MIAOFAN CHEN

Department of Human Development and Quantitative Methodology
University of Maryland, College Park
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EDUCATION

Present	Ph.D. in Human Development, University of Maryland, College Park Specialization in Developmental Psychology Advisor: Dr. Richard W. Prather
2023	B.A. in Psychology and Cognitive Science (Double Major), Rutgers University, New Brunswick Advisor: Dr. Jenny Wang

AWARDS

2025	Dean's Fellowship, $5000
2024	Dean's Fellowship, $10000
2024	Graduate Student Research Funding, $800
2024	International Conference Student Support Award (ICSSA), $170
2023	Dean's Fellowship, $5000
2023	QMMS Fellowship, $3768
2023	Departmental Fellowship, $800
2023	Magna Cum Laude
2023	Phi Beta Kappa
2023	Paul Robeson Thesis Scholar Award
2023	Psychology, Honors
2023	Cognitive Science, High honors
2022	Internship Stipend (part of a psychology research innovation from the Barbara Ditmars Fund), $3600
2021	The Science for Undergraduate (Project SUPER) Fellowship
2020-2023	Dean's List

PEER-REVIEWED PUBLICATIONS

Submitted

Cracknell, K., **Chen, M.**, Sierp, R., Hauss, J. Bian, L. & Wang, J. (2025). *Children's numerical estimation is biased by male informants more than female informants*.

In Preparation

Chen, M & Prather, R. W. (2025). Benchmarking Number Lines: Immediate Effects of Symbolic and Non-Symbolic benchmark cues in 3- to 5-Year-Olds

Prather, R. W. & **Chen, M.** (2025). *Ordinal Measures of Number Line Estimation Reveal Skill Patterns Across Task Variations.*

CONFERENCE PRESENTATIONS

Chen, M. & Prather, R.W. (2024). *EEG measurement of specific number representation in the human brain* [Poster Presentation]. Mathematical Cognition and Learning Society 2024, Washington, D.C.

Cracknell K., **Chen, M**., Hauss, J. & Wang, J. (2024). *Children's numerical estimations are biased by males more than females* [Lightening talk]. Mathematical Cognition and Learning Society 2024, Washington, D.C.

Chen, M., Bass, I. & Wang, J. (2023). *Building A Computational Model for Predicting 2-to 4-year-old Children's Cardinal Principal Knower Level Online* [Poster Presentation]. National Honor Society in Neuroscience, New Brunswick, NJ.

Chen, M., Aminu, J., Mbarki., R. & Wang, J. (2021). *Investigating 3- to 9-month-old infants' processing of abstract numerical information* [Poster Presentation]. Biennial Cognitive Development Society Conference 2021, Madison, WI.

Chen, M. & Wang, J. (2021). *Pre-counting infants' understanding of number words* [Poster Presentation]. The SUPER STEM Summer Scholar, New Brunswick, NJ.

Chen, M. & Wang, J. (2020). *See numbers, hear numbers* [Poster Presentation]. Rutgers Introduction to Scientific Research course, New Brunswick, NJ.

INVITED TALKS

Chen, M. & Prather, R.W. (2024). *EEG measurement of specific number representation in the human brain.* 1st EdUHK International Conference for Research in Early Childhood Education and Development, Hong Kong.

RESEARCH EXPERIENCE

2023-present

Graduate Research Assistant, Cognition and Development Lab

University of Maryland, College Park, PI: Dr. Richard Prather

Project 1. EEG Measurement of Specific Number Representation in the Human Brain

- Duties: Reviewing literatures, designing research studies and procedures using python and PsychoPy, IRB approval, manuscript writing, learning neuroimaging measurement like EEG, running participants on behavioral and EEG tasks, conference presentations, data collection, weekly meetings

Project 2. Impact of Symbolic and Non-Symbolic Benchmarks on Number Line Estimation in Children Aged 3 to 5

- Duties: Reviewing literatures, designing research studies and procedures using PsychoPy, training and mentoring research assistants, IRB approval, recruiting, running child participants on different preschools and in museum, manuscript writing, data entry, data analysis (using R), poster presentation, weekly meetings

Project 3. Systematic review

- Duties: Reviewing literatures, meeting with librarian and mentor

2021-2023

Research Assistant, Cognition and Learning Center

Rutgers University, New Brunswick, PI: Dr. Jenny Wang

Project 1. "See Numbers Hear Numbers", project leader

- This project aimed to dig into whether and how babies at different ages - i.e., 3- to 9-month-old - react to cross model – i.e., images and sounds - of different **quantities** and how they abstract number information from the busy and complex world.
- Supported infants' mapping of abstract numerical information across sensory modalities and found little evidence of developmental changes in this ability across 3 to 9 months of age.
- Reviewed literatures, designd and running eye-tracking experiments using Audacity and Lookit, data coding using Datavyu, trained and mentored research assistants, manuscript writing, presented the findings in a poster as the first author at the CDS conference in Madison in 2022., attended lab meetings and bi-weekly meetings.

Project 2. "Look-to-x", project leader, collaborate with Dr. Alex Silver

- This project aimed to see whether 1- to 2-year-old toddlers can match **how many things they see** on the screen to the **number words** they hear and whether different grammar features such as singular or plural words can help this process.
- Further investigated the Approximate Number System (ANS) development of pre-counting toddlers and discovered that babies would prefer to look at the image with more items when they do not know which image pairs with the number words they hear and the animal phrases with morphological cues for pluralism and singularity influenced babies' decision-making during the matching process.
- Designed the study protocol, programmed the study on Lookit, and presented the findings as the first author at the Project SUPER online Research Symposium in the summer of 2021.

Project 3. Hysteresis SFON Project, team leader, collaborate with Dr. Alex Silver and Dr. Melissa Libertus

- This project aimed to explore the factors that influence 3- to 5-year-old children's **curiosity**, especially the factors would make children more or less interested in math-related information.
- Discovered higher spontaneous focusing on number (SFON) tendency predicts better math performance in young children based on the tendency of spontaneous focusing on number (SFON) tendency generated by Approximate Number System (ANS) hysteresis.
- Generated the study stimuli and programmed the study on Lookit, attended lab meetings.

Project 4. Gender Project, project leader, collaborate with Dr. Lin Bian

- This project aimed to understand social impacts on 5- to 7-years-old children's performance on simple cognitive tasks, including **number estimation** and working memory ability for letters.
- Designed the study to evaluate the differences between prior and later performance in participants' choosing preferences in trials with and without two friends of different genders, implemented the study on Lookit, and began analyzing the data and the writing process.
- Generated the experiment script, reviewed literatures, designed and running experiments using Audacity and Lookit, data coding using Excel sheet, made the certification for participants, trained and mentored research assistants, manuscript writing, collected peer review on Slack, conference presentations, collaborated with Dr. Alex Silver, attended lab meetings and bi- weekly meetings

Project 5. "Baby Count Online 1.0 &2.0", team member

- This project aimed to probe whether **virtual counting** can benifit 14- to 19-month-old children recognize quantities of objects and improve their working memory of numbers.
- Discovered virtual counting facilitates infants' working memory for hidden objects on screen via coded 72 videos collected on Lookit through Datavyu.

Project 6. "Kelly Choose", team member

- This project aimed to understand how 11-month-old to 1-year-old babies expect other people to make choices.
- Data coding using Datavyu and discovered a pattern in which babies expressed surprise when agent selected the box with mismatched number of items via coded 47 videos collected on Lookit through Datavyu.

Project 7. "Theory of Mind in 3- to 5-years-old", volunteer

- This project aimed to explore whether 3- to 5-years-old children can infer other people's thoughts.
- Recruited child participants in museum, ran child participants in museum, and attended weekly meetings.

- Collaborated with lab members and provided feedback on Slack for other lab researchers' projects.
- Recruited and tested project participants (6 months to 8 years old) online and clarified the experimentation with participants' parents.

2022

Research Assistant Intern, Computational Cognitive Development Lab
Harvard University, PI: Dr. Elizabeth Bonawitz & Dr. Ilona Bass
Project 1. Rote/Reflect Pedagogy project, intern

- This project aimed at discovering the reactions of 3- to 11-year-olds and adults online based on three different types of teaching styles – i.e., Rote, Between, Reflect - teachers to explain how learners make inferences from others.
- Implanted EEG in the testing process to better access children's reactions in different teaching styles based on brain reactions and visualized the stimulus on Tablet via JavaScript – i.e., CSS, JS, HTML.
- Designed the study flow, made the stimuli through PS and drawing tools, coded the study through JavaScript and MatLab, filmed videos, connected the program with EEG devices, attended weekly meetings.

Project 2. Honor Thesis Proposal

- Developing an independent research project to build a computational model for predicting 2-to 4-year-old children's cardinal principal knower level.
- Optimized the online approach to access children's CP (Cardinal Principal) knower level and established a reliable model on Jupyter Notebook using Joint multiple regression, Bootstrapping, K-Nearest-Neighbor, Support Vector Machine, and Logistic regression to access children's number knower level online based on Point-to-X task.

2022-2023

Research Assistant, Language Acquisition and Processing Lab
Rutgers University, New Brunswick, PI: Dr. Karin Stromswold
Project: The Syntax Difference Between Mandarin and English in Interrogative Sentences
Duties: Reviewed literature, attended lab meetings and weekly meetings.

2021

Research Assistant, Culture and Child Development Lab
East China Normal University, PI: Dr. Xin Zhao
Projects: Progress Understanding in Preschooler
Duties: Reviewed literatures, data collection in local kindergarten, and data coding.

PROFESSIONAL Development

2024	EdUHK ECE International Summer School and Symposium for Doctoral students (InSoDoc)
2021&2022	NYU summer research training programming
2021	Project SUPER workshop #1 and #2
2021	Yale summer research training programming
2020	Rutgers Introduction to Scientific Research course

PROFESSIONAL MEMBERSHIPS

Cognitive Development Society
Math Learning and Cognition Society

PROFESSIONAL EXPERIENCE AND SERVICE

Department and University Service

Human Development Program Recruitment Planning Committee
Student Members, 2025

Guest Lectures

EDHD 201 Learning How to Learn (Instructor: Dr. Lauren Trakhman), Summer 2025
EDHD 420 Cognitive Development and Learning, (Instructor: Dr. Richard Prather), Spring 2025

GRADUATE COURSES TAKEN

EDHD 629 Developmental Science Seminar and Colloquium
EDMS 646 General Linear Models I
EDMS 651 General Linear Models II
EDMS 655 Introduction to Multilevel Modelling
EDMS 647 Causal Inference and Evaluation Methods
EDHD 690 Theoretical Foundations of Human Development
EDHD 718 Apprenticeship in College Teaching
EDHD 720 Social Development
EDHD 721 Cognitive Development
EDHD 722 Learning Theory and the Educative Process
EDHD 775 Human Development and Neuroscience
EDHD 780 Research Methods in Human Development
EDHD 835 The Development of Achievement Motivation
EDHD 888 Apprenticeship in Human Development Research

UNDERGRADUATE MENTORSHIP

University of Maryland
Evelyn Li

ADDITIONAL INFORMATION

Technical:

- Statistical Software: R (expert)
- Statistical Skills: General linear models (regression, ANOVA, ANCOVA), multilevel modeling (mixed-effects models), causal inference methods (e.g., PSM, RDD), mediation & moderation analysis, data visualization (ggplot2), multiple imputation
- Programming: MATLAB (familiar), Python (experienced), Java (experienced), JavaScript (experienced)
- Experimental Tools: PsychoPy (expert), Datavyu (expert), Audacity (familiar)

Certifications: CITI, IRB, and IACUC.
Languages: Chinese, Mandarin, Cantonese, English
Hobbies: Table Tennis, Piano, Ukulele, Kalimba, & Reading