

Yannan Hu

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University of Illinois, Urbana-Champaign
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Professional Positions

Postdoctoral Research Associate

July 2023–Present

PIs: Drs. Nancy McElwain & Mark Hasegawa-Johnson
Beckman Institute for Advanced Science and Technology
University of Illinois at Urbana-Champaign, Champaign, IL

Education

Ph. D. in Human Development and Family Studies

2023

University of Illinois at Urbana-Champaign, Champaign, IL
Dissertation: *Real-time Mother–Infant Bio-behavioral Synchrony and Infant Socioemotional Functioning over the First Year*
Committee: Drs. Nancy L. McElwain (Chair), Kelly F. Bost, Kelly M. Tu, & Daniel Berry

M. S. in Human Development and Family Studies

2020

University of Illinois at Urbana-Champaign, Champaign, IL
Thesis: *Real-time Mother-Child Physiological Coordination: The Moderating Effect of a Mutually Responsive Orientation*
Committee: Drs. Nancy McElwain (Chair) & Kelly M. Tu

B. S. in Psychology

2018

Beijing Normal University, Beijing, China
Thesis: *The Links Between Children's Physiological and Behavioral Emotion Regulation and Dyadic Conflict Resolution with Parents*
Advisor: Dr. Zhuo Rachel Han

Research Interests

- Early social-emotional development in family context
- Psychobiological dynamics in real-time parent-child interactions
- Parent-child relationship and emotion-related parenting practices

Publications

Peer-Reviewed Journal Articles

- Hu, Y., Chen, H., Li, X., Larsen, R. J., Sutton, B. P., Gao, W., & McElwain, N. L. (2023). Associations between infant amygdala functional connectivity and social engagement following a stressor: A preliminary investigation. *Developmental Science*, e13418. <https://doi.org/10.1111/desc.13418>
- Li, X., Chen, H., Hu, Y., Larsen, R. J., Sutton, B. P., McElwain, N. L., & Gao, W. (2023). Functional neural network connectivity at 3 months predicts infant-mother dyadic flexibility during play at 6 months. *Cerebral Cortex*, bhad117. <https://doi.org/10.1093/cercor/bhad117>

- McElwain, N. L., **Hu, Y.**, Li, X., Fisher, M., Baldwin, J. C., & Bodway, J. M. (2022). Zoom, zoom, baby! Assessing mother-infant interaction during the still face paradigm and infant language development via a virtual visit procedure. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.734492>
- Hu, Y.**, McElwain, N. L., & Berry, D. (2021). Mother-child mutually responsive orientation and real-time physiological coordination. *Developmental Psychobiology*, 63(7), e22200. <http://dx.doi.org/10.1002/dev.22200>
- Hu, Y.**, Emery, H. T., Ravindran, N., & McElwain, N. L. (2020). Direct and indirect pathways from maternal and paternal empathy to young children's socioemotional functioning. *Journal of Family Psychology*, 34(7), 825-835. <https://doi.org/10.1037/fam0000745>
- Ravindran, N., **Hu, Y.**, McElwain, N. L., & Telzer, E. H. (2020). Dynamics of mother-adolescent and father-adolescent autonomy and control during a conflict discussion task. *Journal of Family Psychology*, 34(3), 312-321. <https://doi.org/10.1037/fam0000588>
- Hu, X., Han, Z. R., Wang, H., **Hu, Y.**, Wang, Q., Feng, S., & Yi, L. (2018). The relation of parental emotion regulation to child autism spectrum disorder core symptoms: The moderating role of child cardiac vagal activity. *Frontiers in Psychology*, 9, 2480. <https://doi.org/10.3389/fpsyg.2018.02480>
- Wang, H., Mai, X., Han, Z. R., **Hu, Y.**, & Lei, X. (2018). Linkage between parent-child frontal resting electroencephalogram (EEG) asymmetry: The moderating role of emotional parenting. *Journal of Child and Family Studies*, 27(9), 2990-2998. <https://doi.org/10.1007/s10826-018-1121-5>

Manuscripts in Preparation

- Hu, Y.**, Davila, M., Li, X., & McElwain, N. L. Mother-infant microtemporal processes during play contribute to infant behavioral and vagal stress recovery.
- Li, X., **Hu, Y.**, Davila, M. I., & McElwain, N. L. Transactional links between mother-infant dyadic flexibility and infant vagal response to the still face paradigm across the first year.
- Islam, B., McElwain, N. L., Li, J., Davila, M., **Hu, Y.**, Hu, K., Bodway, J., Dhekne, A. M., Roy Choudhury, R., & Hasegawa-Johnson, M. Validation of LittleBeats™: A multimodal sensing platform to capture cardiac physiology, motion, and vocalizations in naturalistic contexts.
- McElwain, N. L., Li, X., **Hu, Y.**, & Fisher, M. Infant night time sleep consolidation and regulation: Relations with expressive and receptive language across the first year of life.

Conference Presentations

- Hu, Y.**, & McElwain, N. L. (2023, March 23–25). Mother-Infant RSA Synchrony and Infant Stress Recovery Over the First Year [Poster presentation]. Society for Research in Child Development (SRCD) 2023 Biennial Meeting, Salt Lake City, Utah, United States.
- Li, X., Chen, H., **Hu, Y.**, Larsen, R. J., Sutton, B. P., McElwain, N. L., & Gao, W. (2023, March 23–25). Functional neural network connectivity at 3 months predicts infant-mother dyadic flexibility at 6 months [Flash talk]. Society for Research in Child Development (SRCD) 2023 Biennial Meeting, Salt Lake City, Utah, United States.
- Hu, Y.**, Davila, M. I., Li, X., & McElwain, N. L. (2022, Nov 9–11). Real-time mother-infant behavioral and physiological synchrony over the first year [Poster presentation]. International Society for Developmental Psychobiology (ISDP) 2022 Hybrid Annual Meeting, San Diego, CA, United States.
- Hu, Y.**, Chen, H., Li, X., Larsen, R., Sutton, B., Gao, W., & McElwain, N. L. (2022, July 7–10). Associations between infant amygdala functional connectivity and infant affective engagement following a stressor [Poster presentation]. 23rd International Congress of Infant Studies (ICIS), Ottawa, Canada.

- Hu, Y.,** Davila, M. I., Li, X., & McElwain, N. L. (2022, July 7–10). Real-time associations between maternal affective engagement and infant behavioral and physiological responses to a stressor. In E. B. daSilva (Chair), *Multi-level dyadic pathways influence infants' emotion regulation across prenatal and postnatal development* [Symposium]. 23rd International Congress of Infant Studies (ICIS), Ottawa, Canada.
- Hu, Y.,** Davila, M., Li, X., & McElwain, N. L. (2021, November 10–12). Mother-infant microtemporal processes during play contribute to infant vagal regulation following a stressor [Poster presentation]. International Society for Developmental Psychobiology (ISDP) 2021 Hybrid Annual Meeting, Chicago, IL, United States.
- Li, X., **Hu, Y.,** Davila, M., & McElwain., N. L. (2021, November 10–12). Mother-infant dyadic flexibility and infant vagal response to the still face paradigm [Poster presentation]. International Society for Developmental Psychobiology (ISDP) 2021 Hybrid Annual Meeting, Chicago, IL, United States.
- Hu, Y.,** McElwain, N. L., Li, X. (2021, April 7–9). Mother-infant microtemporal processes during play contribute to infant affective engagement following a stressor [Poster presentation]. Society for Research in Child Development (SRCD) 2021 Virtual Biennial Meeting.
- Hu, Y.,** McElwain, N. L., Berry, D. (2020, October 21–23). Real-time mother-child physiological coordination: The moderating effects of mutually responsive orientation in two play contexts [Poster presentation]. International Society for Developmental Psychobiology (ISDP) 2020 Virtual Annual Meeting.
- Hu, Y.,** & Han, Z. R. (2019, March 21–23). The links between children's physiological and behavioral emotion regulation and dyadic conflict resolution with parents [Poster presentation]. Society for Research in Child Development (SRCD) 2019 Biennial Meeting, Baltimore, MD, United States.

Doctoral Research Experience

Research Assistant, Interdisciplinary Lab for Social Development (ILSD)

2018–2023

PI: Dr. Nancy L. McElwain

Infant Development Project

This project aims to understand how infants' earliest interactions with their parents help support behavioral and brain development within the first year of life.

- Develop and supervise observational coding for infant behaviors
- Supervise and participate in physiological data (ECG) processing and editing
- Prepare and manage submissions to NIMH Data Archive
- Manage data, including questionnaire, observational, fMRI, and LENA data
- Analyze data (MLM and SEM in R and Mplus) and prepare manuscript
- Assist with grant application

LittleBeats Project

This project aims to validate a wearable mobile sensing device for young children, LittleBeats, which is designed to simultaneously capture motion, physiological, and audio data.

- Develop and supervise observational coding for infant motion behaviors
- Assist with development of machine learning algorithm for parent-child vocal coordination patterns
- Co-supervise speech annotation
- Edit physiological data
- Prepare manuscript

Honors and Awards

- The Beckman Institute Postdoctoral Fellowship, University of Illinois **2023**
- Graduate College Dissertation Completion Fellowship, University of Illinois **2022**
- Graduate Student Travel Award, International Congress of Infant Studies **2022**
- Student Travel Award, International Society for Developmental Psychobiology **2020, 2021**
- Graduate Fellowship, University of Illinois **2018**
- Human Development and Family Studies Departmental Fellowship, University of Illinois **2018**
- Jingshi Scholarship, Beijing Normal University **2015, 2016, 2017**

Methodological Training

Workshops

- Machine Learning and BIG DATA Workshop **Aug 2023**
- Modern Missing Data Analysis by Dr. Craig Enders, CenterStat **June 2022**
- Analyzing Intensive Longitudinal Data by Drs. Jean-Philippe Laurenceau & Niall Bolger, CenterStat **June 2021**
- Multilevel Modeling by Drs. Daniel Bauer & Patrick Curran, CenterStat **June 2020**
- Longitudinal Structural Equation Modeling by Drs. Daniel Bauer & Patrick Curran **May 2020**

Selected Graduate-Level Method Courses

- PSYC 542: Interdisciplinary Approaches to Neuroscience by coordinated Dr. Michelle Tomaszycski **Fall 2021**
- EPSY 590: Structural Equation Modeling by Dr. Ge Jiang **Spring 2020**
- EPSY 590: Messy Data in Structural Equation Modeling by Dr. Yan Xia **Fall 2019**
- HDFS 597: Advanced Statistical Analysis by Dr. Brian Ogolsky **Fall 2019**

Professional Skills

Statistical

- **Software:** R; SPSS; Mplus; HLM; Blimp
- **Analysis:** Data visualization; mediation and moderation; multilevel modeling; longitudinal structural equation modeling; missing data analysis

Equipment and Software

- **Physiological data collection:** Polygraph (BioPac MP150); Electroencephalograph (EEG); Near-infrared spectroscopy (NIRS; TechEn CW)
- **Physiological data processing and analysis:** BIOPAC Acqknowledge; Mindware HRV Software; CardioPeak and Segmenter; CardioEdit; CardioBatchPlus
- **Behavioral coding:** Datavyu; ELAN; Praat
- **Data Management:** Python; Excel Visual Basic for Applications

Languages

- Fluent in Mandarin and English

Teaching and Mentoring Experience

Teaching Assistant, University of Illinois

- PSYC 318: Psychology of the Infant **Spring 2023**
 - Lead review session
 - Grade writing assignments and exams

Co-Instructor, University of Illinois

- HDFS 594: Intermed Statistical Analysis, ***Ranked as Excellent*** **Spring 2022**
This graduate-level course covered topics including mediation, moderation, and logistic regression using SPSS and R.

Teaching Assistant, University of Illinois

- HDFS 290: Introduction to Research Methods, ***Ranked as Excellent*** **Fall 2020–Fall 2021**
 - Led weekly lab sections (16 students per section)
 - Online for two semesters, in person for one semester

Guest Speaker, University of Illinois

- PSYC 598: Developmental Brownbag **Fall 2022**
- HDFS 500: Professional Development **Fall 2022**

Statistical Consultant, University of Illinois

Fall 2021–Spring 2022

- Alexandra Lundquist, dissertation title: *Understanding complementary feeding practices in early care and education settings.*

Co-Advisor on undergraduate research project

Spring 2019

- Olamide Oyeyemi, James Scholar Honors project title: *Maternal vagal tone and child inhibitory control: Interactive contributions to child attention during a challenging puzzle task.*

Professional and Community Service

- *Ad Hoc* Reviewer
 - *Developmental Science*
- *Ad Hoc* Co-reviewer with Dr. Nancy L. McElwain
 - *Social Development*
 - *Infancy*
 - Society for Research in Child Development 2023 Biennial Meeting
- Membership and Affiliations
 - Society for Research in Child Development
 - International Society for Developmental Psychobiology
 - International Congress of Infant Studies
- Departmental Service in HDFS at University of Illinois
 - Search Committee Member, Teaching Assistant Professor
 - Inclusion and Diversity Committee
 - Graduate Student Organization member

Media Coverage

- ACES News: [When mom and child interact, physiology and behavior coordinate](#)
- Psychology Today: [Playing Together Synchronizes Mother-Child Autonomic Systems](#)