Zhichao Xia, Ph.D.

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School of Systems Science | National Key Laboratory of Cognitive Neuroscience and Learning & IDG/McGovern Institute for Brain Research | Center for Collaboration and Innovation in Brain and Learning Sciences, Beijing Normal University

Education & Training Background

- Nov 2017–present
  Postdoctoral researcher; School of Systems Science, Beijing Normal University
- Sept 2013–Jun 2017
  Ph.D. in Psychology; School of Brain and Cognitive Sciences, Beijing Normal University
- Nov 2014–Dec 2016
  Visiting Scholar; Department of Psychiatry and Weill Institute for Neurosciences, University of California, San Francisco
- Sept 2010–Jun 2013
  M.S. in Cognitive Neuroscience; School of Brain and Cognitive Sciences (master–doctor continuous study), Beijing Normal University
- Sept 2006–Jun 2010
  B.S. in Applied Psychology; Department of Psychology, Qingdao University

Research Interest

- Reading Acquisition: (i) The neurocognitive mechanism underlying reading development and how it is affected by genes, environments, and experiences; (ii) Manifestations of reading disorder at the behavioral and brain levels; (iii) Developing accurate and easy-to-use classification tools for identifying reading disorder with multi-modal neuroimaging data.
- Speech Perception: (i) Neuroanatomical and neurofunctional correlates of categorical perception of lexical tone in native speaker of Chinese and in those who learn Chinese as a second language; (ii) Neurobiological mechanisms underlying auditory hallucination.

- Brain Plasticity: (i) Effects of visual deprivation (e.g., blindness) and specific experience (e.g., musical training) on cortical reorganization.

Software

- Proficient in structural and functional MRI data analysis with AFNI, SPM, FSL, FreeSurfer, SurfStat, CAT, CONN Toolbox, ExploreDTI, Trackvis, etc.
- Proficient in statistics with SPSS and R
- Proficient in behavioral and fMRI experimental design and familiar with stimulus presentation software including E-Prime and PsychoPy

Research Experience

- Jun 2018–present
  Cortical reorganization in learning Chinese as a second language: a longitudinal neuroimaging study. (fMRI experimental design, data collection, data analysis, paper writing)
- Sept 2017–present
  Audiovisual integration in Chinese children with and without dyslexia. (research design, data collection, data analysis, paper writing)
- Oct 2015–present
  How brain networks reorganize driven by visual deprivation, maturation, vocational training and their interaction. (data analysis, paper writing)
- Sept 2015–Dec 2016
  Understanding reading acquisition through immersion in foreign languages. (MRI scan assistant and data analysis)
- Nov 2014–Dec 2016
  Intergenerational transmission of impaired reading(-related) skills and neural characteristics. (data analysis and paper writing)
- May 2012–Sept 2014
  Neural deficits in Chinese dyslexic children: A multi-modal neuroimaging study. (participants recruit, behavior and MRI data collection, data analysis, and paper writing)
- Sept 2012–Nov 2014
  How Mandarin speakers process lexical tone: An fMRI study. (study design,

fMRI data collection and analysis, paper writing)

- Jul 2011–May 2012
  Neural correlates of morphological processing in normal Chinese population: Evidence from ERP and fMRI studies. (materials preparation, neuroimaging data collection, and fMRI data analysis)
- Sept 2010–June 2011
  The role of specific brain areas plays in Chinese character writing: Evidence from perioperative dysgraphic cases. (behavior task design, data collection and analysis)

Membership

- Society for the Neurobiology of Language (2019–present)
- Society for Neuroscience (2019–present)
- Organization for Human Brain Mapping (2017–present)
- Cognitive Neuroscience Society (2016–present)
- Chinese Psychological Society (2010–present)

Manuscript Reviewing

- Cerebral Cortex
- The Journal of Neurosciences
- Brain Research

Publication

Peer-Reviewed Paper

1. Cui, X., **Xia, Z.** (co-first author), Pan, J., McBride, C., Shu, H., (2020). Shared neural substrates underlying reading and visual matching: A longitudinal investigation. Front Hum Neurosci, 14(445).
2. Zou, L., Packard, J. L., **Xia, Z.**, Liu, Y., & Shu, H. (2019). Morphological and Whole-Word Semantic Processing Are Distinct: Event Related Potentials Evidence from Spoken Word Recognition in Chinese. Front Hum Neurosci, 13(133).

3. Lu, X., Li, T., **Xia, Z.**, Zhu, R., Wang, L., Luo, Y.-J., . . . Krueger, F. (2018). Connectome-based model predicts individual differences in propensity to trust. Human Brain Mapping, 40, 1942-1954.
4. Zhou, W., **Xia, Z.**, Georgiou, G. K., & Shu, H. (2018). The Distinct Roles of Dorsal and Ventral Visual Systems in Naming of Chinese Characters. Neuroscience, 390, 256-264.
5. **Xia, Z.**, Zhang, L., Hoeft, F., Gu, B., Gong, G., & Shu, H. (2018). Neural correlates of oral word reading, silent reading comprehension, and cognitive subcomponents. International Journal of Behavioral Development, 42(3), 342-356.
6. Li, Y., Zhang, L., **Xia, Z.**, Yang, J., Shu, H., & Li, P. (2017). The Relationship between Intrinsic Couplings of the Visual Word Form Area with Spoken Language Network and Reading Ability in Children and Adults. Front Hum Neurosci, 11.
7. Black, J. M., **Xia, Z.** (co-first author), & Hoeft, F. (2017). Neurobiological bases of reading disorder part II: The importance of developmental considerations in typical and atypical reading. Language and Linguistics Compass, 11(10), e12252.
8. **Xia, Z.**, Hancock, R., Hoeft, F. (2017). Neurobiological bases of reading disorder Part I: Etiological investigations. Language and Linguistics Compass, 11(4), e12239.
9. Zhou, W., Wang, X., **Xia, Z.**, Bi, Y., Li, P., & Shu, H. (2016). Neural Mechanisms of Dorsal and Ventral Visual Regions during Text Reading. Front Psychol, 7(1399).
10. **Xia, Z.**, Hoeft, F., Zhang, L., & Shu, H. (2016). Neuroanatomical anomalies of dyslexia: Disambiguating the effects of disorder, performance, and maturation. Neuropsychologia, 81, 68-78.
11. Cui, Z., **Xia, Z.** (co-first author), Su, M., Shu, H., & Gong, G. (2016). Disrupted white matter connectivity underlying developmental dyslexia: A machine learning approach. Human Brain Mapping, 37(4), 1443-1458.
12. Zou, L., Packard, J. L., **Xia, Z.**, Liu, Y., & Shu, H. (2015). Neural Correlates of Morphological Processing: Evidence from Chinese. Front Hum Neurosci, 9.
13. Zhou, W., **Xia, Z.**, Bi, Y., & Shu, H. (2015). Altered connectivity of the dorsal and ventral visual regions in dyslexic children: a resting-state fMRI study. Front Hum Neurosci, 9, 495.
14. Wang, J., Wang, P., **Xia, Z.**, Liu, J., Quan, W., Tian, J., . . . Dong, W. (2015). Lexical and sub-lexical reading skills and their correlation to clinical symptoms in

young Chinese patients with schizophrenia. Psychiatry Research, 230(3), 919–923.

15. **Xia, Z.,** Hong, T., Zhang, L., & Shu, H., (2014). Application of Auditory Brainstem Response (ABR) in Speech Perception Research. Advances in Psychological Science, 22(1), 14–26.
16. Zou, L., Desroches, A. S., Liu, Y., **Xia, Z.**, & Shu, H. (2012). Orthographic facilitation in Chinese spoken word recognition: An ERP study. Brain Lang, 123(3), 164–173.

Manuscript in progress

- Zou, L., **Xia, Z.** (correspondence), Zhang, W., Shu, H. (under review) Brain responses during auditory word recognition vary with reading ability in Chinese children.
- **Xia, Z.**, Wang, C., Hancock, R., Vandermosten, M., Hoeft, F., (under review). Development of thalamus mediates paternal age effect on offspring reading: A preliminary investigation.
- Zhou, W., **Xia, Z.**, Georgiou. G., Shu, H., (under review). Shared and unique functional connectivity underpinning RAN and character reading in Chinese.
- **Xia, Z.** *, Yang, T. *, Cui, X., Hoeft, F., Liu, H., Shu, H., Liu, X., (under review). Neurofunctional basis of audiovisual integration of characters and pinyin in typical Chinese children.
- **Xia, Z.** *, Yang. T. *, Cu, X., Hoeft, F., Liu, H., Liu, X., Shu, H., (under review). Distinct relationships between brain features of audiovisual integration and reading components in Chinese children with and without dyslexia.
- Zhang, L., Xu, G., **Xia, Z.**, Pang, W., Zhang, Y., Shu, H., Li, P., (under review) Neurocognitive components of absolute pitch proficiency in blind musicians.

Presentation

Oral presentation

- 2021/03/06 ARWA (Association for Reading and Writing in Asia) Annual Conference 2021
  Title: Brain responses in auditory word recognition vary with reading

ability in Chinese children

- 2019/10/25 @ UMich; 2019/10/29 @ UConn; 2019/10/30 @ Haskins
  Title: Neural correlates of audio-visual integration in Chinese children with and without developmental dyslexia

Poster at conference

- **Xia, Z.**, Cui, X., Yang, T., Liu, X., Shu, H., (2019) Neurocognitive basis of audiovisual integration in Chinese dyslexic children. Poster in 25th Annual Meeting of the Organization of Human Brain Mapping, Rome, Italy
- Cui, X., **Xia, Z.**, Shu, H., (2019) Neuroanatomical signature of the Chinese Character Spurt. Poster in 25th Annual Meeting of the Organization of Human Brain Mapping, Rome, Italy
- **Xia, Z.**, Yang, T., Cui, X., Shu, H., Liu, X., (2019) Neural mechanisms underlying audio-visual integration in Chinese young children. Poster in 26th CNS Annual Conferences, San Francisco, United States
- Kepinska, O., Oliver, M., **Xia, Z.**, Marks, R., Zekelman, L., Caballero, J., Hancock, R., Haft, S.L., Duong, P., Uchikoshi, Y., Kovelman, I., Hoeft, F., (2019). Bilingualism modulates L1 word processing in the developing brain. Poster in 26th CNS Annual Conferences, San Francisco, United States
- Kepinska, O., Oliver, M., **Xia, Z.**, Marks, R., Zekelman, L., Hancock, R., Haft, S., Duong, P., Uchikoshi, Y., Kovelman, I., Hoeft, F., (2018). Bilingualism modulates L1 word processing in the developing brain. Poster in 10th Anniversary of the Society for the Neurobiology of Language (SNL), Quebec, Canada
- **Xia, Z.**, Pang, W., Shu, H., Zhang, L., (2018). Neuroanatomical correlates of absolute pitch in blind musicians: A preliminary study. Poster in 24th Annual Meeting of the Organization of Human Brain Meeting, Singapore, Singapore
- Cui, X., **Xia, Z.**, Ramus, F., Shu, H., (2018). Morphometry of LvOT accounts for overlap between visual-phonological mapping development and reading. Poster in 24th Annual Meeting of the Organization of Human Brain Meeting, Singapore, Singapore
- Pang, W., **Xia, Z.**, Shu, H., Zhang, L., (2018). Neural correlates of voice recognition are shaped by visual deprivation: a resting-state fMRI study. Poster in 24th Annual Meeting of the Organization of Human Brain Meeting, Singapore, Singapore

- Marks, R., **Xia, Z.,** Hancock, R., Uchikoshi, Y., Kovelman, I., Hoeft, F., (2017) Bilingual proficiency associated with cortical responses during language processing. Poster in 24th CNS Annual Conference, San Francisco, United States
- **Xia, Z.**, Wang, C., Vandermosten, M., Hancock, R., Hoeft, F., (2017). Advanced paternal age effects on offspring academic ability: the role of thalamic maturation links APA and reading. Poster in 24th CNS Annual Conference, San Francisco, United States
- Wang, Y., **Xia, Z.**, Shu, H., & Jiang, T., (2013). Where in our brain are crucial for writing Chinese character: Evidence from the perioperative dysgraphic cases. Poster in Neuroscience of Communication: Function, Structure, and Plasticity, Leipzig, German

Funding

- Investigating neural mechanism underlying developmental dyslexia via a joint application of reading-level matched design and machine learning algorithm
  Chinese Postdoctoral Science Foundation, Special Program (2019T120062)
  Period: 2019/7-2021/10
  Role: Principal Investigator
  Total costs: CNY 150,000 (USD 21,500)
- Neural mechanisms underlying multi-level phonological processing skills and impairments in Chinese children with developmental dyslexia
  Chinese Postdoctoral Science Foundation, General Program (2018M641235)
  Period: 2018/12-2021/10
  Role: Principal Investigator
  Total costs: CNY 50,000 (USD 7,150)

Honors and Awards

- Chinese Postdoctoral Science Foundation, Exchange Program 2018-2019
  CNY 30,000
- Chinese Scholarship Council Scholarship, Visiting Program 2014-2016
  USD 40,800