

# Alignment in Communication

Collaborative Research Center 673 at Bielefeld University

Gert Rickheit, Ipke Wachsmuth

**Cooperation and coordination in action and communication have been major research issues in the cognitive sciences and the study of artificial agents in recent years. Started in July 2006, the Bielefeld CRC 673 "Alignment in Communication" investigates special modes of coordination, called alignment. Alignment covers the adaptation processes among agents which are assumed to be subconscious in humans and which do not involve explicit negotiation and control by those engaged in a common enterprise. Alignment thus conceived can be observed in human-human communication with respect to a variety of linguistic and cognitive phenomena. At the same time, alignment in human-robot communication and human interface management may serve as one of the main assets in the construction of robots and virtual reality avatars that are better tailored to human needs.**

## 1 Project Theme: Introducing Alignment

The notion of alignment presents an innovative alternative to more established theories of human communication. The approach emphasizes the role of automaticity and routinization in bringing about common orientation at various levels of representation within and between interlocutors. We argue that the notion of alignment in communication provides a versatile, promising, and fruitful basis for a research initiative of the same name.

The general conviction that motivates our commitment is quite straightforward: We believe that human conversation is so smooth and easy because people engaged in dialogue have at their disposal an extensive pool of information, plus appropriate ways of transmission (by verbal as well as non-verbal means). With that, they can take advantage of even the most rudimentary of verbal expressions. In other words, we suggest the traditional idea that dialogue comprises an abundance of such things as ambiguous, incomplete or incorrect utterances to be abandoned. Rather, we believe that every single expression is a potential contribution to the purpose of making sense.

In consequence, we suggest research efforts to be focused on the less obvious aspects of communication: the role of automaticity, conventions, correspondence, convergence, and the like. We believe that, crucially, such a theory of communication has to be built around the notion of alignment. By this we mean the – seemingly casual – process of "harmonic orientation" (Bühler, 1934: 124) of the participants in a conversation, the state of similarity in mental structures ensuing from that, and the way such a degree of similarity is achieved. Common orientation, brought about by alignment processes, is what facilitates conversation. Common orientation exempts agents from constantly negotiating their respective points of view.

*Accordingly, alignment in communication can be defined as an ensemble of verbal and non-verbal means that serve to increase the similarity in structure of two interacting dynamic systems in a largely automatic and non-reflexive fashion, without an explicit exchange of information on system states.*

## 2 What is Innovative about Alignment?

The interactive alignment approach presents a novel research paradigm on dialogue, covering roughly the same fields as do dialogue game theory (Mann 1988) and the joint project approach (Clark 1996). So what innovative alternatives to these more established lines of research does the interactive alignment approach specifically offer?

### New Insights on Language Use in Dialogue

In their interactive alignment theory, Pickering and Garrod (2004) claim that successful dialogue depends on aligned representations at all linguistic levels. In their view, global alignment arises from local alignment at any level of linguistic representations via priming: Priming at one level triggers priming at a neighbouring level; hence the processes involved are – at least to some extent – automatic. In addition, alignment is massively fostered by the interactive nature of dialogue. First of all, there is priming between interlocutors. Due to input-output coordination, parity is achieved between the representations used in production and comprehension, manifesting in joint constructions, and the fixing and monitoring of common ground. In addition, there is intra-individual priming: Alignment at the lexical level leads to alignment on the set of referring expressions used. In the same vein, syntactic priming gives rise to alignment for constituents. Finally, natural language itself provides constraints for information packaging in dialogue to be observed in order to guarantee success of linked dialogue moves.

### New Impetus for a Theory of Language

Interactive alignment also has consequences for the established doctrine of linguistic theory. The existence of joint constructions in dialogue (e.g., completions, continuations, or handling of fragments) necessitates the assumption of "sub-sentential turns". As a consequence, linguistics must work with a more flexible notion of constituency than the ones adopted by most paradigms. Another argument shows the importance of implementing the notion of incrementality into dialogue-bound linguistics: Since interlocutors can only control the alignment process if some sort of feedback exists,