Liangfang Li

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Education

Sun Yat-sen University | Double First Class University, Project 985 & 211 — Guangzhou, China

Ph.D. in Psychology — Aug 2018 – Dec 2024

- Awards: National scholarship for doctoral students, Outstanding doctoral thesis award
- **Research interests**: Psychiatry, Connectome, Precision brain mapping, Personalized neuroscience, Computational neuroscience
- Thesis title: Research on Individualized Brain Functional Networks and Their Prediction of Major Depressive Disorder Severity
- Supervisor: Dr. Zhengjia Dai, Sun Yat-sen University

B.S. in Psychology — Aug 2014 – Jun 2018

Publications

Journal Articles ($^+$ indicates co-first author, * indicates correspondent author. Listed by author contribution)

1. **Li, L.**, Wei, Y., Zhang, J., Ma, J., Yi, Y., Gu, Y., ... & Dai, Z.* (2021). Gene expression associated with individual variability in intrinsic functional connectivity. *Neuroimage*, 245, 118743. [doi]
2. **Li, L.**, Li, L. M. W., Ma, J., Lu, A., & Dai, Z.* (2023). The relationship between personality traits and well-being via brain functional connectivity. *Journal of Happiness Studies*, 24(6), 2127–2152. [doi]
3. Wang, Y.$^+$, Wu, R.$^+$, **Li, L.**$^+$, Ma, J., Yang, W., & Dai, Z.* (2022). Common and distinct neural substrates of the compassionate and uncompassionate self-responding dimensions of self-compassion. *Brain Imaging and Behavior*, 16(6), 2667-2680.[doi]
4. Hu, R.$^+$, Yu, M.$^+$, **Li, L.**$^+$, He, H., Ma, J., Gu, Y., Dai, Z.* (2025). The specificity of Metacognition Questionnaire-30-Subdimensions findings from connectome-based predictive modeling. *Depression and Anxiety*, (Accepted).
5. Gu, Y., **Li, L.**, Zhang, Y., Ma, J., Yang, C., Xiao, Y., Shu, N., Can, C., Lin, Y., & Dai, Z.* (2022). The overlapping modular organization of human brain functional networks across the adult lifespan. *Neuroimage*, 253, 119125.[doi]
6. Chen, J.*, **Li, L.**, & Zhang, D. (2021). Students With Specific Difficulties in Geometry: Exploring the TIMSS 2011 Data With Plausible Values and Latent Profile Analysis. *Learning Disability Quarterly*, 44(1), 11-22.[doi]
7. Ma, J., Chen, X., Gu, Y., **Li, L.**, Cam-CAN, Lin, Y., & Dai, Z.* (2023). Trade-offs among cost, integration, and segregation in the human connectome. *Network neuroscience*, 7(2), 604–631.[doi]
8. Xiao, Y.$^+$, Lin, Y.$^+$, Ma, J., Qian, J., Ke, Z., **Li, L.**, Yi, Y., Zhang, J., Cam-CAN, & Dai, Z.* (2021). Predicting visual working memory with multimodal magnetic resonance imaging. *Human brain mapping*, 42(5), 1446–1462.[doi]
9. Yu, M.$^+$, Yuan, L.$^+$, He, H., Ma, J., Gu, Y., **Li, L.**, Dai, Z.* (2024). Neural Basis of Negative Automatic Thoughts and Their Relationship with Depression and Stress Perception: Evidence from Resting-State fMRI. *Chin J Clin Psychol*, (Accepted).

In Preparation

10. **Li, L.**, Lin, Y., & Dai, Z.* (manuscript drafted). Individualized brain functional network improves prediction of depressive symptoms in major depressive disorder patients.
11. Gu, Y., Lin, Y., **Li, L.**, Ma, J., Wei, S., Alzheimer's Disease Neuroimaging Initiative, Dai, Z.* (under review). Disrupted Overlapping Module Organization in Alzheimer's Disease.

Conference Presentations

1. **Li, L.**, Qian, J., Lin, Y., & Dai, Z.* (2025). *Individualized Functional Connectome Enhances Severity Prediction in Major Depressive Disorder (Merit Abstract Award).* The 31st Organization for Human Brain Mapping (OHBM) Annual Meeting, 26-30 June, Brisbane, Australia.

2. **Li, L.**, Ma, J., Gu, Y., Chen, X., Qian, J., Lin, Y., & Dai, Z.* (2024). *Enhancing Prediction for Depressive Symptoms in Subthreshold Depression by Personalized Parcellation.* The 30th Organization for Human Brain Mapping (OHBM) Annual Meeting, 23-27 June, Korea, Seoul.
3. **Li, L.**, Li, L. M. W., Ma, J., Lu, A., & Dai, Z.* (2023). *The Relationship between Personality Traits and Well-Being via Brain Functional Connectivity.* The 29th Organization for Human Brain Mapping (OHBM) Annual Meeting, 23-27 June, Montréal, Canada.
4. **Li, L.**, Zhang J., Ma, J., Qian, J., & Dai, Z.* (2020). *Variability of Functional Connectivity Underlies Individual Differences in Delay Gratification.* The 26th Organization for Human Brain Mapping (OHBM) Annual Meeting, 23-27 June, Montréal, Canada.

Research Experiences

Note. [x] refers to the item in the publication list.

Prof. Zhengjia Dai's Lab, Sun Yat-sen University Jun 2019 – present

Predicting Depression Severity of MDD Patients Using Individualized Brain Functional Networks [9] May 2023 – present

- Utilized surface-based cortical analysis tools proficiently for brain cortical reconstruction and imaging metrics extraction.
- Achieved individual-specific brain region segmentation using innovative individualized parcellation algorithms and constructed individualized functional networks.
- Employed various machine learning algorithms to predict depressive symptoms using functional connectivities (FCs) as imaging features.
- Compared the prediction performance of the two types of FC (traditional group-level parcellation VS. individualized parcellation).
- **Findings**: 1. Topological characteristics of individualized region are significantly associated with depression severity; 2. individualized functional networks significantly improved the prediction accuracy of depression severity in MDD patients, comparing to using traditional group-level parcellation.

Spatial Map, Behavioral Correlates, and Genetic Basis of Individual Variability in Functional Networks [1] Oct 2019 – Nov 2021

- Quantified ROI-level and network-level individual variability in functional connectivity and mapped the variability across whole brain.
- Conducted meta-analyses to explore the behavioral correlates (e.g., motor and cognitive control) for the spatially heterogeneous variability map.
- Performed transcriptome-neuroimaging spatial correlation analyses and gene enrichment analyses to investigate genetic bases underlying the spatial heterogeneity observed in the variability map.
- **Findings**: 1. Functional connectivity variability was greater in the association cortex compared to primary cortex; 2. Ranging from the low variability in the primary cortex to the high variability in the association cortex spanned a continuum from primary to higher-order cognitive functions; 3. the variability map demonstrated significant spatial associations with gene expression profiles related to human brain evolution.

Explore the Relationship between Personality Traits and Well-being via Brain Functional Connectivity [2] Nov 2022 – Jun 2023

- Implemented canonical correlation analysis to identify multi-trait profile highly correlated with multi-faceted well-being.
- Used network-based statistical analyses to indetify functional subnetworks significantly associated with well-being.
- Conducted graph theoretic analyses and mediation analyses to investigate whether the information communication efficiency (e.g., global network efficiency) of well-being-related brain networks (M) mediated the association between personality (X) and well-being (Y).
- **Findings**: 1. A multi-trait profile characterized by higher extraversion, conscientiousness but lower neuroticism was most strongly correlated with higher levels of well-being; 2. the communication efficiency of well-being-related brain networks partially mediated the relationship between personality and well-being.

Compare Neural Substrates of Compassionate and Uncompassionate Dimensions of Self-compassion [3] Dec 2021 – Sep 2022

- Implemented voxel-based morphometric and functional analyses to measure the gray matter volume (GMV) and the amplitude of low-frequency fuctuation (ALFF) in healthy college students.
- Conducted voxel-wise correlation analyses to explore how structural and functional brain regions were related to compassionate and uncompassionate dimensions of self-compassion.
- Employed coincidence analysis to uncover the commonality and specificity of neural substrates underlying these two dimensions.

- Performed mediation analyses to examine the potential indirect efect from neural basis (X) to emotional health (Y) through self-compassion dimensions (M).
- **Findings**: 1. Identified certain dimension-shared and dimension-specific structural and functional neural underpinnings; 2. the uncompassionate dimension, but not the compassionate dimension, of self-compassion significantly mediated the associations between neural substrates and emotional health.

Professional Experiences

Teaching Assistant

- Introduction to Cognitive Neuroscience, Sun Yat-sen University 2020, 2022
- Neuroimaging Methodologies and Mental Health, Sun Yat-sen University 2021
- Advanced Magnetic Resonance Imaging Data Analysis (graduate level), Sun Yat-sen University 2020
- Principles of Educational Assessment, Sun Yat-sen University 2019
- Special Topics on Psychometrics (graduate level), Sun Yat-sen University 2018

Skills

Programming: MATLAB, Python, R, MySQL, Mplus, SPSS, Git

Neuroimaging Data Processing

- Cortical Analysis: FreeSurfer, FSL, fMRIPrep, BIDS
- Voxel-based Analysis: SPM, DPABI, GRETNA, BrainNet Viewer, MRIcron

Languages: Chinese (Native), English

Referees

Dr. Zhengjia Dai: daizhengj@mail.sysu.edu.cn; Department of Psychology, Sun Yat-sen University

Dr. Ying Lin: linying23@mail.sysu.edu.cn; Department of Psychology, Sun Yat-sen University

Dr. Yongbin Wei: yongbin.wei@bupt.edu.cn; School of Artificial Intelligence, Beijing University of Posts and Telecommunications