

CAREER OBJECTIVES	Cognitive Science PhD Student with 4 years of experience carrying out data-driven research projects and algorithm design on high-dimensional, community-based neurodevelopmental datasets. Intent on a career that applies data and data driven approaches to improve real-world outcomes.
EDUCATION	<p><b>University of California, San Diego</b> Ph.D. in Cognitive Science, 2017 - Present, GPA: 3.91 <b>San Diego State University</b>, San Diego, California M.S. in Psychology, Graduated 2016, GPA. 3.96</p> <p><b>University of Illinois Urbana-Champaign</b>, San Diego, California B.S. in Psychology, Graduated 2013, GPA. 3.85</p>
RESEARCH EXPERIENCE	<p><b>University of California, San Diego</b> <i>Graduate Researcher</i> <b>Sept 2017 - Present</b> Developed a novel Bayesian prediction model for large-scale neuroimaging data, which doubled the predictive power of functional neuroimaging phenotypes on children's cognitive and mental health outcomes when compared to the standard analysis pipeline and SVR. Publish a paper in the Cerebral Cortex journal (2020).</p> <p>Conceptualized an independent research project on investigating the effects of social and economical environments on children's brain and cognitive development. With the largest neurodevelopmental study in the U.S., the Adolescent Brain Cognitive Development Study, this study showed that socioeconomic factors have a global effect on brain development. Such effect is not localized to the emotional processing brain regions.</p> <p><b>San Diego State University</b> <i>Graduate Researcher</i> <b>2014 - 2016</b> Completed a master's thesis examining the network connectivity of the face processing network of the brain and how it contributes to social deficits in children with ASD. Analyzed high-dimensional resting-state functional MRI images to quantify the behavioral relevance of the atypical connectivity of the face processing network.</p>
SELECTED PROJECTS	<p><b>Causal inference on social and emotional processes in children</b> Surveyed the utility of causal inference methods, including causal random forest, cross-lagged panel analysis, SEM, and Direction of Causation (DoC), on community-based developmental samples. Implemented SEM and DoC models on a twin dataset. Concluded a bidirectional causal relationship between parent-child relationship and the presence of social and emotional problems in children.</p> <p><b>Maximizing the predictive power of MRI images using supervised machine learning</b> Modeling the predictive effects of neuroimaging data on behavioral traits using machine learning algorithms including neural networks, SVR, GAMM, and random forests with boosting and stacking. Concluded that only 1% of crystallized intelligence could be explained by the structural differences in the brain.</p>
PROGRAMMING & TECHNICAL SKILLS	<p>Proficient in R, Python, and MATLAB for data mining and statistical learning</p> <p>Specialties: modeling neurodevelopment, experimental design, applied statistics, multivariate methods</p>
JOURNAL PUBLICATIONS	<p>Palmer, C. E., <b>Zhao, W.</b>, Loughnan, R. J., Fan, C. C., Thompson, W. K., Dale, A. M., &amp; Jernigan, T. L. (2021). Fluid and crystallised intelligence are associated with distinct regionalisation patterns of cortical morphology. (Accepted at Cerebral Cortex).</p> <p><b>Zhao, W.</b>, Palmer, C. E., Thompson, W. K., Chaarani, B., Garavan, H. P., Casey, B. J., ... &amp; Fan, C. C. (2020). Individual Differences in Cognitive Performance Are Better Predicted by Global Rather Than Localized BOLD Activity Patterns Across the Cortex. Cerebral Cortex. bhaa290.</p> <p>Palmer, C. E., <b>Zhao, W.</b>, et al (2019). Determining the association between cortical morphology and cognition in 10,145 children from the Adolescent Brain and Cognitive Development (ABCD) study using the MOSTest. doi: <a href="https://doi.org/10.1101/816025">https://doi.org/10.1101/816025</a></p> <p>Jao Keehn, R. J., Sanchez, S. S., Stewart, C. R., <b>Zhao, W.</b>, Grenesko, E. L., Keehn, B., &amp; Müller, R. A. (2016). Impaired downregulation of visual cortex during auditory processing is associated with autism symptomatology in children and adolescents with Autism Spectrum Disorder. Autism Research.</p>

**Zhao, W.**, Gonzalez, M., Jernigan, T. (2021). Minimal Association was Observed Between SES and Amygdala and Hippocampal Development in U.S. Children. Flash talk presentation at Society for Research in Child Development 2021 virtual meeting.

**Zhao, W.**, Gonzalez, M., Jernigan, T. (2020). No association was observed between SES and the relative volume of the amygdala and the hippocampus. Poster presentation at Flux 2020 virtual meeting. Abstract: 1-H-62.

**Zhao, W.**, Palmer, C., Thompson, W., Jernigan, T., Dale, A., Fan, CC. (2020). The Bayesian Polyvertex Score: capturing the distributed effect sizes of imaging phenotypes for improved behavioral prediction. Poster presented at Organization for Human Brain Mapping 2020 virtual conference. Virtual poster number: 1107.

**Zhao, W.**, Thompson, T., Akshoomoff, N., Brown, T.T., Dale, A. M., Jernigan, T. L. (2018, Nov). Developmental trajectories of MR diffusion parameters in major brain fiber tracts: a longitudinal study with multiple measurements from ages 5 to 12. Poster presented at the Society of Neuroscience 2018 Meeting, San Diego, CA.

**Zhao, W.**, Fishman, I., Legenkaya, A., Nair, S., Sullivan, M., Gao, Y., Berkebile, M., Müller, R.-A. (2016, March). Atypical intrinsic functional connectivity of FFA is associated with social communication deficit in ASD. In Autism. Oral presentation conducted at the Student Research Symposium 2016 of San Diego State University, San Diego, CA.