THE EMERGENCE OF GAZE CONVENTIONS IN INTERPERSONAL COORDINATION

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A central finding in psycholinguistic research is that when people interact with each other they rapidly develop new idiosyncratic referring expressions and associated meanings with their conversational partner (Clark, 1996; Pickering and Garrod, 2004)

In addition to natural language, conversational interaction is underpinned by myriad non-verbal signals which are used, inter-alia, to regulate turn-taking (Argyle, 1988; Holler et al., 2016). For example, speakers tend to look away from their addressee while speaking and then re-establish eye-contact to signal the end of their turn.

However, it is currently unclear whether such turn-taking signals are static and fixed, or whether, like natural language, they are negotiated by participants during interaction. To address this question participants play a novel collaborative task, in virtual reality. The task is played by 3 participants, and is inspired by games such as guitar hero and dance-dance revolution. The three key differences are: (1) Instead of performing target sequences of musical notes or dance moves, participants need to perform sequences of gaze events. E.g. a typical target sequence might be: "*Person 2 must look at person 3. Then person 3 must look at person 1. Then person 1 and person 2 look at each other*" (2) On each trial, only one participant (the director) sees the target sequence. This means that in order for the group to complete the target sequence, the director has to instruct the others (3) Crucially the participants are not allowed to use natural language – they may only communicate by looking at each other. Solving the task, therefore, requires that participants bootstrap a communication system, solely using their gaze patterns.

We conducted a set of experiments where triads played this game for 25 minutes followed by a manipulation which swapped participants` identities: In Participant 1`s view, Participant 2`s avatar is controlled by Participant 3, while Participant 3`s avatar is controlled by Participant 2. In Participant 2`s view, Participant 1`s avatar is controlled by Participant 3 and vice versa. Similarly for Participant 3`s view. The intention behind this manipulation is that if participants establish pair-specific routines with each of their partners, this swap will disrupt co-ordination, since after the swap, participants will be interacting with a different partner who is using different routines.

The results show that during the first 25 minutes of the task, triads are able to establish a communication system that allows them to solve sequences of up to 8 gaze events. Moreover, the results show that after swapping participants` identities, triads perform worse at the task, suggesting that the routines established to coordinate the timing and sequencing of eye-gaze can be flexibly negotiated during interaction.

References

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