

Anthropological Contributions to Cognitive Science

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Anthropology was a founding member of cognitive science (Bender et al., 2010; Gardner, 1985), sharing with other cognitive disciplines a deep interest in thinking and behavior. With its unique expertise in the cultural content, context, and constitution of cognition, it would still be essential to any comprehensive endeavor to explore the human mind (Bloch, 2012), but rather has turned into cognitive science's "missing discipline" (Boden, 2006), thus leaving important questions unanswered or even unasked. Given that substantial shares of knowledge are implicit and that cognition is situated, distributed, embodied, and grounded in various other ways, anthropological approaches provide privileged access to investigation: for arriving at reasonable hypotheses, ensuring ecological validity, and even for coming up with new research questions and paradigms (Astuti & Bloch, 2012; Hutchins, 2010; Nersessian, 2006).

In line with recent calls for rapprochement in *Topics in Cognitive Science* (Bender et al., 2012; Beller & Bender, 2015), our symposium brings together scholars that represent different branches of contemporary anthropology with distinct perspectives—including 'traditional' social anthropology, cognitive anthropology and ethno-linguistics, cognitive ecology, evolutionary anthropology, and archaeology—to present what they consider to be indispensable contributions to cognitive science.

With our selection of authors, we hope to demonstrate the value of anthropological approaches for cognitive science as well as the potential benefits of cross-disciplinary collaboration. Cognitive archaeologist **Overmann** discusses a theoretical perspective on how mind, behavior, and material artifacts interact to shape human cognition. Combining their expertise in linguistics and evolutionary anthropology, **Rácz** and **Jordan** investigate the design principles of kinship sys-

tems as near-universal conceptual tools. With his background in (ethno-)linguistics and cognitive anthropology, **Le Guen** uses Yucatec Maya sign languages to illustrate the importance of cultural practices for shaping cognitive behavior. Based on Hutchins' cognitive ecology approach, **Solberg** speaks to questions at the intersection of anthropology and philosophy of science by illuminating the cultural framework of science production in a biology lab. And social anthropologist **Astuti** concludes by taking a bird's eye view on how efforts to understand the human mind crucially benefit from acknowledging its historical origins and from taking the specific sociocultural contexts into consideration.

Based on work some of which is published in high-quality journals (such as *Science*, *Nature*, *PNAS*, *BBS*, *TiCS*, *Current Anthropology*, or *Cognition*), these participants will offer invaluable contributions to a more diverse, more inclusive, and hence more comprehensive cognitive science.

Archaeology and Cognitive Science

Karenleigh A. Overmann

Archaeology contributes to cognitive science in two key areas. First, in understanding human cognitive evolution, archaeology furnishes critical data on the timing and context of developments (Wynn, 2002). This approach assumes *minds make tools*: increasing complexity in material forms is an effect of, and thus signals, cognitive change related to neurological developments like encephalization. Second, archaeology provides unique insight into the ways materiality functions within the extended, enacted mind. This inverted approach—*tools make minds* (Malafouris, 2013)—examines how material forms interact with body and brain to create meaning and experience and potentialize behavioral and psychological change. In both contributions, archaeology negotiates temporalities, centuries to millennia and longer, that can be challenging for psychological theories and methods to assimilate (e.g., Overmann, 2016).

Cognitive and Adaptive-Historical Explanations for Kinship Diversity

Peter Rácz & Fiona Jordan

Kinship systems are semantic systems whose forms can be explained in terms of domain-general cognitive principles; kinship categories are optimised to be maximally distinct and as simple as possible. Kinship, then, is similar to other universal semantic categories such as colour terms. However, whereas colour terms broadly fit into one typological hierarchy, kinship systems comprise a diverse typology. Alternatively, adaptive-historical explanations emphasise how cultural traditions and social practices (particularly marriage and transfer of resources) place functional pressures on the shape of kinship systems (Jordan & Dunn, 2010). Using a global ethnographic database of over a thousand societies we show that marriage rules and ancestry have a significant influence on the type of kinship system found in a society. This remains true if we control for the effect of lateral transmission and phylogeny. This, in turn, means that kinship is best approached by combining cognitive and historic-anthropological explanations. These results have broader implications for the understanding of lexical systems in particular and the mechanisms of human cognition in general.

How Cultural Settings Frame Spatial Cognition: The Example of Yucatec Maya and Yucatec Maya Sign Language

Olivier Le Guen

On the Yucatec peninsula, the main native language is spoken Yucatec Maya (YM). However, in villages where deaf people are born, a local sign language (YMSL) was created both by deaf and their hearing kin. Although both languages are in intense contact, they are genetically different, and YMSL is not a signed version of YM. In Le Guen (2011), I showed how gestures—in addition to linguistic structures (Levinson, 2003)—can support a geocentric frame of reference. In this paper, I want to elaborate on how deaf signers using YMSL still ‘inherit’ the same conception of space through cultural practices.

Exploratory Experimentation in Experimental Systems: Novel Directions for the Cognitive Anthropology of Science

Mads Solberg

It is now widely recognised that progress in many scientific disciplines, like molecular biology, are not adequately described by the hypothetic-deductive model of epistemic action through experimental falsification. Instead, cumulative progress is achieved through description and modelling of mechanisms (interacting parts that produce regularities). One view claims that mechanistic discovery proceeds through exploratory experimentation; a practice where experimentation takes on many other cognitive functions than just hypothesis-testing. Experimental systems (material,

conceptual, social, and cultural infrastructures of laboratories) set up divisions of cognitive labour and distribute cognition through time and space in ways that are critical to this process. This talk looks at how the alliance between anthropology, cognitive science, and adjacent fields like philosophy and history of science, can contribute to further developing this research area. Such collaborations are necessary for adequately explaining cultural transmission and cultural evolution in scientific knowledge, and for describing interactions between mental representation, epistemic action, and material culture in scientific experimentation. I draw on examples from a long-term cognitive-ethnographic case-study in a community of molecular life-scientists.

Anthropology as a Critical Friend

Rita Astuti

Anthropology is commonly listed as one of the disciplines that make up cognitive science. But what exactly is the contribution that anthropology can make to the interdisciplinary study of human cognition? The paper will argue that anthropology must take on the role of critical friend, constantly reminding other disciplines of the historical origins of all human phenomena and of the theoretical and methodological challenges that come from recognising that all aspects of human cognition develop in specific social and cultural contexts.

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