Richard A.I. Bethlehem
857 King's College, CB2 1ST Cambridge
rb643@medschl.cam.ac.uk; +44 (0) 7551 808097

EDUCATION

2013 – Present: University of Cambridge: PhD in Psychiatry, supervisor; Prof. Simon Baron-Cohen, (submission date April 2017)

- Investigated brain connectivity in autism with a focus on neuroendocrine (hormonal) influences and gender differences.
- Investigated influence of hormone administration (oxytocin & testosterone) on brain connectivity and behaviour.
- Set up the first oxytocin administration study in the UK involving women with autism.
- Main techniques used: functional magnetic resonance imaging, electroencephalography, graph theory modelling, genomics, drug administration (oxytocin and testosterone), structural covariance analyses, network analyses, bioinformatics, independent component analyses and experimental psychology.
- Software qualifications: Matlab, Shell script, R, Python, NeuroImaging (SPM, FSL, AFNI, Fieldtrip, BVA2), visualization (Adobe Illustrator & Photoshop). See http://github.com/rb643 for some coding examples.

2010-2012: Utrecht University: MSc. in Neuroscience & Cognition (GPA 4.0, cum laude, top 2% of class of 50)

- Specialties/track on computational & social neuroscience.
- Internship at Helmholtz Institute (Utrecht University) using EEG and transcranial direct current stimulation to study menstrual cycle effects on brain and behaviour.
- Internship at the Autism Research Centre (University of Cambridge) to study gender differences in brain connectivity in individuals with autism using independent component analyses.
- Coursework included: biostatistics, fundamentals of neuroscience, social neuroscience.
- Thesis on oxytocin and brain physiology published in: Bethlehem et al. 2013, Psychoneuroendocrinology and awarded best master thesis of the graduate school of social sciences (2012).

2008-2010: Utrecht University: Cognitive Artificial Intelligence (GPA 3.8) – with a minor in Social Neuroscience

2007-2008: University of Amsterdam: M.A. in Philosophy (no GPA) – thesis on shared responsibility in bystander intervention

2003-2007: University of Amsterdam: B.A. in Philosophy (no GPA) – with a minor in Modern History and European Economics

POSITIONS

2016: Visiting Researcher, University of Aarhus – Department of Nuclear Medicine, Dr. Michael Winterdahl

- Basic training in PET imaging, autoradiography and development of new radioligand for in-vivo oxytocin receptor imaging.

2016: Visiting Researcher, University of Cape Town – Department of Psychiatry, Psycho Neuroimaging Group; Prof. Jack van Honk.

- Investigated influence of testosterone administration on functional brain networks during resting-state and fear processing using fMRI

2012-2013: Research Assistant, Utrecht University - Helmholtz Institute, Prof. Serge Dumoulin & Dr. Stefan van der Stigchel

- Project investigating visual processing in juvenile macular degeneration using eye-tracking and behavioural testing
- Used 7T fMRI imaging to explore input-output models of early visual processing across laminar profiles
- Project on plasticity of cortical networks important in social information processing by studying patients with selective bilateral amygdala damage (Urbach-Wiethe disease)

2011-2012: Visiting Researcher/Intern, Autism Research Centre, University of Cambridge

2010-2011: Research/Student Intern, Utrecht University, Helmholtz Institute

2010: Graduate Teaching Assistant/Research Assistant, Utrecht University, Helmholtz Institute – for the course Introduction to Cognitive Science and instructor for eye-tracking methods.

CURRENT ACTIVE COLLABORATIONS

- Prof. Jack van Honk, Utrecht University, The Netherlands & University of Cape Town, Cape Town
- Prof. Daniel Geschwind, Semel Institute, David Geffen School of Medicine, University of California, Los Angeles
- Dr. Daniel Margulies, Max-Planck-Institut für Kognitions- und Neurowissenschaften, Leipzig, Germany

- Prof. Edward Bullmore, Brain Mapping Unit, University of Cambridge, Cambridge, United Kingdom
- Dr. Michael V. Lombardo, Center for Applied Neuroscience, University of Cyprus, Nicosia, Cyprus
- Dr. Michael Winterdahl, Department of Nuclear Medicine, University of Aarhus, Aarhus, Denmark

PEER-REVIEWED PUBLICATIONS

- Huntenburg, J.M., Wagstyl, K., Steele, C.J., Funck, T., **Bethlehem, R.A.I.**, Foubet, O., Larrat, B., Borrell, V., Bazin, P.L. (2017). Laminar Python: tools for cortical depth-resolved analysis of high-resolution brain imaging data in Python. *Research Ideas and Outcomes* 3: e12346 https://doi.org/10.3897/rio.3.e12346
- **Bethlehem, R.A.I.**, Allison, C., Van Andel, E.M., Coles, A.I., Neil, K. & Baron-Cohen, S.; (2016). Does empathy predict altruism in the wild? *Social Neuroscience: http://doi/abs/10.1080/17470919.2016.1249944*.
- Auyeung, B., Lombardo, M.V., Heinrichs, M., Chakrabarti, B., Sule, A. Deakin, J., **Bethlehem, R.A.I.**, Dickens, L., Mooney, N., Sipple, J.A.N., Thiemann, P. & Baron-Cohen. (2015). Oxytocin increases eye contact during a real-time, naturalistic social interaction in males with and without autism. *Translational Psychiatry, e508.* doi: http://10.1038/tp.2014.14 PMID: 25668435
- **Bethlehem, R.A.I.**, Baron-Cohen S, Auyeung, B., van Honk, J. & Bos P.A. (2014). The Oxytocin Paradox. *Front. Beh. Neurosc.* 8:48. doi: http://doi.org10.3389/fnbeh.2014.00048 PMID: 24596548
- Van der Stighel, S. **Bethlehem, R.A.I.** (2014). The contribution of foveal activation to the oculomotor gap effect. *Neuroscience Letters, 583, pp. 126-129.* doi: http://doi.org/10.1016/j.neulet.2014.09.040 PMID: 25263787
- **Bethlehem, R.A.I.**, Dumoulin, S.O., Dalmaijer, E.S., Smit, M., Berendschot, T.T.J.M., Nijboer, T.C.W. & Van der Stigchel, S. (2014). Decreased fixation stability of the preferred retinal location in juvenile macular degeneration. PLoS One. doi: http://doi.org/10.1371/journal.pone.0100171 PMID: 24937090
- **Bethlehem, R.A.I.**, van Honk, J., Auyeung, B. & Baron-Cohen S. (2013). Oxytocin, brain physiology, and functional connectivity: a review of intranasal oxytocin fMRI studies. *Psychoneuroendocrinology*, *38, 7, pp. 962-974* doi: http://doi.org/10.1016/j.psyneuen.2012.10.011 PMID: 23159011
- Van der Stigchel, S., **Bethlehem, R.A.I.,** Klein, B.P., Berendschot, T.T.J.M., Nijboer, T.C.W. & Dumoulin, S.O. (2013). Macular degeneration affects eye movement behaviour during visual search. *Front. Psychol.* 4:579. doi: http://doi.org/10.3389/fpsyg.2013.00579 PMID: PMID: 24027546
- Van der Stigchel, S., De Vries, J.P., **Bethlehem, R.A.I.** and Theeuwes, J. (2011). A global effect of capture saccades. *Experimental Brain Research 210, 1, pp. 57-65.* PMID: 21374080

(google scholar link: https://scholar.google.com/citations?user=iapPGj8AAAAJ&hl=en)

FORTHCOMING PUBLICATIONS

- Warrier, V.,* **Bethlehem, R.A.I.*** & Baron-Cohen, S. The 'Reading the mind in the Eyes' Test (RMET) (*In press: Encyclopedia of Personality and Individual Differences, edited by Virgil Zeigler-Hill and Todd K. Shackelford*).
- **Bethlehem, R.A.I.***, Lombardo, M.V.*, Lai, M-C., Auyeung, B., Crockford, S.K., Deakin, J., Soubramanian, S., Sule, A., Kundu, P., Voon, V. & Baron-Cohen, S.; Oxytocin enhances intrinsic corticostriatal functional connectivity in women. (*In Press Translational Psychiatry, preprint available:* http://dx.doi.org/10.1101/068585).
- Warrier, V., **Bethlehem, R.A.I.,** Geschwind, D. & Baron-Cohen, S. The genetics of educational attainment, autism and schizophrenia show points of convergence (*Under review, preprint available:* http://dx.doi.org/10.1101/093575).
- **Bethlehem, R.A.I.***, Romero-Garcia, R.*, Mak, E., Bullmore, E.T. & Baron-Cohen S.; Structural covariance networks in children with autism or ADHD. (*Under review, preprint available: http://biorxiv.org/content/early/2017/02/21/110643*).
- Uzefovsky, F., **Bethlehem R.A.I**., Ruigrok, A.N.V., Holt, R., Spencer, M., Chura, L., Warrier, V., Chakrabarti, B., Bullmore, E.T., Suckling, J., Floris, D. & Baron-Cohen S. The Oxytocin Receptor Interacts with Autism Diagnosis to Predict Brain Activation in Response to The Eyes Test (*Under review*).
- Warrier, V. *, Romero-Garcia, R. *, Bullmore, E.T., Baron-Cohen, S. & **Bethlehem, R.A.I.**; Synaptic and transcriptionally dysregulated genes are replicably and selectively associated with cortical thickness differences in children with autism (*In preparation*)
- Heany, S.J., **Bethlehem, R.A.I.**, Van Honk, J., Bos, P.A., Stein, D.J., Terburg, D.; Testosterone Decouples the Orbitofrontal Cortex from Subcortical Inescapable Threat Reactivity. (*In preparation*).

*Authors contributed equally

COMMITTEE POSITIONS AND PROFESSIONAL MEMBERSHIPS

2015 – 2017: Chair, Graduate Student and Post-Doc (GRASP) Forum, Graduate School of Life Sciences, University of Cambridge

- Organized a course on data visualization
- Set-up an inter-departmental mentoring scheme between Post-Docs and graduate students in Life Sciences
- Conducted the first GSLS College satisfaction survey

2015 – 2017: Graduate Student Representative Faculty Board, School of Clinical Medicine – University of Cambridge
2015 – 2017: Graduate Student Representative School Council, School of Clinical Medicine – University of Cambridge
2015 – 2017: GRASP Representative Strategic Committee, Graduate School of Life Sciences – University of Cambridge
2015 – 2017: Organizing Committee - 1st & 2nd Annual Psychiatry Graduate Students Symposium (Trinity College, Cambridge)
2014 – 2017: Student Representative, Department of Psychiatry, (Cambridge)
2014 – 2016: Captain, Kings College Tennis Club

Memberships: King's College Cambridge, Society for Neuroscience, British Neuroscience Association, Organization for Human Brain Mapping, International Society for Autism Research, Cambridge Networks Network and Cambridge Big Data Strategic Research Initiative

GRANTS & RESEARCH SUPPORT

- MRC Flexible Funding Scheme, £2k (one-month PET imaging project at Aarhus University, 2016)
- MRC PhD Studentship, £27k (fees only award, 2013-2017)
- Pinsent Darwin Studentship, £26k (PhD Maintenance, 2013-2017)
- Cambridge Home & EU Studentship, £19k (PhD Maintenance, 2013-2016)
- MRC Skills & Partnership Training, £5k (two-month imaging project at the University of Cape Town, 2015-2016)
- Autism Research Trust, £130k (for oxytocin imaging study; £42k in 2013, £88k top-up in 2016)
- SBS Large Equipment Fund, £33k (to setup an EEG lab in the Department of Psychiatry at Cambridge; 2015)
- Hendrik Muller Vaderlandsch Fonds £1k (to support internship at the Autism Research Centre, 2011-2012)
- Erasmus Exchange Program £1k (to support internship at the Autism Research Centre, 2011-2012)

HONOURS & AWARDS

- Guarantors of Brain travel award to attend 5th Biennial Conference on Brain Connectivity and Resting-State fMRI (2016)
- Kings College Cambridge Travel award to attend Society for Neuroscience Annual meeting (SfN; 2016)
- Autism Research Trust travel award to attend International Meeting for Autism Research (IMFAR; 2016)
- Guarantors of Brain travel award to attend International Meeting for Autism Research (IMFAR; 2014)
- Fearnside Fund travel award to attend International Meeting for Autism Research (IMFAR; 2014)
- Best research master thesis of the Faculty of Social Sciences, Swanborn Prize, Utrecht University (2012)
- Graduated from Utrecht University "Cum Laude" (top 2% of my class of 50) – Neuroscience & Cognition (2012)
- Best student speaker, Mind the Brain symposium, Utrecht University (2011)

TEACHING EXPERIENCE

2014 – present: Student supervision: supervision of undergraduate interns on part 2 projects (4 students to date), supervising undergraduate students on research placement (3 students to date) & supervising international master students on internship (2 students to date).
2014 – present: Organised workshops for the Graduate School of Life Sciences (workshop on data visualization) and the Departments of Psychology and Psychiatry (workshop on OpenSesame experiment builder – a python based formerly open source toolkit for programming experiments for psychological sciences).
2013 – present: Supervisor for PBS (1, 2, 4 & 5) and Natural Sciences Tripos (Psychology & Neuroscience Papers) at the University of Cambridge (on average 2 groups of 2 to 3 students per term).
2012: Occasional workgroup teacher for the graduate course "Social Neuroscience" at Utrecht University (ca. 25 students per workgroup, I stood in for Prof. Jack van Honk when he was absent).
2010 – 2011: Workgroup teacher for the undergraduate course "Introduction to Cognitive Science" at Utrecht University (ca. 25 students per workgroup, 2 groups).
2010: Eyelink Instructor at Utrecht University, instructor to new interns and visiting researchers in using the Eyelink 1000 eye-tracking system.

CLINICAL TRAINING

WBIC MRI Safety Training (2011), Autism Diagnostic Observation Schedule (2011), Autism Diagnostic Interview – Revised (2014), Cambridge University Clinical School First Aid Training (2015), Clinical School Breakaway Training (2015), Cambridgeshire & Peterborough NHS Foundation Trust – Good Clinical Practice training (2014).

AD-HOC REVIEWER

JAMA Psychiatry, Molecular Psychiatry, Biological Psychiatry, Neuropsychopharmacology, Psychoneuroendocrinology, Frontiers in Human Neuroscience, Frontiers in Emotion Science, Frontiers in Behavioral Neuroscience, Brain Structure and Function, Social Neuroscience, PLoS One, Molecular Autism

POSTER PRESENTATIONS

- **Bethlehem, R.A.I.**, Lombardo, M.V., Lai, M-C., Auyeung, B., Crockford, S.K., Deakin, J., Soubramanian, S., Sule, A., Kundu, P. & Baron-Cohen, S.; Connectome resilience; effects of oxytocin administration on functional connectivity during resting-state fMRI in women. (2016). *Society for Neuroscience Annual Meeting*
- **Bethlehem, R.A.I.**, Heany, S.J., Van Honk, J., Bos, P.A., Stein, D.J., Terburg, D. Connectome resilience; effects of testosterone administration on functional connectivity during resting-state fMRI. (2016). *Fifth Biennial Conference on Resting-State and Brain Connectivity.*
- Uzefovsky, F., **Bethlehem R.A.I**., Ruigrok, A.N.V., Holt, R., Spencer, M., Chura, L., Warrier, V., Chakrabarti, B., Bullmore, E.T., Suckling, J., Floris, D. & Baron-Cohen S. The Oxytocin Receptor Interacts with Autism Diagnosis to Predict Brain Activation in Response to The Eyes Test (2016). *World Psychiatry Genomics Consortium.*
- **Bethlehem, R.A.I.,** Mak, E., & Romero-Garcia, R. Overlapping and distinct structural covariance networks in children with autism and ADHD. (2016). *Annual Meeting of the Organization for Human Brain Mapping (2016).*
- **Bethlehem, R.A.I.**, Kitzbichler, M.G., Freyberg, J., Ruzich., E, Crockford, S.K. & Baron-Cohen, S. (2016). Exploring atypical connectivity in Autism using Graph Theory and electroencephalography. *Poster at the International Meeting For Autism Resarch (IMFAR).*
- **Bethlehem, R.A.I.**, Lai, MC, Lombardo, M.V., Ruigrok, A.N.V., Auyeung, B., Suckling, J., Bullmore, E.T., MRC AIMS Consortium, Baron-Cohen, S. & Chakrabarti. B. (2014). Sex-modulated atypical resting-state functional connectivity in autism: an independent component analysis. *Poster at the International Meeting For Autism Research (IMFAR).*
- **Bethlehem, R.A.I.,** Terburg, D., Morgan, B., Montoya, E.R., Bos, P.A., De Gelder, B.L.M.F., Stein, D.J. & Van Honk, J. (2013). The human ventral amygdala maintains constant vigilance. *Poster at the 43rd Annual Meeting of the International Society for Psychoneuroendocrinology.*
- Del Rio, C., **Bethlehem, R.A.I.,** Van Oosterhout, J., Hofman, D. & Schutter, D.J.L.G. (2011). Frontal cortical EEG asymmetries are associated with trait aggression and reduced behavioural inhibition. *Poster at the 12th European Congress of Psychology.*

OTHER PUBLICATIONS

- Hofman, D., **Bethlehem**, **R.A.I.,** Kenemans, J.L. & Schutter, D.J.L.G. (2013). "*Transcranial direct current stimulation increases resting state EEG variability in the beta frequency range: A pilot study"* in: Our Biased Brain, Chapter 11, pp 157-169, PhD Thesis Dr. Dennis Hofman.
- **Bethlehem, R.A.I.** (2012) Protocol for Independent Component Analysis of Resting-State fMRI: the AIMS data set. Distributed within the Autism Research Centre and to people involved in the AIMS project [for internal use only].

PUBLIC TALKS

- "Love and aggression: how do hormones influence our brain and behaviour." – Pint of Science Cambridge, May 2016.
- "Graph theory analyses of testosterone modulated resting-state networks." – Psycho Neuroimaging Group, University of Cape Town, February 15th, 2016
- "Oxytocin, Autism and the Brain" – Keynote speaker Norfolk Psychiatry Faculty Away day, November 20th 2015
- "Exploring atypical connectivity in Autism using Independent Component Analysis" – ARClub, University of Cambridge, March 16th 2012