The impact of Artificial Social Agents on children's socio-emotional development

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Background

A new generation of toys, apps, and tools is entering children's lives, and unlike anything before them, these technologies respond. They remember, adapt, and express something that feels like care. As Artificial Social Agents (ASAs) become embedded in the everyday lives of young children, a pressing developmental question emerges: what happens to the developing social brain when it repeatedly encounters something that looks and feels like a social partner but is not?

A growing body of research shows that young children are prone to treating conversational AI as quasi-social partners (Kurian, 2024; Xu et al., 2022), with recent neuroimaging work suggesting that AI interaction engages social brain networks in ways that may have lasting developmental consequences (Kim et al., 2025). Yet the developmental impact of sustained ASA interaction on children's social brain, empathy, and peer relationships remains unknown (Pashevich, 2022).

This project will investigate the impact of ASAs, AI-enhanced technologies that simulate contingent, personalised, and emotionally attuned social interaction, such as conversational chatbots, AI-enhanced toys, and socially responsive robots, on children's socio-emotional development in childhood. The proposed project will explore aspects such as the development of attachment behaviours, empathy, theory of mind, and peer relationships, within the framework of sustained interaction with ASAs compared to matched non-AI-enhanced technology. The core theoretical question is whether the developing social brain responds to artificial contingency in the same way it responds to human contingency, and with what consequences for the development of the social self. This project will advance fundamental understanding of how the social brain develops as AI becomes part of children's everyday lives, while generating timely, practical insights for parents, educators, and policymakers navigating children's growing interaction with AI.

Methodology

This PhD project will combine behavioural, observational, and neuroimaging methods to provide a comprehensive account of children's responses to ASAs. Behavioural measures will include structured interaction tasks with matched AI-enhanced and non-AI-enhanced toys, such as empathy and theory of mind assessments, and parent-reported measures of peer relationship quality. Neural measures will be recorded using functional near-infrared spectroscopy (fNIRS), a child-friendly, motion-tolerant neuroimaging method, to examine activation of social brain networks during naturalistic interaction with ASAs compared to matched non-AI technology (Jones, 2025). This will allow us to identify neural markers linked to the specific properties of ASAs, such as contingency, memory, emotional responsiveness, and embodiment, and to determine which of these features drive children's social responses. The project will be hosted at the Centre for Brain and Cognitive Development (Birkbeck, University of London), making use of its established facilities for developmental behavioural and neuroimaging research.

Key References

- Kurian, N. (2024). 'No, Alexa, no!': designing child-safe AI and protecting children from the risks of the 'empathy gap' in large language models. Learning, Media and Technology, 49(4), 621–634. https://doi.org/10.1080/17439884.2024.2367052
- Kim, P., Chin, J. H., Xie, Y., Brady, N., Yeh, T., & Yang, S. (2025). Young children's anthropomorphism of an AI chatbot: Brain activation and the role of parent co-presence. arXiv preprint arXiv:2512.02179.
- Pashevich, E. (2022). Can communication with social robots influence how children develop empathy? Best-evidence synthesis. AI & Society, 37, 579–589. https://doi.org/10.1007/s00146-021-01214-z
- Xu, Y., Aubele, J., Vigil, V., Bustamante, A. S., Kim, Y. S., & Warschauer, M. (2022). Dialogue with a conversational agent promotes children's story comprehension via enhancing engagement. Child Development, 93(2), e149–e167. https://doi.org/10.1111/cdev.13708

- Jones IL, Bulgarelli C, De Felice S, Pinti P, Hamilton AFC. How to design real-world functional near-infrared spectroscopy studies: a primer. Neurophotonics. 2026 Jan;13(Suppl 1):S10701. doi: 10.1117/1.NPh.13.S1.S10701.

Candidate Requirements:

Essential criteria

- A high 2:1 (≥65 pass mark) or 1st class undergraduate degree in a psychology or social science discipline.
- Master's degree in research methodology, psychology, or a related discipline (or equivalent professional experience). Postgraduate qualifications should be awarded before the PhD start date.
- Evidence of experience or training in research methodology (e.g., an experimental dissertation at BSc or MSc level) and in quantitative data analysis and statistics, if not apparent from the above.
- Experience of working with children, and/or conducting research with children
- Evidence of excellent organisational, problem-solving and analytical skills.
- Strong data management skills (e.g., maintaining structured datasets, organising participant records, managing study documentation).
- Proficient in the use of Microsoft Office applications (Word, Excel, PowerPoint, Outlook).
- Willingness to travel within and possibly beyond London for research purposes.
- Availability to work flexible hours to accommodate testing sessions with children and families, which may occasionally fall outside standard working hours
- Ability to work independently as well as in a collaborative research team.
- Excellent written and verbal communication skills in English.

Desirable criteria

- Research experience in a field relevant to the PhD studentship, including experience communicating with parents and educational settings.
- Programming skills (i.e. R, Matlab, Python)
- Experience with statistical software (e.g., SPSS, R, JASP)
- Experience with neuroimaging methods, particularly fNIRS.
- Familiarity with child development assessment tools.
- Publications in peer-reviewed academic journals, and/or scientific presentations in conferences.

The post-holder will be expected to contribute to the wider activities and life of the Centre for Brain and Cognitive Development (CBCD) and the Department of Psychological Sciences at Birkbeck, University of London.

Applicants are asked to support their application by detailing relevant modules or courses undertaken during their studies, research internships or employment, and any peer-reviewed academic publications.

Eligibility:

Only applicants eligible to pay fees at the UK rate will be considered.