# Zumin Chen, B.A., M.Ed.

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## EDUCATION

**Harvard University, Graduate School of Education** — Cambridge, MA
*Master's in Education (M.Ed.)* — Fall 2022 – May 2023
*Human Development and Education: Early Childhood Concentration*
Cumulative GPA: 3.96

**University of Virginia** — Charlottesville, VA
*Bachelor of Arts, Double Major* — Fall 2019 – May 2022
*B.A. in Cognitive Science: Neuroscience Concentration and B.A. in Psychology*
Cumulative GPA:3.878; Cognitive Neuroscience GPA: 3.971; Psychology GPA: 3.951

**Boston College** — Chestnut Hill, MA
*Transferred to University of Virginia after 1 year* — Fall 2018 – Spring 2019

## RESEARCH EXPERIENCE

**University of North Carolina School of Medicine** — Chapel Hill, NC
***Lab Manager and Study Coordinator*** — June 2023 – Present
Shen Lab for Developmental & Clinical Neuroscience
Principal Investigator: Dr. Mark Shen

- Analyzing data and writing manuscripts.
  - Wrote a first-author manuscript (currently under review) reporting increased extra-axial cerebrospinal fluid (EA-CSF) in children with Angelman syndrome (AS), with EA-CSF volume linked to seizure severity and sleep disturbances.
  - Preparing two first-author manuscripts: one describing the high prevalence of Chiari I malformation and Cavum Septum Pellucidum in children with AS compared to neurotypical (NT) children, and another reviewing clinical trials involving neurodevelopmental disorders and cerebrospinal fluid.
  - Co-authoring two manuscripts: assisting with data analysis for a comparison of Angelman syndrome, Fragile X syndrome, autism, and NT children using the Aberrant Behavior Checklist-Community (ABC-C) and Social Responsiveness Scale, Second Edition (SRS-2); and contributing to a study describing converging evidence from human infants and rodent models showing cerebrospinal fluid dysregulation.
- Coordinating federally funded research studies
  - Spearheaded the drafting of an IRB application and master study protocol for the first ARPA-H grant (Advanced Research Projects Agency for Health) at UNC, investigating the effects of FDA-approved anti-CGRP medications on cerebrospinal fluid flow and drainage.
  - Coordinated with multiple physicians and researchers across UNC Health for meetings, reporting study progress, and scheduling clinic and assessment appointments for participating families.
  - Prepared study progress reports for funders including NIH and Angelman Syndrome Foundation.
- Running the longitudinal study on infants with Angelman and Fragile X syndromes (NIH grant # P50HD103573 8769).
  - Coordinated the first longitudinal deep brain and behavior phenotyping IDDRC (Intellectual and Developmental Disabilities Research Center) project in infants with Angelman syndrome and Fragile X syndrome, including recruiting, screening, consenting, and enrolling families with infants who have rare developmental genetic disabilities.

    - Achieved enrollment targets by recruiting 16 infants with Angelman syndrome and 10 infants with Fragile X syndrome under 24 months of age.
    - Managed travel logistics for in-person research visits and clinic visits for participating families.
    - Collected and managed sleep data using Emfit, Actiwatch, and daily surveys.
    - Collected and tracked biospecimen data, including saliva samples, from infants and adults.
    - Assisted in acquiring EEG data from infants with rare developmental disabilities (ages 6-24 months), achieving a success rate of up to 95%.
    - Acquired MRI scans from infants with developmental disabilities (ages 6-24 months), achieving a success rate of up to 95%.
    - Wrote 24+ behavioral assessment reports and MRI feedback letters for participating families.
    - Spearheaded quality control of extra-axial cerebrospinal fluid volume segmentation for over 200 infant MRI scans using ITK-SNAP.
- Managing Shen Lab
    - Improved lab cohesion and efficiency by establishing regular biweekly lab meetings and ensuring smooth onboarding for new members.
    - Created structured agendas for each lab meeting to discuss ongoing projects, address challenges, and foster collaboration among team members.
    - Managed and supervised undergraduate research assistants' voluntary work, providing guidance throughout their independent research endeavors.
    - Helped with grant writing, and writing and managing IRB proposals and modifications based on the study grants.

**Harvard University** Cambridge, MA

*Master's Student Research Assistant* Jan 2023 – May 2023

Principal Investigator: Dr. Nadine Gaab (Graduate School of Education)

- Conducted research in Dr. Nadine Gaab's lab for a longitudinal fMRI study examining the neural mechanisms underlying dyslexia and dyscalculia in children, focusing on identifying early markers and understanding cognitive differences to inform educational interventions (NIH Grant # R01HD103358).
- Created over 15 individualized behavioral assessment feedback reports for families to provide insights into developmental progress of reading and math.
- Assisted in fMRI data collection with young children (ages 5-7), including introducing them to the mock scanner and fMRI tasks, serving as a "scanner buddy" in the MRI room, and controlling fMRI tasks from the console room.
- Used FreeSurfer to perform visual quality control on brain masking segmentation for imaging scans over 50 children.

**Harvard University** Cambridge, MA

*Master's Student Research Assistant* Sep 2022 – May 2023

Principal Investigator: Dr. Elizabeth Bonawitz (Computational Cognitive Development Lab)

- Conducted a study with children (ages 6-8) over Zoom to evaluate the effectiveness of thought experiments compared to traditional learning methods for teaching science (Grant: Caplan Foundation for Early Childhood Grant).
- Recruited parents and children for the study through multiple channels, including social media posts and distributing flyers in the local community.
- Obtained consent and assent from participants, scheduled study sessions, managed follow-up communication, and coordinated participant payments upon study completion.

**University of Virginia** Charlottesville, VA

*Undergraduate Research Assistant* Jan 2021 – May 2022

Principal Investigator: Dr. Tobias Grossmann (Dept. of Psychology, Baby Brain Lab)

- Used Python to program tasks including emotion detection, face detection, object detection, trustworthiness detection, Theory of Mind assessments, and behavioral economic games (ultimatum and dictator games) involving hundreds of stimuli.
- Conducted literature reviews to identify and explore research gaps related to emotional and cognitive development during early childhood.
- Helped with IRB modification.

- Trained two new research assistants on lab protocols and study procedures, ensuring smooth integration into the team.
- Led the cooperation study with over 50 undergraduate participants, overseeing all aspects of data collection.
- Managed participant recruitment, scheduling, and payment processing for studies involving over 200 undergraduate participants.
- Recruited children (ages 4-10) at local children's museums for developmental studies at UVA, obtained parental consent and child assent, and conducted studies at the museums.

**University of Virginia** Charlottesville, VA

*University of Virginia* Jan 2021 – May 2022

Principal investigator: Dr. Shige Oishi (Dept. of Psychology, Social Wellbeing Lab)

- Presented a poster on a positive association between perceived complexity and mystery movie ratings, using natural language processing on 14,775 IMDb reviews to show
- Reported that "Aha!" moments in undergraduate coursework were linked to increased psychological richness, based on student course evaluations.
- Collected experimental data from over 20 participants by acting as a confederate in experiments examining the relationship between help received and generosity in prize-sharing.
- Searched and compiled research materials on topics such as "embracing uncertainty," "absolutism," and "diversity in interests" during the COVID-19 pandemic.
- Assisted my research mentor in conducting a literature review on textual analysis for a paper focusing on "psychological richness" and "difficulty."

## PUBLICATIONS AND PRESENTATIONS

**Manuscripts under review:**

1. **Chen Z*,** Garic D*, Xu Y, Smith RG, Weisenfeld LA, Kim SH, Styner MA, Piven J, Philpot BD, Hazlett HC, Shen MD. *Increased Extra-Axial Cerebrospinal Fluid Volume in Angelman Syndrome: Links to Sleep Problems and Seizures.* (Under Review)

**Manuscripts in preparation (4 total: 2 as first-author, 1 as second-author):**

1. **Chen Z*,** Koenig JD, Dave SN, McKinstry RC, Garic D, Shen MD. *High Prevalence of Chiari I Malformations and Cavum Septum Pellucidum in Children with Angelman Syndrome.* (In preparation for submission in Jan 2025).
2. **Chen Z*,** Shirolkar PS, Shen MD. *Cerebrospinal Fluid Abnormalities in Clinical Trials of Neurodevelopmental Disorders.* (In preparation for submission in Feb 2025).
3. Hecht C, **Chen Z**, Piven J, Hazlett HC, Hodgins G, Shen MD. *Comparison of Aberrant Behavior Checklist - Community and Social Responsiveness Scale, Second Edition scores in Angelman Syndrome, Fragile X Syndrome, and neurotypical peers*. (In preparation for submission in Feb 2025)
4. Shen M, Gu B, Golden CEM, Garic D, Rumple AM, Prieto J, Judson MC, Pan P, Miller N, Kim SH, Swanson MR, Brenner H, **Chen Z**, Elison JT, Wolff JJ, McKinstry RC, Dager SR, Schultz RT, Botteron KN, Styner MA, Iliff J, Buxbaum JD, Hazlett HC, Philpot BD, Piven J, Infant Brain Imaging Study (IBIS) Network. *Dysregulation of Cerebrospinal Fluid in Fragile X Syndrome: Convergent Evidence from Human Infants and Rodent Models.* (In preparation for submission in December 2024)

**Conference Presentations (5 total: 2 as presenting author):**

1. **Chen Z *(presenting author),** Garic D, Xu Y, Smith RG, Weisenfeld LA, Kim SH, Styner MA, Piven J, Philpot BD, Hazlett HC, Shen MD. *Extra-Axial CSF Volumes in Angelman Syndrome: Extending beyond Autism to a Neurogenetic Syndrome.* International Society for Autism Research (INSAR) Annual Meeting, Seattle, WA, USA, May 2025.
2. **Chen Z *(presenting author),** Cha Y, Iyer S, Zhu A, Jeong Y, Oishi S*. *Psychological Richness and Difficulty: Degrees of difficulty of movies and coursework predict psychological richness.* Happiness and Well-Being Preconference at the Society for Personality and Social Psychology (SPSP), Virtual, February 2022.

3. Tran P, Worthley E, Botteron KN, Caravella KE, Chen Z, Dager SR, Elison JT, Estes AM, Hazlett HC, Schulz RT, Zwaigenbaum L, Shen MD, Marrus NN, Piven J, Pruett JR Jr, Wolff JJ, IBIS Network. *Emergence of Restricted and Repetitive Behavior in Infants: An Analysis Across Neurodevelopmental Disorders Groups and Time.* Gatlinburg Conference, San Diego, CA, USA, April 2025.
4. Rutsohn J, **Chen Z,** Gross J, McKinstry RC, Borzage M, Zong X, Elison JT, Estes AM, Dager SR, Pandey J, Schultz RT, Botteron KN, Hazlett HC, Styner MA, Marrus N, Pruett JR, Piven J, Garic D, Shen MD. *Quantifying Flow Dynamics of Cerebrospinal Fluid in Infants with Neurodevelopmental Disabilities Using Fréchet Regression.* Institute for Mathematical and Statistical Innovation, Chicago, IL, August 2024.
5. Fulton M, Garic D, **Chen Z**, Gross J, Xu Y, Hecht C, Janis A, West M, Capal J, Shen M, Schwichtenberg A. *Angelman and Fragile X Syndromes: Early Sleep Patterns*. Journal of Purdue Undergraduate Research, April 2024.

## HONORS & AWARDS

Phi Beta Kappa (Spring 2022, University of Virginia)

Dean's List (Spring 2022, University of Virginia)

Dean's List (Fall 2021, University of Virginia)

Dean's List: First Honor (Spring 2019, Boston College)

Dean's List: Second Honor (Fall 2018, Boston College)

## LEADERSHIP & VOLUNTEER EXPERIENCE

**Search Committee** Mar 2024 – June 2024

*University of North Carolina-Chapel Hill, School of Medicine* Chapel Hill, NC

- Coordinated with CIDD (Carolina Institute for Developmental Disability) Human Resources to post a job for a full-time research assistant for the infant brain imaging study on Down syndrome.
- Reviewed 50+ resumes and led interviews to select qualified candidates.

**The 14th Harvard China Education Symposium, Assistant of Operations** Jan 2023 – May 2023

*Harvard Graduate School of Education* Cambridge, MA

- Helped review 200 resumes and hiring volunteers and providing volunteers training.
- Maintained CES social media accounts, WeChat, and email to communicate with volunteers and sponsors.
- Assisted in coordinating in-person Symposium opening activities and managing online events.

**Chinese Student and Scholar Association Mentor** Sept 2018 – May 2019

*Boston College* Chestnut Hill, MA

- Created PowerPoints for Chinese international student orientations and organized social events to help international Chinese students network and build community during Chinese holidays.

**Gateway Mentee** Sept 2018 – May 2019

*Boston College* Chestnut Hill, MA

- Participated in science courses designed for first-generation STEM and pre-med students aiming to pursue a career in STEM.
- Organized networking events for 30+ students and 5 professors during Chinese New Year to foster relationships within the program.

## SKILLS

**Data Analysis & Programming**

- Strong skills in **R** and **Python** for statistical analysis, data visualization, and modeling, including experience with machine learning techniques (natural language processing, classification, clustering).
- Experienced in **Java** and **SPSS**.

**Research Methodology**

- Experienced in writing **master study protocols** (e.g., NIH ARPA-H Grant #ICHUB-24-101-1409; PIs: Mark Shen & Kathleen Caron).
- Skilled in using **Qualtrics** and **REDCap** for survey development and data management.
- Managed multi-site longitudinal studies using the **LORIS** database management system.

**Neuroimaging & Data Collection**

- Experienced in neuroimaging software, including **FreeSurfer** and **ITK-SNAP**, for processing and analyzing MRI data.
- Extensive experience in collecting and preprocessing **EEG** and **MRI** data from infants with developmental disorders.

**Academic Writing & Communication**

- Proficient in manuscript preparation using **LaTeX**.
- Fluent in **English** and native **Mandarin** speaker.