How Common Ground Affects the Use of Gesture Space
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Introduction

Previous work has demonstrated that gesture production is affected by common ground (shared background knowledge). For example, studies have demonstrated that new information gets larger, clearer gestures while unshared information gets smaller, less precise gestures (Gerwings & Baveila, 2004); new information is likely to be expressed in gesture (with or without speech) while shared information is more likely to be expressed in speech alone (Holler & Stevens, 2007); and, in narrative contexts, common ground leads to higher rates of iconic and deictic gestures (both of which are more 'informative' gestures) (Holler & Wilkin, 2009).

Research on the expression of viewpoint in discourse has shown that speakers of English have a systematic way of expressing explicit viewpoint shifts in gesture and other non-verbal behaviors, anchoring them in particular spatial locations (Stec & Sweetser, 2013) and by means of particular framing patterns (Stec, 2012). This suggests that these viewpoints seem to be grounded in ongoing discourse.

In the current study, we build on these findings in two ways. First, we extend the research on common ground to include the expression of viewpoint in gesture. Second, we investigate the relationship between perspective and common ground, measuring its effect on gesture articulation in naturalistic settings.

Based on previous research, we expect that:
- Common ground is tied to perspective, and can be measured via distinct narrative patterns
- As common ground increases, gesture production changes
- In particular, the number of articulators used in each pattern changes

Method

Using a corpus of semi-spontaneous autobiographical narratives told by native speakers of American English, we identified explicit viewpoint shifts (quotative utterances) and, in Study 2, categorized them as being one of three types:

- Same Speaker (SS): maintained viewpoint over multiple sequential quotative utterances with no intervening narrative material
- Dialogue (D): multiple viewpoint shifts over multiple sequential quotative utterances with no intervening narrative material
- Quote Islands (QI): one quotative utterance surrounded by narrative material

We coded each quote for articulator information, noting in particular whether the Hands, Head, Face or Eyes were used during the course of the quotative utterance, and what the total number of moving articulators was. Our analysis either considered multimodal quotatives across the whole narrative (Study 1), or multimodal quotatives in each of these three categories (Study 2).

Study 1: Gesture rates, common ground & time

Previous work suggests that as common ground is established, there should be marked changes in gesture form, e.g., a reduction in gesture form (fewer articulators, less informative gestures, cf. Gerwings & Baveila,2004) and more iconic and deictic gestures (cf. Holler & Wilkin, 2009). Thus, as a narrative continues (and common ground is established), we expect distributional differences of these articulators with respect to quotative type.

We did not find any evidence in our data for the expected pattern, whether looking at quotative use across a narrative (see Insert 1) or successive quotes by the same character within a narrative (see Insert 2). These results suggest that the grounding of perspective is not a property of a story as a whole. However, it is possible that the grounding of perspective is a more local phenomenon which is easily affected by inserted narrative (see Insert 1) or successive quotes by the same character within a narrative (see Insert 2).

Results & Discussion

Study 1 showed that the grounding of perspective is not a property of the conversation as a whole. However, Study 2 showed that there seems to be evidence that articulators distinguish between the placement of quotes if we take perspective to be more of a local phenomenon. This raises an interesting question: What is the relevant feature for the grounding of viewpoint? Does viewpoint stay grounded in the absence of alternative viewpoints? Or is it necessary to ground viewpoint every time it is evoked after intervening language material (that is, is the grounding of perspective a property of a single quote or only stays grounded over multiple adjacent turn constructional units without intervening material)?

If we interpret viewpoint as a purely local phenomenon, we expect SS and QI to group together. In that case only the D set would allow extended grounding of viewpoint. If we look at our corpus this seems to be born out by the data. In the D groups (Dialogue sections) we found that in all groups, articulators are more often absent (A117 to P37). This might represent grounding of viewpoint in discourse. The SS and QI show the same opposite pattern: here the articulators are more often present (P184 to A89), possibly showing the activation of reactivation of perspective.

Looking at the grounding of perspective of viewpoint in the dialogue as a whole we did not find a significant association between the number of articulators used and the grounding of viewpoint in conversation. A possible explanation for our findings in Study 1 might be the fact that the grounding of perspective can be influenced by the presence of other competing perspectives or other intervening language materials (i.e., it might be more of a local phenomenon). After a reclassification of the quotes in our corpus based on a more local interpretation of grounding we did find a significant association between these articulators and the three environments in which quote occurs. These results raise a number of questions and suggest new avenues of investigation. More (qualitative and quantitative) research is needed to describe and test how these different articulators are used in the presentation of viewpoint.

The use of semi spontaneous dialogue has the advantage of showing that a phenomenon is real for the participants in actual conversation. However, it also makes it harder to make precise statements about the phenomenon under investigation. Further empirical research is needed to make the role of gesture in the presentation of viewpoint more explicit.