Linden Parkes, Ph.D.

K99/R00 Postdoctoral Research Fellow, University of Pennsylvania

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Research Interests

I am a **computational neuroscientist** working on understanding the biological basis of **psychiatric disorders**. My research uses **magnetic resonance imaging** and draws on tools from **network science** and **data science** to better understand the brain-phenotype relationships that are relevant to, and predictive of, mental illness.

Academic Positions

Postdoctoral Research Fellow — **Philadelphia, PA**
University of Pennsylvania, Department of Bioengineering — *July 2019 - present*
- Advisors: Prof. Dani S. Bassett, Associate Prof. Theodore D. Satterthwaite

Visiting Scholar — **Nijmegen, The Netherlands**
Donders Institute for Brain, Cognition and Behaviour — *Sept. 2018 - Oct. 2018*
- Advisors: Prof. Christian Beckmann, Dr. Andre Marquand

Education

Doctor of Philosophy — **Melbourne, Australia**
Monash University — *March 2014 - June 2019*
- Thesis: Mapping brain networks in health and mental disorder with structural and functional Magnetic Resonance Imaging
- Advisors: Prof. Murat Yucel, Prof. Alex Fornito, Dr. Ben Fulcher

Bachelor of Science (Honors) — **Melbourne, Australia**
Swinburne University of Technology — *2009 - 2013*
- Thesis: Mapping language processes using Magnetoencephalography.
- Advisor: Associate Prof. Conrad Perry
- Honors: First Class. Dux

Funding

Career Transition Awards

K99/R00 Pathway to Independence Award — *Sept. 2021 - 2026*
National Institute of Mental Health (NIMH)
- Project: Developing prognostic neuroimaging biomarkers of the psychosis spectrum using network control theory
- $1,424,194 USD

Fellowships & Scholarships

Young Investigator Award — *Jan. 2021 - Jan. 2023*
Brain & Behavior Research Foundation
- Project: Hybrid neurodevelopmental normative models for psychosis
- $70,000 USD

Monash University Postgraduade Publication Award — *2018*
Monash University
- $6,300 AUD

Monash University Graduate Research Scholarship — *2014 - 2018*
Monash University
- $20,000 AUD

Australian Postgraduate Award Research Scholarship — *2014 - 2018*
Australian Government
- $91,000 AUD

Grants

Innovations Connections Grant — *2016 - 2017*
Department of Industry, Innovation and Science, Australia

- $50,000 AUD
- Associate investigator

Travel Awards

Abstract Merit Award *2021*
Organization for Human Brain Mapping

- virtual, no monetary component

Abstract Merit Award *2020*
Organization for Human Brain Mapping

- $3,000 USD

Donders-Monash Erasmus Travel Award *2018*
Donders Institute for Brain, Cognition and Behaviour | Monash University

- $3,200 AUD

Future Leaders Travel Award *2015*
Monash Institute of Cognitive and Clinical Neurosciences

- $5,000 AUD

Select Publications (9 of 31)

Citations = 775, h-index = 15, i10-index = 18

For a complete list of my publications and preprints see my Google Scholar

Postdoc papers

1. **Parkes L**, Moore TM, Calkins ME, Cieslak M, Roalf DR, Wolf DH, Gur RC, Gur RE, Satterthwaite TD & Bassett DS (2021). Network controllability in transmodal cortex predicts positive psychosis spectrum symptoms. *Biological Psychiatry*.

2. **Parkes L**, Moore TM, Calkins ME, Cook PA, Cieslak M, Roalf DR, Wolf DH, Gur RC, Gur RE, Satterthwaite TD & Bassett DS (2021). Transdiagnostic dimensions of psychopathology explain individuals' unique deviations from normative neurodevelopment in brain structure. *Translational Psychiatry*.

3. **Parkes L**, Satterthwaite TD & Bassett DS (2020). Towards precise resting-state fMRI biomarkers in psychiatry: synthesizing developments in transdiagnostic research, dimensional models of psychopathology, and normative neurodevelopment. *Current Opinion in Neurobiology*.

- Invited opinion piece

PhD papers

4. **Parkes L**, Tiego J, Aquino K, Braganza L, Chamberlain SR, Fontenelle L, Harrison BJ, Lorenzetti V, Paton B, Razi A, Fornito A, & Yucel M (2019). Transdiagnostic variations in impulsivity and compulsivity in obsessive-compulsive disorder and gambling disorder correlate with effective connectivity in cortical-striatal-thalamic-cortical circuits. *NeuroImage*.

5. **Parkes L**, Fulcher B, Yucel M, & Fornito A (2018). An evaluation of the efficacy, reliability, and sensitivity of motion correction strategies for resting-state functional MRI. *NeuroImage*.

- *The 4th most cited paper in NeuroImage since 2018*

6. **Parkes L**, Fulcher B, Yucel M, & Fornito A (2017). Transcriptional signatures of connectomic subregions of the human striatum. *Genes, Brain and Behavior*.

- Amongst the top 20 downloaded from the journal in 2017

7. *Prochazkova L, ***Parkes L**, Dawson A, Youssef G, Ferreira GM, Lorenzetti V, Segrave RA, Fontenelle LF, & Yucel M (2017). Unpacking the role of self-reported compulsivity and impulsivity in obsessive-compulsive disorder. *CNS spectrums*.

**These authors contributed equally.*

Undergraduate papers

8. **Parkes L**, Perry C, & Goodin P (2016). Examining the N400m in affectively negative sentences. A magnetoencephalography study. *Psychophysiology*.

Book chapters

9. Segrave RA, Hendrikse J, & **Parkes L**, (2019). DBS, TMS and tDCS for obsessive compulsive disorder. In *A Transdiagnostic Approach to Obsessions, Compulsions and Related Phenomena*. Cambridge University Press

Teaching Experience

Teacher's Assistant — **Philadelphia, PA**
University of Pennsylvania, Department of Bioengineering — *2020*
- Class: Network Neuroscience
- Course evaluation score: 3.57/4

Guest Lecturer — **Philadelphia, PA**
University of Pennsylvania, Department of Bioengineering — *2019*
- Class: Network Neuroscience

Guest Lecturer — **Melbourne, Australia**
Monash University — *2017 - 2018*
- Class: Neuroscience Methods

Recitation Tutor — **Melbourne, Australia**
Swinburne University — *2014 - 2015*
- Class: Undergraduate Psychology

Recitation Tutor — **Melbourne, Australia**
Swinburne University — *2013*
- Class: Undergraduate Physiology

Research Employment

Research Assisstant — **Melbourne, Australia**
Monash Biomedical Imaging — *2018*
- Analysis of positron emission tomography (PET) data

Research Engineer — **Melbourne, Australia**
Torus Games & Cogstate — *2016 - 2017*
- Developed gamified cognitive tests for neuroscience research

Magnetoencephalography Technician — **Melbourne, Australia**
Swinburne Univerisity — *2013*
- Collection, preprocessing, and analysis of Magnetoencephalography (MEG) data

Open Science Contributions

Toolkits

Network Control — *Python*
`https://github.com/BassettLab/control_package`

Predictive Clinical Neuroscience — *Python*
`https://github.com/amarquand/PCNtoolkit`

Reproducibility

`https://github.com/lindenmp/neurodev_cs_predictive` — *Python*
- Code to reproduce results presented in *Parkes et al. (2021) Biological Psychiatry*

`https://github.com/lindenmp/normative_neurodev_cs_t1` — *Python*
- Code to reproduce results presented in *Parkes et al. (2021) Translational Psychiatry*

`https://github.com/lindenmp/rs-fMRI` — *Matlab*
- Code to reproduce results presented in *Parkes et al. (2018) NeuroImage* and *Parkes et al. (2019) NeuroImage*

Presentations

Oral

Network controllability in transmodal cortex predicts positive psychosis spectrum symptoms — *2021*
Organization for Human Brain Mapping
- 3-minute summary available on YouTube

Network Neuroscience — *2021*
DataPhilly
- Invited talk

- Available on YouTube

Average controllability better predicts cognition when compared to strength *2020*
Organization for Human Brain Mapping

- Symposium

Psychopathology explain individual's unique deviations from normative neurodevelopment *2020*
Organization for Human Brain Mapping

Dimensional psychiatry in corticostriatal circuits: lessons learnt from resting-state fMRI data *2018*
University of Pennsylvania

- Invited talk

Transdiagnostic biomarkers in psychiatry *2018*
Centre of Excellence for Integrative Brain Function, Melbourne, Australia

- Invited talk

Confounds in rs-fMRI processing *2016*
Swinburne Univerisity, Melbourne, Australia

- Invited talk

Transcriptional signatures of connectomic subregions of the human striatum *2015*
Students of Brain Research, Melbourne, Australia

Examining the N400m in affectively negative sentences. A magnetoencephalography study *2013*
Australasian Cognitive Neuroscience Conference

Posters (first-author)

Network controllability in transmodal cortex predicts positive psychosis spectrum symptoms *2021*
Organization for Human Brain Mapping

Network controllability in transmodal cortex predicts positive psychosis spectrum symptoms *2021*
Society of Biological Psychiatry

Psychopathology explain individual's unique deviations from normative neurodevelopment *2020*
Organization for Human Brain Mapping

Impulsivity and compulsivity correlate with effective connectivity in corticostriatal circuits *2019*
Organization for Human Brain Mapping

Impulsivity and compulsivity correlate with effective connectivity in corticostriatal circuits *2018*
Australasian Cognitive Neuroscience Conference

Evaluating the efficacy and sensitivity of motion correction strategies for rs-fMRI *2018*
Organization for Human Brain Mapping

Efficacy, reliability, and sensitivity of motion correction strategies for resting-state functional MRI *2017*
IEEE International Symposium on Biomedical Imaging

Efficacy, reliability, and sensitivity of motion correction strategies for resting-state functional MRI *2017*
Students of Brain Research

Academic Service

Journal Peer Review

- Nature Protocols, NeuroImage, Human Brain Mapping, Network Neuroscience, Scientific Reports, Biological Psychiatry, Psychological Medicine, Neuropsychologia, Developmental Cognitive Neuroscience, NeuroImage: Clinical, Psychiatry Research: Neuroimaging, Harvard Review of Psychiatry, International Gambling Studies, Journal of Cerebral Blood Flow & Metabolism

Committees

Organization for Human Brain Mapping, Student and Postdoc Special Interest Group *2019 - 2021*
Treasurer

Australasian Cognitive Neuroscience Society, Early Career Researchers Committee *2017*
Committee Member

Australasian Cognitive Neuroscience Society, Executive Committee *2017*
ECR Representative

Students of Brain Research *2016*
Treasurer

Supervision & Mentorship

Ashlea Segal *2018 - present*
Graduate Student, Monash University

Tayla Currie *2018*
Undergraduate Honors Student, Monash University

John Fallon *2017*
Undergraduate Honors Student, Monash University

Luisa Prochazkova *2016*
International Visiting Scholar, Monash University

Kristina Sabaroedin *2016*
Undergraduate Honors Student, Monash University

Lauren Den Ouden *2016*
Undergraduate Honors Student, Monash University

Stuart Oldham *2016*
Undergraduate Honors Student, Monash University

Danielle Amiet *2016*
Undergraduate Honors Student, Monash University

Outreach & Community Engagement

Neuroimaging Best Practices Beyond Open Science *2021*
Organization for Human Brain Mapping, Student and Postdoc Special Interest Group

- Moderator

Link with Mentors *2021*
Organization for Human Brain Mapping, Student and Postdoc Special Interest Group

- Moderator

International Mentoring Programme *2021*
Organization for Human Brain Mapping, Student and Postdoc Special Interest Group

- Mentor

Network Control Theory for Neuroscientists, Education Workshop *2020*
Organization for Human Brain Mapping

- Organizer, presenter

Link with Mentors *2020*
Organization for Human Brain Mapping, Student and Postdoc Special Interest Group

- Moderator

NeuroDay *2018*
Methodist Ladies' College, Melbourne, Australia

- Organizer, presenter

BMH Mentor Forum *2018*
Brain & Mental Health Research Hub, Monash University

- Organizer, mentor

MBI Student Forum *2014 - 2015*
Monash Biomedical Imaging, Monash University

- Organizer, mentor, presenter