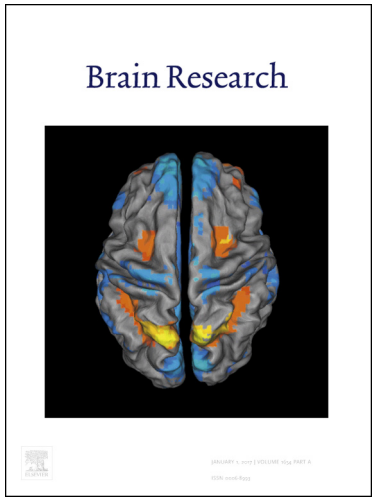

Research report

Indices of repetitive behaviour are correlated with patterns of intrinsic functional connectivity in youth with autism spectrum disorder

J.M. Traynor, K.A.R. Doyle-Thomas, L.C. Hanford, N.E. Foster, A. Tryfon, K.L. Hyde, E. Anagnostou, A.C. Evans, L. Zwaigenbaum, G.B.C. Hall, NeuroDevNet ASD Imaging Group

PII: S0006-8993(18)30067-2
DOI: https://doi.org/10.1016/j.brainres.2018.02.009
Reference: BRES 45663

To appear in: *Brain Research*

Received Date: 2 October 2017
Revised Date: 11 January 2018
Accepted Date: 5 February 2018

Please cite this article as: J.M. Traynor, K.A.R. Doyle-Thomas, L.C. Hanford, N.E. Foster, A. Tryfon, K.L. Hyde, E. Anagnostou, A.C. Evans, L. Zwaigenbaum, G.B.C. Hall, N. ASD Imaging Group, Indices of repetitive behaviour are correlated with patterns of intrinsic functional connectivity in youth with autism spectrum disorder, *Brain Research* (2018), doi: https://doi.org/10.1016/j.brainres.2018.02.009

TITLE: Indices of repetitive behaviour are correlated with patterns of intrinsic functional connectivity in youth with autism spectrum disorder

AUTHORS: Traynor, J.M[a]., Doyle-Thomas, K.A.R[b]., Hanford, L.C.[a], Foster, N.E.[c,d], Tryfon, A.[c,d], Hyde, K.L.[c,d], Anagnostou, E[b,e]., Evans, A.C.[f], Zwaigenbaum, L[g]., and Hall, G.B.C[a]; NeuroDevNet ASD Imaging Group[h]

[a] McMaster University, Department of Psychology, Neuroscience & Behaviour, Hamilton, Ontario, Canada
[b] Bloorview Research Institute, Holland Bloorview Kids Rehabilitation Hospital, University of Toronto, Toronto, Ontario, Canada
[c] International Laboratory for Brain Music and Sound (BRAMS), University of Montreal, Montreal, Quebec, Canada
[d] Faculty of Medicine, McGill University, Montreal, Quebec, Canada
[e] Department of Pediatrics, University of Toronto, Toronto, Ontario, Canada
[f] Montreal Neurological Institute, Montreal, Quebec, Canada
[g] Department of Pediatrics, University of Alberta, Edmonton, Alberta, Canada
[h] http://www.neurodevnet.ca/research/asd, Vancouver, British Columbia, Canada

CORRESPONDING AUTHOR: Geoffrey B.C. Hall, Psychology Building (PC) Room 307, McMaster University, 1280 Main Street West, Hamilton, Ontario, Canada, L8S 4K1. phone: 1.905.525.9140 x 23033. email: hallg@mcmaster.ca

ABSTRACT: The purpose of the current study was to examine how repetitive behaviour in Autism Spectrum Disorder (ASD) is related to intrinsic functional connectivity patterns in a number of large-scale, neural networks. Resting-state fMRI scans from thirty subjects with ASD and thirty-two age-matched, typically developing control subjects were analysed. Seed-to-voxel and ROI-to-ROI functional connectivity analyses were used to examine resting-state connectivity in a number of cortical and subcortical neural networks. Bivariate correlation analysis was performed to examine the relationship between repetitive behaviour scores from the Repetitive Behaviour Scale – Revised and intrinsic functional connectivity in ASD subjects. Compared to control subjects, ASD subjects displayed marked over-connectivity of the thalamus with several cortical sensory processing areas, as well as over-connectivity of the basal ganglia with somatosensory and motor cortices. Within the ASD group, significant correlations were found between functional connectivity patterns and total RBS-R scores as well as one principal component analysis-derived score from the RBS-R. These results suggest that thalamocortical resting-state connectivity is altered in individuals with ASD, and that resting-state functional connectivity is associated with ASD symptomatology.

KEYWORDS: autism spectrum disorder; repetitive behaviour; resting-state functional magnetic resonance imaging; intrinsic functional connectivity