



Departmental Seminar

Beyond the Lab - Naturalistic Neuroimaging of Empathy and the Developing Social Brain

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ABSTRACT

Understanding how the social brain develops means measuring it where social life actually happens, in motion and while children are interacting in their usual environments. Functional near-infrared spectroscopy (fNIRS) is uniquely suited to this challenge, yet the paradigms that have shaped developmental fNIRS remain constrained, psychometrically fragile, and hard to apply to the children we most want to include. In this talk I trace a path from conventional to naturalistic developmental neuroscience, using the development of empathy as a running thread. I first present fNIRS evidence on how the cognitive and affective components of empathy emerge across early childhood, then examine the "naturalistic turn", i.e. what it offers, and what it costs. I introduce our work at the Birkbeck ToddlerLab combining wearable fNIRS and immersive virtual reality (the CAVE) to study empathy during naturalistic child–avatar interactions, alongside the analytic advances needed to analyse children's freely-moving data. Finally, I present an evidence-based framework for personalising wearable neuroimaging sessions for autistic and ADHD children, showing how inclusive, individualised protocols turn feasibility itself into a scientific contribution. I close by discussing the frontiers, such as reliability, reproducibility, and inclusive sampling, where naturalistic developmental fNIRS most needs to grow.

SPEAKER

Dr Chiara Bulgarelli is a Senior Lecturer in the School of Psychological Sciences at Birkbeck, University of London, where she leads the SAND (Social and Affective Neuroscience in Development) team within the Centre for Brain and Cognitive Development. She has a strong passion for understanding social development, which has always gone hand-in-hand with her interest in advancing data-analysis methods for functional near-infrared spectroscopy (fNIRS). A developmental neuroscientist with over ten years' experience in neuroimaging, she applies fNIRS to social, affective, and cognitive development from infancy to childhood. She completed her PhD in Developmental Cognitive Neuroscience at Birkbeck in 2018, then joined the Brain Imaging for Global Health (BRIGHT) project at UCL's Department of Medical Physics and Biomedical Engineering, where she developed standardised fNIRS analysis pipelines and mapped functional connectivity trajectories in Gambian infants. As a Leverhulme Trust Early Career Research Fellow at the Birkbeck ToddlerLab (2022–2025), she pioneered the use of wearable fNIRS and immersive virtual reality to naturalistically study the development of empathy in toddlers. Her work pairs methodological innovation in fNIRS with a strong commitment to inclusive developmental science: she co-chairs the fNIRS reliability group within the Respect4Neurodevelopment network and is a member of the Diversity in Developmental Science Network. She was awarded 2nd place in the SfNIRS Early Investigator Award (2022), and her research has been supported by the Leverhulme Trust, Wellcome Trust, Bill & Melinda Gates Foundation, and Royal Society.



Date:
13 Oct 2026 (Tue)

Time:
11:00 am - 12:30 pm

Venue:
Room G3, G/F,
Ho Tim Building, CUHK

Language:
English



Deadline: 12 Oct 2026

ALL ARE WELCOME



Enquiry:
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Online Registration:
<https://cloud.itsc.cuhk.edu.hk/webform/view.php?id=13742749>