Durham University
Department of Psychology

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Understanding Infant Language and Cognitive Development

Background

A lot of past research has examined some of the milestones and abilities infants have, such as when they learn their first words, or when they develop longer term memory. But there is a great deal of variability in development, for example knowing 2 words, or 200 words before your second birthday are both plausible outcomes. Our work at the Durham Babylab aims to understand the individual differences in language and cognitive development, and importantly *why* these outcomes might be so wildly different. We aim to understand the social, neural and environmental factors that affect language and cognitive development.

Aims and Methods

The candidate will likely use a mixed methods approach to understand these multi-faceted questions. We typically use a combination of lab-based methods, including eye-tracking and HD-DOT neuroimaging available in the Babylab, and observational methods, including head-mounted cameras and eye-trackers, wearable devices and questionnaires.

Figure 1. An infant participant doing eye-tracking and fNIRS in the Babylab

Relevance

The project touches on developmental psychology and educational psychology. It has relevance for child development, with possible implications for later learning differences, such as Developmental Language Disorder.

Training

The candidate's research activity will be based in Durham Psychology. Besides a training in general research skills, the candidate will develop a deeper understanding of working with infants, and specialized skills in eye-tracking and neuroimaging, as well as observational methods. We place an emphasis on skill development, including coding and statistics, and data processing.

Suitable for

PhD and MSc by Research students.

References and Further Reading

Wijeakumar, S., Forbes, S.H., Magnotta, V., Deoni, S., Jackson, K., Singh, V.P., Tiwari, M., Kumar, A., & Spencer, J.P. (2023). Stunting in infancy is associated with atypical activation of working memory and attention networks. *Nature Human Behavior, 7*, 2219-2211.

Johns, E., Forbes, S.H., Delgado Reyes, L., & Spencer, J.P. (2026). Tracking the trajectory of executive function from 2.5 to 6.5 years of age and the impact of COVID-19. *Child Development.*

Fibla, L., Forbes, S.H., McCarthy, J., Mee, K., Magnotta, V., Deoni, S., Cameron, D., & Spencer, J.P. (2023). Language exposure and brain myelination in early development. *Journal of Neuroscience, 43* (23). 4279-4290.