SOCIAL CURIOSITY

October 6 - October 7, 2022
Göttingen, Germany

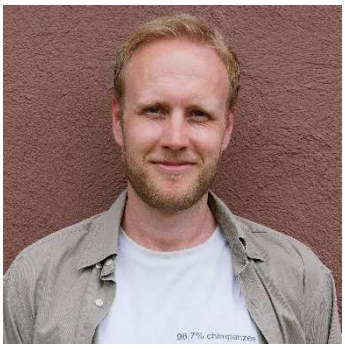
Talks and Abstracts

October 6, 2022

Jan Engelmann (09:45-10:30)

University of California Berkeley, USA

Two kinds of social curiosity in young children

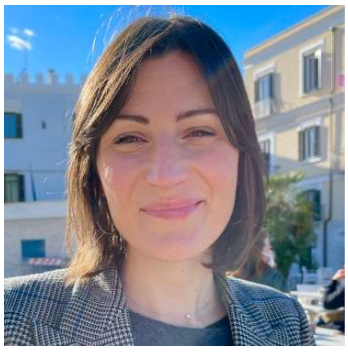


Children's curiosity has been nearly exclusively studied in non-social contexts. In this talk, I will identify two ways in which humans' ultra-social lifestyles influence children's curiosity. In the first part, I will present a study on '*social content curiosity*', that is, interest in how other people think, feel, and behave. In the second part, I will focus on '*socially-mediated curiosity*' and present a study investigating how social context influences children's search for information.

Liuba Papeo (10:30-11:15)

CNRS Paris-Lyon & Université Claude-Bernard Lyon, France

Footprints of sociality in human vision



A common view is that sociality has contributed to shape the functioning of high-level cognitive systems. I will discuss how sociality has also re-shaped the functioning of visual perception, making it highly specialized and sophisticated. I will present a set of studies using behavioral, eye-tracking and neuroimaging methodologies on human adults and preverbal infants. Going beyond object recognition, the results of those studies demonstrate the existence of specialized perceptual mechanisms for processing social entities, their roles and relations. These mechanisms can be crucial for selecting and processing aspects of the visual environment from which we learn the most, namely, social interaction and relational structures, setting infants on the path of social learning.

Mattias Gruber (11:45-12:30)

Cardiff University, UK

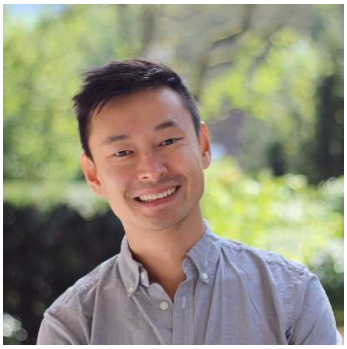
How curiosity affects learning and information seeking via the dopaminergic circuit

Over the last decade, research on curiosity – the desire to seek new information – has been rapidly growing. Several studies have shown that curiosity elicits activity within the dopaminergic circuit and thereby enhances hippocampus-dependent learning. However, given this new field of research, we do not have a good understanding yet of (i) how curiosity-based learning changes across the lifespan, (ii) why some people show better learning improvements due to curiosity than others, and (iii) whether lab-based research on curiosity translates to how curiosity affects information seeking in real life. In this talk, I will present a series of behavioural and neuroimaging studies that address these three questions about curiosity. First, I will present findings on how curiosity and interest affect learning differently in childhood and adolescence. Second, I will show data on how inter-individual differences in the magnitude of curiosity-based learning depend on the strength of resting-state functional connectivity within the cortico-mesolimbic dopaminergic circuit. Third, I will present findings on how the level of resting-state functional connectivity within this circuit is also associated with the frequency of real-life information seeking (i.e., about Covid-19-related news). Together, our findings help to refine our recently proposed framework – the Prediction, Appraisal, Curiosity, and Exploration (PACE) framework – that attempts to integrate theoretical ideas on the neurocognitive mechanisms of how curiosity is elicited, and how curiosity enhances learning and information seeking. Furthermore, our findings highlight the importance of curiosity research to better understand how curiosity can be harnessed to improve learning and information seeking in real life.

Charley Wu (14:30-15:15)

Tübingen University, Germany

Adaptive social learning in immersive foraging environments



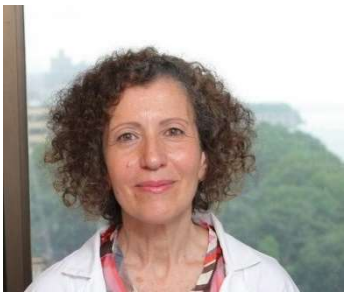
A key question in social environments is when to innovate alone and when to imitate others. Previous theoretical analyses and simulations have found that the best performing groups exhibit an intermediate balance, yet it is still largely unknown how individuals collectively negotiate this balance. We use an

immersive collective foraging experiment implemented in the Minecraft game engine, to provide unprecedented access to spatial trajectories and visual field data. The virtual environment imposes a limited field of view, creating a natural trade-off between allocating visual attention towards individual search or to look towards peers for social imitation. At the heart of this task is a coordination problem, where too many imitators can lead to a tragedy of the commons, causing a collapse in both individual and group fitness. This work utilizes an unprecedented combination of social network analysis (via automated transcription of visual field data), detection of social influence events, computational modeling of choices, and agent-based simulations to understand how people adaptively balance individual and social learning. Rather than homogeneity of strategies and indiscriminate copying of others, groups collectively adapt to the demands of the environment through specialization and selective imitation.

Jacqueline Gottlieb (15:45-16:30)

Columbia-Zuckermann Institute, USA

How curiosity emerges: the role of uncertainty and confidence representations



Humans are immensely curious and motivated to reduce uncertainty. Recent years generated much interest in the neural mechanisms of this process, based on an appreciation that curiosity is key for actively selecting information relevant for one's predictions or goals. An important unsolved question concerns the mechanisms that generate curiosity: how does the neural representation of an event give rise to feelings of curiosity about that event? Using a new task of perceptual curiosity combined with fMRI imaging in humans, I will present evidence that this link is mediated by neural representations of confidence and uncertainty. I will show that the occipito-temporal cortex (OTC), a high-level visual area, provides a multivariate representation of the uncertainty about a visual image, which is read out out by higher-order areas that encode confidence and,ultimately, translated into curiosity. The relationship between OTC certainty and curiosity is mediated by the ventromedial prefrontal cortex (vmPFC) but not the anterior cingulate cortex (ACC),

revealing the specific pathways through which representations of uncertainty generate curiosity.

October 7, 2022

Julia Leonard (09:30-10:15)

Yale University, USA

Social influences on children's persistence: The role of over-engaged parenting

Children's persistence in the face of challenge is central to learning and a key facet of curiosity. Yet it is increasingly common for parents to take over and solve problems for their children. In the first part of the talk, I will present correlational and causal evidence showing that this type of over-engaged parenting reduces children's persistence. In the second part of the talk, I will present ongoing work exploring which beliefs drive parents to solve problems for their children. Collectively, this research points to both psychological and structural ways to modify parents' over-engaged behavior, and in turn, increase children's opportunities for growth.

Sofia Forss (10:15-11:30)

Institute for Advanced Studies, University of Zurich, ETH Zurich and Zurich University of Arts, Switzerland

What can we learn from studying curiosity in animals? Insights from primatology

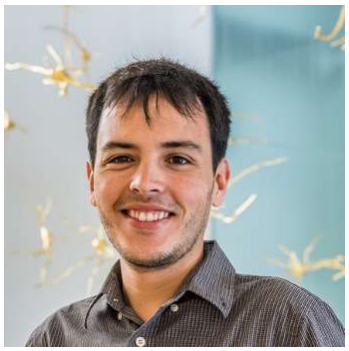
Curiosity is a core mechanism of intelligence, indispensable for driving life-long learning and reducing uncertainty about the world. In a broad and catch-all sense, curiosity is described as an "intrinsic motivation to acquire novel information in the absence of any immediate extrinsic reward". With a few exceptions, curiosity has mostly been investigated by psychologists and neuroscientists, typically studied through language-based tasks. But neither curiosity, nor intelligence are unique to humans. The current state of the art overlooks the fields of animal behaviour and comparative cognition and thus, existing approaches fail to address the evolutionary continuum of curiosity.

My aim here is to present work done on curiosity in primates to draw attention to factors that interlink with how curiosity evolved in our own species. Modern humans, lacking natural predators, thrive with curiosity, which is key to our creativity and learning. In contrast, our ancestors faced more hazardous environments that not necessarily favour individual curiosity. Our closest living relatives, the great apes have evolved facing conditions more like human ancestors and as such, can help us understand the functions of curiosity and its evolutionary history. Findings comparing ape species representing different social systems, suggest that curiosity follows a linear gradient across species in accordance with their sociality. I propose the social curiosity hypothesis to explain the observed pattern, reflecting those individuals in highly social species, like bonobos and chimpanzees, regularly are accompanied by conspecifics, and thereby accustomed to an abundance of social cues, leading to inhibited curiosity when alone, compared to more solitary orangutan species. Thus, being curious may have undergone selection in interaction with sociality.

Julian Jara-Ettinger (11:30-12:15)

Yale University, USA

The Computational Structure of Human Social Cognition



Social cognition is implicated in virtually all areas of uniquely human intelligence, and characterizing its computational structure is a central challenge in cognitive science. In recent decades, social cognition has been increasingly conceptualized as a problem of mental-state attribution grounded in recursive social inference. I will argue that this view captures only a narrow dimension of the socio-cognitive toolkit. Instead, I will propose that much of human social intelligence is supported by mental models of others as computational engines—probabilistic programs that represent and track the real-time computations happening in other people's minds as they interact with the world. I will present a computational framework of this approach and show how it helps explain uniquely human social behavior.