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Putting interaction center-stage for the study of knowledge structures and processes

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Introduction

Humans are social animals. Human cognition evolved in a social context. Human cognition develops in a social context. Thus, both the internal mechanisms of cognition and the information we use are social. In this workshop, we aim to extend the boundaries of cognitive sciences beyond individual minds. Following the lead of Dingemanse et al. (2023), we put interaction in focus as a complementary starting point for the study of human cognition.

A critical implication of grounding cognition in interaction is recognizing the constitutive role of the environment - including structures shaped in social interactions - in supporting, constraining and enabling interactive processes. Routines, social practices, language, tools, institutions, algorithms, artifacts, technology and AI, all of which shape our minds in development and engage us in daily lives, can be studied in their role of *modulators of relationships* and *interactions*, working on multiple timescales. In addition, this conceptual move calls for new theories of human cognition, new methods, and interdisciplinary alliances (Bickhard, 2017; Dale, 2008).

The Structure of the Workshop

This workshop brings together anthropological, ecological psychology, and enactivist perspectives in an attempt to put relationships and interactions in focus for the study of human cognition. It consists of three sessions, comprising 2-3 short talks devoted, respectively, to i) theoretical concerns; ii) formal tools and methodology and iii) empirical cases. Each session ends with an in-depth discussion. In the last session of the workshop, participants are invited to apply the interactive/relational perspective to their research topics, point to novel questions that such perspective brings about, where different methodologies might complement each other, and where novel methods are needed. Innovative research and analytical tools will be showcased during the talks and discussions. The abstracts of the presentations are as follows:

Theoretical concerns

Dingemanse, representing a diverse collective of 28 authors from across the cognitive sciences, will review work that locates cognition not in isolated but in interacting minds, highlighting the possibility for a figure-ground reversal. Classical 'single-minded' views already started to unravel when cognitive scientists recognized the need to consider cognitive processes in terms of interacting systems. Work since then has shown how this view can be extended outward to interacting agents and other collectives, problematizing any simple divide between the mental and the social (Shteynberg, 2014). The interactive stance helps bring out the irreducibly social and relational aspects of cognition. It also sheds new light on questions that will occupy the cognitive sciences for some time to come, including: how interaction can be the meeting ground for all kinds of minds; why people attribute intelligence to interactive agents; and where metacognition comes from (Dingemanse et al., 2023).

Enfield will further develop the argument that the concepts encoded in linguistic meanings are necessarily social-relational. This is not only because individuals must construct concepts based on inferences about their associates' knowledge and beliefs but because the responses that linguistic signs beget make language possible as a form of animal communication (Krebs & Dawkins, 1984). This presentation explicates that logic, defining a linguistic concept as a kind of choice architecture, by which a semantic signal's "sender" constructs and wields linguistic concepts as demand characters that play upon the anticipated response character of the signal's "receiver". Linguistic concepts are derived from, and maintained by their use in, these demand-response pairings. They are as much social-relational as they are psychological entities.

Rączaszek-Leonardi & Zubek will draw attention to the fundamentally relational nature of concepts, their grounding in first-person experiences of active agents and, in the case of humans, their deeply social nature (Rączaszek-Leonardi & Zubek, 2023). The philosophical foundations of radical empiricism (James, 1912) allows for relations to be directly perceived and for experience of movement and agency, to be constitutive of these relations (Sheets-Johnstone, 1989). It will be argued that such a view of concepts provides for their flexibility and pertinence both to everyday action and to first-person experience (De Jaegher, 2021).

Formalisms and Methods

Richardson & Kallen will review cutting-edge research methodologies and computational analysis and modeling techniques that enable researchers to probe the reciprocal

processes of social interaction and context sensitive activity (Crone & Kallen, 2022; Douglas et al., 2022; Nalepka et al., 2019). Motivated by behavioral dynamics (Warren, 2006) and a complex systems approach to human behavior, they will argue how individual and collective behavior emerge from the self-organizing dynamics of agent-environment systems and that the laws of symmetry and symmetry breaking provide a formula language for understanding human behavior and cognition at any scale (Kallen et al., 2022; Richardson & Kallen, 2016).

Romero, Paxton, & Chowdhury will argue that—to fully understand embodied and embedded cognition—we should focus on understanding interactions at multiple levels and between multiple components (e.g., verbal and nonverbal; Rasenberg et al., 2020). In an attempt to move in this direction, a toolbox will be presented, designed to extract multimodal alignment information from video recordings of conversations with the help of artificial intelligence tools. The application of this toolbox will be reviewed using examples and then made available to workshop attendants to use in their own research.

Empirical Cases

Karmazyn-Raz & Smith will present new evidence on the creation of coherence statistics in infant and parent social interaction during play. They argue that the development of human cognition does not occur in isolation but emerges in the flow of daily social activities. These activities - mealtime, getting dressed, play - are contextually bound, time extended, and shaped by the moment-to-moment behaviors of the infant and the mature social partner(s). They show how the dynamics of parent behavior, infant behavior, and physical context create higher order meaning across three time scales: moment behavior, within episode, and across episodes. Each parent-infant creates their own unique meaning within an episode. The coherence statistics across episodes create higher order relations or systems of knowledge.

Tylén will show that taking an interaction stance on cognition invites us to appreciate the role of action and material culture in mediating and scaffolding cognitive processes. In most contexts, cognition thus unfolds as a 'public' process constituted by coordinated epistemic (inter)action,, making properties of the interaction itself a 'control parameter' for interpersonal cognitive processes. Examples are drawn from studies of collective problem-solving and creativity to demonstrate how properties of the interaction - more than the individual dyad members - become predictive of the experimental outcomes.

Acknowledgments

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