The relationship between non-verbal alignment and cooperativeness in a game theory-based TV show

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Throughout our evolutionary history, and in our everyday lives, it has been crucial to identify good and reliable cooperation partners. Recently, different aspects of conversation have been investigated with regard to their potential for assessing others' cooperative intents (Henrich & Henrich, 2007). Low-level mechanisms such as linguistically aligning with others (Pickering & Garrod, 2004) have been proposed to be robust indicators of cooperativeness (Wacewicz et al., 2017), and research indicates that emotional (Baumann et al., 2024) and syntactic (Matzinger et al., 2024) alignment correlate with cooperation.

While prior investigations addressed the impact of verbal forms of alignment on cooperation, the inherently multimodal nature of human communication requires additional research that includes gestural and multimodal alignment (Kendon, 2004; Rasenberg et al., 2020). In fact, previous studies indicate that speakers use a multitude of gestures to coordinate their common ground (Holler & Beattie, 2007; Holler, 2009) and that gestural alignment plays a non-trivial role in communicative success (Rasenberg et al., 2022). Our study takes the next step and links the alignment of non-verbal signals such as gestures or body postures to cooperative behavior, hypothesizing that individuals are more inclined to cooperate with partners who align with them in their use of non-verbal signals.

To test this, we have annotated non-verbal signals displayed by interactants in 39 episodes of the British TV game show *Golden Balls*. In this show, contestants face the decision to either split or steal a monetary prize in a game theory-based scenario. Before, they engage in strategic discussions that are ideal for examining their communicative movements.

We will analyze the frequencies and temporal patterns of different types of non-verbal behaviors (hand movements, head movements, posture changes) used across the conversations, and will use generalized linear mixed effects models to correlate those measures with the contestants' decisions to cooperate ("split") or defect ("steal"). We predict that contestants who closely align in frequency, types and temporal patterns of their movements will be more likely to cooperate than those who align less.

We will compare our results with results on emotional alignment (Baumann et al., 2024), alignment of turn-taking and alignment of syntax (Matzinger et al., 2024) that are based on the same game show dataset. By that, we expect to elucidate the relative importance of non-verbal alignment for judging others' cooperativeness in comparison to verbal alignment, which may be easier to consciously

influence and thus fake. Ultimately, this will shed light on the role of multimodal communication for cooperative partner choice.

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