



Imagination and Human Origins

Public Symposium • Friday, June 1, 2018

Chairs:

Sheldon Brown, UC San Diego & Alysson Muotri, UC San Diego

Sponsored by:

Center for Academic Research and Training in Anthropogeny (CARTA)

With generous support from:

The G. Harold and Leila Y. Mathers Charitable Foundation and The Paul G. Allen Frontiers Group

ABSTRACTS

What is Imagination?

Sheldon Brown, UC San Diego

One of the traits we attribute to differentiating our particular version of humanity from the rest of the realm of sentience is our “imagination.” The particular capabilities and operations of our imagination shape the behaviors that have allowed homo sapiens to create our anthropic era. But what is “imagination?” Imagination is one of those mushy terms that can be used to describe so many things that it ends up meaning almost nothing. Considering how imagination operates as a cognitive phenomenon that creates a cohesive version of reality might give us a basis to consider how the reality that we think we live in differs from that of other non-human entities. This consideration of the imagination’s fundamental role in humanities conceptions can also illuminate how we create knowledge about things that are beyond our ability to experience them – whether this is about far off places, or far off time, both in the future and in the past, such as at the origin of humanity.

Dream It, Be It: How Imagination and Creativity Reshaped Human Evolution

Agustín Fuentes, University of Notre Dame

Humans can see the world around them, imagine how it might be different, and translate those imaginings into reality...or at least try to. Meaning, imagination, and hope, are as central to the human evolutionary story as are bones, genes, and ecologies. Current paleoanthropological, archeological, and biological data make it abundantly clear that the human lineage, especially in the last two million years or so, underwent specific morphological changes alongside less easily measurable, but significant, behavioral and cognitive shifts as it forged, and was shaped by a new niche, a highly distinctive way of being in the world—a human niche. This niche contains the human baseline of creativity, our ability to imagine, communicate, and collaborate with increasing prowess...processes that facilitated our lineages’ transition from a cluster of medium-sized, hairless, fangless, hornless, clawless ape-like beings armed with a few rocks and some sticks into the species who invented domestication, economies, cities, nations, religion, warfare and broad-scale peace. This talk lays out the framework and sketches an outline for how this happened.

Thinking About the Possible: Imagination and Learning in Early Childhood

Caren Walker, UC San Diego

Conventional wisdom suggests that knowledge and imagination, science and fantasy, are deeply different from one another – even opposites. However, new ideas about children’s causal reasoning suggests that exactly the same abilities that allow children to learn so much about the world, reason so powerfully about it, and act to change it, also allow them to imagine alternative worlds that may never exist at all. A large portion of our psychological lives is spent disengaging from our immediate observations – what is – to consider alternative possibilities – what could be. While the imagination has

long been assumed to generate this type of counterfactual thought, little research has explored how human minds, even the very youngest human minds, manage to produce these counterfactuals, how we know which possibilities will be the most likely to occur, and why imagining new possibilities is important. I will present an argument characterizing the relation between imagination and causal cognition, in light of recent developments in computational theories of cognitive development.

The Origins of Human Imagination and How Technology Enhances Our Imagination

Lyn Wadley, University of The Witwatersrand

Archaeological evidence for imagination is present, but rare and often controversial, before the appearance of *Homo sapiens sapiens*. The implication is that imagination is not the sole preserve of people like us; nonetheless, early *H. sapiens* took imaginative expressions to new heights. By 100,000 years ago, perforated and ochre-covered marine shells were found in early modern human burials and living sites and thereafter more material culture items convey imagination. Shell beads were strung to form a variety of patterns, and engraved ostrich eggshells, engraved ochre, notched bone pieces and hundreds of pieces of utilized ochre were found in South African sites. In the last 30,000 years, expressions of fantasy emerged, and people harnessed imagination to communicate their world view. To some extent, cumulative evidence for creative thought resulted from increasingly complex human cognition, but we must also consider the feedback relationship between brains and the manipulation of material culture.

Human Society as a Consequence of Human Imagination

Maurice Bloch, The London School of Economics and Political Science

The social of human beings has been, for at least fifty thousand years, totally different to that of our nearest relatives the Chimpanzees. This difference is due to the fact that human social organization is not simply a matter of ever more subtle communication between individuals. It is also a matter of imagination. This imagination consists of roles such as wife, professor, nephew, police officer, president etc. which regulate certain aspects of the social and also of the membership of groups such as clans or nations which are represented as ignoring the continual fluidity and change of activated relations among living people. This addition of the imaginary social means that our social is, in certain ways, double. On the one hand, it is a matter of continual transactions made possible by our capacities to read each other's minds and adapt accordingly. On the other hand, it is a matter of imaging the social system as fairly stable and existing beyond moments of interaction. This social use of imagination has enabled human societies to be of far greater size than the social groups of the chimpanzees and also of lasting much longer in time than the limitations that our organic nature seems to impose.

Building Complex Knowledge with Language and Imagination

Lera Boroditsky, UC San Diego

One of the great mysteries of the mind is how we are able to think about things we can never see or touch. How do we come to represent and reason about abstract domains like time, justice, or ideas? All of our experience of the world is physical, accomplished through sensory perception and motor action. We collect photons through our eyes, respond to physical pressure in our ears, and bend our knees and flex our toes in just the right amount to defy gravity. And yet our internal mental lives go far beyond what we can observe through physical experience; we invent sophisticated notions of number and time, we theorize about atoms and invisible forces, and we worry about love, justice, ideas, goals, and principles. The ability to cognitively transcend the physical is one of the very hallmarks of human intelligence. I will review some of the ways human minds reuse the basic machinery evolved for perception and motor action, for the purposes of imagining the invisible and the impossible.

Imagining Society: The Art of Firelight Stories

Polly Wiessner, University of Utah/Arizona State University

Some 300-400,000 years ago, early humans gained control of fire, extending the day and significantly altering their circadian rhythms. Humans became the shortest sleepers of all primates. Since the 4-6 hours gained was not economically productive time, selection pressures for these changes must have been strong. What were the benefits to human societies of the extending the day by firelight?

Here I will compare day and night conversations and activities of the Kalahari Bushmen to better understand what transpires during firelit hours. In contrast to the practicalities and gossip of the day, the atmosphere of the night around hearths draws people into the domain of the imagination via the arts of song, dance and story telling. The art of story telling inspires the formation of mental images regarding social institutions not present to the senses and never wholly perceived in reality. While daily life in small bands does not convey an overarching view of Bushman society, fireside stories review kinship relations, past marriages, visions of the spirit world or travels along networks. They stimulate the senses with images and emotions that allow people to imagine the big picture of society, intangible though it is. They create a space and context for people to understand the perspectives of others and to imagine society and their relative positions in it. In view of this, it is not surprising that stories whether conveyed by voice, film or the written word continue to ignite the imagination in all societies today.

Using Imagination to Create Reconstructions of Ancient Hominins

Adrie and Alfons Kennis, Kennis and Kennis Reconstructions

Exclusively for CARTA, the Kennis brothers are featured in a video interview in their Amsterdam workshop. This video will give viewers an inside look at the brothers' work and how imagination has played a role in how these two fully modern humans are able to "reconstruct" our extinct relatives.

Reconstructing the Neanderthal Mind in a Dish

Alysson Muotri, UC San Diego

The complexity of the human brain, with thousands of neuronal types, permits the development of sophisticated behavioral repertoires, such as language, tool use, self-awareness, symbolic thought, cultural learning and consciousness in a short period of evolutionary time. Understanding what produces such complex network system during brain development has been a longstanding challenge for neuroscientists and may bring insights into the evolution of human cognition. Human pluripotent stem cells have the ability to differentiate in specialized in different cell types and tissues. From these pluripotent state, it is possible to generate organoid models, simplified representations of the human brain. We have been using brain-model technology (BMT) combined with genome editing to gain insights on several biological processes, such as human neurodevelopment and evolution. The reconstruction of human network activity evolving in a dish can help to understand how neural network oscillations might contribute to human imagination. Our findings suggest a potential bridge to the gap between the microscale in vitro neural networks electrophysiology and the live human brain.