Clarifying by alignment: the role of figure and ground

Perhaps the most consistent empirical finding in dialogue research is the contraction of referring expressions on repeated use (Krauss and Weinheimer, 1966; Clark, 1996). Although existing models agree this process is underwritten by inter-individual processes, they differ in their accounts of how it is achieved. The collaborative model of Clark et al. (1996) emphasizes the role of iterative cycles of positive evidence of understanding, while the interactive alignment model of Pickering and Garrod (2004) emphasizes priming resulting in alignment of representations. All things being equal, alignment between turns is taken as indicative of higher levels of semantic co-ordination.

However, empirical evidence also demonstrates the importance of alignment in resolving problematic understanding. The canonical example is embedded correction (Chouinard and Clark, 2003; Saxton, 2007) which exploits the structure provided by alignment to make a figure/ground distinction, thereby allowing the corrected element to be identified. Clarification requests similarly rely on alignment to locate the problematic element. Central to the claims developed in this paper is that this figure/ground distinction permits two contrasting ways of identifying problematic elements. "Gap" clarifications (Purver et al., 2003), exemplified by CR1 below, align on the unproblematic elements of the utterance while omitting the problematic element. Conversely, "Frag" clarifications identify the problematic element by aligning on it and omitting the rest:

Problematic turn: I saw the **book** on the table.
CR1 ("Gap"): You saw the **what** on the table?
CR2 ("Frag"): **book?**

What motivates speakers' choice of figure/ground in formulating clarification requests? Intuitively it might appear that "Gaps" signal mishearings, however Drew's (2007) analysis of open-class repair works against this assumption. Answering this question presents a difficulty for existing models due to their semantic neutrality: in problematic dialogue, there is a general expectation that interlocutors will modify their original utterance in response to a CR, but no mechanism is provided that predicts the kind of semantic change that occurs. This difficulty is compounded by "Gaps" and "Frags" being informationally equivalent with respect to locating the problematic element.

To address these issues, this paper reports a variant of the maze-task experiment (Garrod and Anderson, 1987) that tests the equivalence of "Gaps" and "Frags" by investigating the effect of problem-source and CR type on inter-speaker co-ordination. Participants communicate with each other via a novel text-based chat tool described in Healey and Mills (2006) that allows fine-grained manipulation of the unfolding dialogue. The chat tool is used to intercept participants' turns, selectively transforming naturally occurring clarification requests into "Gaps" and "Frags".

This paper presents both global and local patterns in maze task dialogue that are not readily addressed by existing models. We argue that participants' choice of figure/ground distinction in generating clarification requests is motivated by the semantics of the expressions being clarified. This paper demonstrates participants' use of alignment to perform minor semantic modifications that selectively loosen the constraints on successful interpretation, evidenced by differences in the patterns of contraction in clarification responses.

We argue this demonstrates the need for an account of dialogue that is sensitive to semantic differences between different forms of co-ordination. We sketch an approach which emphasizes interlocutors' exploitation of alignment in dealing with problematic understanding.

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