of digital video (Sloetjes & Wittenburg, 2008). We annotated all gesture strokes (i.e., the most meaningful parts of the gestural movements) without the availability of speech in order to guarantee an objective procedure based on the physical features of hand and arm movements. In a second step, the sound was turned back on and we selected those gestures that temporally co-occurred with referential expressions. A gesture counted as co-occurring with a referential expression if the gesture stroke temporally aligned with at least one syllable of the referential expression and did not also co-occur with an additional content word. The selected gestures were categorized as *referential* or *non-referential* (i.e., as representing some property of the referent and/or its actions/movements by way of iconicity/deixis *or not*).

The data were analyzed from three perspectives. Analysis 1 examined how likely different types of referential expressions are accompanied by gestures (IV: referential form, referent accessibility and aboutness; DV: presence/absence of gesture). Analysis 2 took the gestures as starting point and examined how they pattern with the different properties of the referential expressions (IV: referential form, referent accessibility and aboutness; DV: number of gestures). Analysis 3 also took the gestures as starting point and examined gesture referentiality in relation to 'aboutness' (IV: aboutness; DV: gesture referentiality).

Preliminary results for analysis 1 showed that gestures are more likely to occur with lexical NPs and less accessible referents. However, there was no relationship between ‘aboutness’ and the presence/absence of gestures (i.e., speakers are similarly likely to use gestures with topical and focused referents). Analysis 2 showed that more gestures are produced with lexical NPs, less accessible referents, as well as with referents that are part of the focus element of a clause. Analysis 3 showed that *non-referential* gestures associate with topical referents whereas *referential* gestures associate with focused referents. The findings suggest that speech-associated gestures play an important role in the expression of information structure. That is, if we take speech as a starting point, referential form and referent accessibility predict the incidence of gestures. Furthermore, if we start with gestures, that is, if we come across a gesture in discourse, it is highly likely that the co-occurring speech will be part of the focus element of a clause. The findings further highlight the role of information structure for our understanding of gesture functions, namely by showing that ‘aboutness’ can predict *how* gestures will be produced (i.e., whether they are *referential* or *non-referential*).

The study reveals important relationships between speech-accompanying gestures (in terms of their presence and referentiality) and (the expression of) newness and aboutness. Newness and aboutness belong to the set of prominence-related functions (Himmelmann & Primus, 2015), which therefore strengthens the view that gestures might be used as visual prominence lending cues in addition to prominence markers in speech. Further research is needed to clarify in which situations gestures are more likely to be recruited to highlight prominent information and in which situations they tend not to be, perhaps as a function of how many other cues are used in speech. To conclude, the study provides new insights into the integrated nature of speech and gestures and emphasizes the importance of considering gestures in studies of language and discourse.

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