Linguistic adaptation

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Abstract

Conversations are characterised by the fact that dialogue partners adapt their language to specific communicative contexts, where they have been shown to be especially sensitive to characteristics of the addressee. Prior work revealed that this holds for various kinds of linguistic structure, as it affects speakers' pronunciations, lexical choices, and syntactic structures. The current paper presents an overview of related research into gestures, i.e., movements of fingers, hands and arms that speakers produce with speech. We show how such gestures are affected by (1) the type of addressee, (2) the perspective of the addressee and (3) whether a gesture is meaningful for the addressee. We discuss the relevance of these findings for a more general model of spoken interaction.

Key words: Gestures, interactions, adaptation, non-verbal communication.

Introduction

Speakers adapt their speaking style to various communicative contexts; an important factor is the type of conversation partners with whom they are interacting. For instance, people may use slang words when talking to close friends or family members, but probably feel inclined to a more formal vocabulary when discussing work-related issues with their superiors at their office. Likewise, compared to their default language use, they may use simpler words and less complex syntactic structures, when they are addressing a child or when noticing that their addressee is a non-native speaker who has revealed problems of understanding during prior exchanges. There is much work on how such adaptive behaviour manifests itself, where it has been shown to affect linguistic structures, including pronunciation, lexical choices and syntactic structures (Branigan et al. 2010).

Such adaptive behaviour also appears from speakers' non-verbal features. For instance, it has been shown that speakers differ in their bodily expressions when addressing adults or children. Swerts and Krahmer (2010) compared newsreaders on Dutch public TV broadcasts, who were either reading the news for adults or for children. With children, newsreaders were more clearly signalling the emotional content of a news item through their facial expressions, e.g. clearly distinguishing between news with positive or more negative content, whereas their expressions were less variable when news with such different

emotional connotations was delivered to an adult audience. Conversely, children appreciate a more exaggerated style. House et al. (1999) found that children were more interested in a conversational agent that produced utterances with extreme intonation patterns, when compared to a neutral prosodic style of a model for standard speech synthesis systems.

Thus, features of the addressee may trigger speakers to modulate their nonverbal expressions. The current paper will embark on the gestures that people produce during their spoken interactions, in particular movements of the face, hand and arms (Kendon 2004, McNeill 2005). It is intuitively clear that such gestures have extra communicative value, as they may add meaningful information to what can be derived from the lexico-grammatical structure of an utterance. The problem we want to tackle here is to what extent the nature of these gestures is affected by aspects of the addressee, i.e. (1) the kind of addressee, (2) the addressee's perspective and (3) the relevance of the gesture for the addressee. The various studies presented below were part of a PhD research project of Lisette Mol, in collaboration with her supervisors. More elaborate descriptions of the studies can be found in the respective articles cited below.

Study 1: the kind of addressee

Background

The first study (Mol et al. 2009) looks at the extent to which speakers design their gestures to characteristics of the audience. The idea behind this research relates to the question regarding the extent to which gestures are primarily useful for the speaker, as an important component to facilitate the speech production, or whether they should be viewed as signals that serve a communicative function that is relevant for the addressee.

Paradigm

Participants were invited to watch a Sylvester and Tweety cartoon, and were then asked to recount scenes of the cartoon to another person or to a machine (a presumed audiovisual speech recognizer). The data below come from identical lab settings, where speakers were instructed to speak into a camera, and could not see the addressee, so that possible differences in their gesture and language behaviour could only be attributed to the speakers' beliefs about the kind of addressee.

Results

Participants produced more gestures when addressing a human than a machine, and used relatively few large and pointing gestures to an artificial addressee. A follow-up perception experiment revealed that judges who were presented with video fragments from the two conditions could tell above chance level whether

a clip was from an interaction with a human or machine, suggesting that they indeed expect different interaction styles.

Study 2: the addressee's perspective

Background

The second study (Mol et al 2011) explored whether speakers also take into account the addressee's visual perspective. We investigated whether a speaker would gesture differently, depending on whether speaking partners could or could not see each other. If speakers would gesture differently in contexts where the addressee could or could not see them, this could be interpreted as evidence that the context has an impact on gesture behaviour.

Paradigm

The paradigm was basically the same as the one for study 1, except that this time, we introduced settings whereby the addressee could see the speaker through a webcam (but not the other way around), the speaker could see the addressee (but not the other way around), in addition to conditions with mutual visibility and no visibility (sound only).

Results

Participants produced relatively more and larger gestures when they knew the addressee could see them, even when speakers themselves could not see their addressee, providing evidence that speakers took into account an addressee's perspective when producing gestures. However, note that the webcam condition also led to an unnatural situation as it did not allow direct eye-contact between participants. In a follow-up study, where we used a so-called Eyecatcher which allows direct eye-contact (in that sense being similar to a face-to-face condition), we found that speakers did produce more gestures when seeing the addressee.

Study 3: the relevance of the gesture

Background

The third study (Mol et al 2012) tried to gain more insight into the reasons why people repeat gestures from their partners. The question we wanted to address is whether cases of gestural mimicry should be viewed as manifestations of simple copying behaviour, or whether the repeated gestures are tied to meaning in the linguistic context.

Paradigm

To test this, we conducted a number of experiments, whereby participants would first watch video recordings who would tell scenes of a story to them, which the participant would subsequently have to retell to the experimenter.

Results

A first experiment had two conditions, one where the confederate would sometimes produce gestures vs a condition without any gesturing. Participants more often produced gestures when they had seen them from the confederate. In a second experiment, we compared a condition where the confederate would sometimes produce gestures that did not match the semantic content (e.g. a running gesture when talking about binoculars) vs a condition where the gestures always matched the content. Participants more often repeated gestures if they were meaningful.

Conclusion

This paper presented four studies that together provided evidence that speakers adapt their gestures to the communicative context, in particular characteristics of the conversation partner: their gestures appear to be dependent on the type of addressee, the perspective of the addressee and whether the gesture made sense for an addressee. These addressee-dependent aspects of gesture production suggest that movements of the finger, hand and arms are not solely produced to facilitate a speaker's speech production, but also have a clear functional role to meet the needs of addressees.

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