

Movement coordination: between interpersonal connection and individual autonomy

Let us imagine a pair of dancers on a ballroom floor. They move gracefully and harmoniously in relation to each other. Sometimes they move closer to each other, sometimes further apart but at all times their steps are coordinated and allow them to stay connected in their dance. Looking from the outside, it seems that on some level they share a deep connection. Is it also a part of their experience? How through this non-verbal communication a feeling of togetherness is built? Does this feeling of togetherness translates to a more cognitive understanding, are the dancers mutually aware of their thoughts and feelings?

It turns out that these questions are not limited to dance but are central for an important scientific debate concerning so-called social cognition. Traditional theories of social cognition assume that people use certain cognitive mechanisms in order to predict intentions, desires or beliefs of others. Then, using such mental representations, they can plan their actions to match the actions of other people. Enactive theories make the picture more complex. They draw our attention to the fact that the interaction itself creates a context that shapes our experience of togetherness and mutual understanding. It is impossible to explain social interactions through individual cognitive mechanisms alone; it is necessary to consider the whole system. According to the enactive theories, many aspects of social interactions can be regulated by a coupled dynamics of interpersonal coordination, sometimes without the conscious awareness of the participants.

In the current project, I plan to study social interactions empirically through improvised dance duets. I will verify whether moving together in an interaction is related to mutual understanding between partners. I intend to study the relationship between movement coordination and the feeling of togetherness, as well as the success in mutual mindreading (guessing someone's thoughts and feelings). In an experiment in which participants communicate through a double video link (as on a videoconference) I will disrupt participants' coordination by subtly desynchronizing video images. If movement coordination is indeed the basis of mutual understanding, its disruption should influence participants' experience. Next, I will make the participants interact with artificial agents represented by animated avatars. I will verify whether movement coordination modelled after human duets leads to more natural interaction experience and more trust towards artificial intelligence.

Thanks to the project findings, we will be able to better understand why some social interactions are experienced as smooth and pleasant, while others are difficult and devoid of the feeling of mutual understanding. This will also help to explain why certain people, for instance individuals on autism spectrum, may experience difficulties in smoothly navigating through social interactions. This knowledge may aid in designing therapeutic programs or soft-skills trainings using the elements of movement and dance. Understanding the basics of social interaction dynamics will be also useful for designing human-machine interactions, for instance in the context of chatbots or robots.