BRC-041 Developing novel observational coding schemes of emerging infant inattention and hyperactivity/impulsivity as a potential outcome measure in a pre-emptive cognitive training of attention deficit/hyperactivity disorder (ADHD)

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Project Description

Background: Psychological treatments for ADHD initiated after disorder onset have had only limited success. Preventative psychological treatments for ADHD implemented in infancy have been championed but not tested or implemented successfully.

Novelty and Importance: We are conducting an RCT (n = 50) of a novel, developmental neuroscience approach to early intervention for 10-month-old infants at familial risk for ADHD (gaze contingent attention training). The primary 14 month endpoint will be complete in October 2018 and follow-ups at age 24 and 36 months in Spring 2020. However, there is currently a lack of well validated objective assessments of early emerging attention and behavior in the infants/toddlers and little is known about the cognitive and psychophysiological correlates of aberrant preschool behaviour and attention.

Primary aim(s): The project will (a) build on existing approaches to the objective assessment of ADHD in preschoolers to develop and validate a new index specifically designed for the infant/toddler period and (b) use these codes to examine the cognitive and psychophysiological correlates of preschool attentional difficulties. The potential for objective behavioural assessments to be outcomes in future pre-emptive trials will be tested within the context of the RCT.

Planned research methods and training provided: The student will be involved in the 24 and 36 month evaluations but will also have access to all materials collected at the infant timepoints. They will be trained in clinical assessments and neurocognitive experimental techniques (eye-tracking, EEG/ERP and psychophysiological arousal measures). They will develop and test the reliability and validity of coding schemes that these early-emerging behaviours and then combine these with experimental methods that simultaneously capture cognitive and biological indexes of underlying neurocognitive development. The PhD student will receive interdisciplinary training from a clinical developmental psychologist (Charman) and an international expert in ADHD developmental neuroscience (Sonuga-Barke) to promote translational developmental cognitive neuroscience.

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Objectives / project plan:

Year 1: Training on clinical and experimental assessments. Review of existing literature on the assessment of preschool behaviour and attention with special reference to early emerging ADHD. Development of novel coding schemes for infant/toddler ADHD.

Year 2:. Analysis of the reliability and validity of the novel coding schemes.

Year 3: Training in statistical modeling and EEG, psychophysiological and eye-tracking analysis. Examination of the cognitive and psychophysiological correlates of early emerging attentional problems indexed by the new schemes.

Year 4: Analysis and paper writing. Completion of thesis.

Two representative publications from supervisors:

1: Johnson, M. H., Gliga, T., Jones, E. J. H., & **Charman, T.** (2015). Infant development, Autism and ADHD: Early pathways to emerging disorders. *Journal of Child Psychology and Psychiatry, 56*, 228-247.

2: 299. Goodwin, A., Salomone, S., Bolton, P., **Charman, T.**, Jones, E. J. H., Pickles, A., Robinson, E., Smith, T., **Sonuga-Barke, E. J. S**., Wass, S., Johnson, M. H. (2016). Attention training for infants at familial risk of ADHD (INTERSTAARS): study protocol for a randomised controlled trial. *Trials, 17*, 608.

Keywords: Attention deficit hyperactivity disorder (ADHD); omised controlled trial (RCT); Observational measures; Cognitive neuroscience; Developmental psychology

BRC Theme/s: Child and Neurodevelopmental Disorders
Translational Therapeutics