

SHIRLEY DUONG

Website and portfolio: s-duong.github.io

Emails: shirleyduong5@gmail.com, shd77@pitt.edu

Last updated: February 2023

EDUCATION

University of Pittsburgh

Ph.D. Expected 2023/2024

Cognitive Psychology, M.S. (Advisor: Dr. Melissa Libertus)

April 2021

Certificate, Center for the Neural Basis of Cognition

National Science Foundation Graduate Research Fellowship (\$138,000 scholarship over 5 years)

- Dissertation Project: "Exploring multi-dimensional profiles of families' home math environments and the relations to children's math skills"

University of New Haven

May 2017

Psychology, B.A. (Honors Thesis Advisor: Dr. Patrick McGrady)

Mathematics Minor

RESEARCH INTERESTS

- Links between children's early math experiences in the home learning environment (HLE) and their emerging math skills
- Innovative methods (coding schemes and statistical modeling) for measuring the HLE
- Applications of HLE research to address opportunity gaps in early childhood education and professional development programs, initiatives, and policies

TECHNICAL SKILLS

- Languages and software: R, Stata, SQL, Python, HTML
- Data analysis: linear and logistic regression, multi-level modeling, cluster analysis, categorical time series analysis, thematic analysis
- Visualization and reports: ggplot2, R Markdown, Jupyter Notebook, Looker Studio, Tableau, ArcGIS, Seaborn
- Assessment development and text coding: Qualtrics, Datavyu, Nvivo, PsychoPy

SELECT HONORS & AWARDS

- National Science Foundation Graduate Research Fellowship (2019-Present)
- Society for Research in Child Development Graduate Student Travel Award (2023)
- University of Pittsburgh, Learning Research & Development Center, Graduate Student Award (2021)
- Society for Philosophy and Psychology Graduate Student Travel Award (2018)
- University of New Haven, Arts & Sciences Undergraduate Research Award (2017)
- University of New Haven, John D. Hatfield Scholar, Honors Program (2015-2017)

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RESEARCH & QUANTITATIVE EXPERIENCE

Data Analyst

Sept. 2022-Present

Trying Together

Pittsburgh, PA

- Design community and organizational surveys on the early childcare workforce and climate, early childhood initiatives and programs (e.g., [Buzzword](#), [Playful Pittsburgh Collaborative](#)), and professional development to inform operational, collaborator, and stakeholder needs
- Execute cleaning, merging, and pre-processing of data from several sources (e.g., surveys, government records, US Census data, geographic data) for qualitative and quantitative analysis
- Translate and present findings via brief research reports and data visualization dashboards to track and support the organization's strategies, goals, and grant applications

Graduate Student Researcher

Jul. 2018-Present

University of Pittsburgh, Kids' Thinking Lab

Pittsburgh, PA

Project: [Parents Promoting Early Learning](#)

(PIs: Drs. Melissa Libertus, Heather Bachman, and Elizabeth Votruba-Drzal)

- Design and adapt math, language, and executive functioning assessments for online and age-appropriate administration; collect data via home visits and video calls
- Develop, implement, and train 20+ research assistants on transcription coding schemes to capture the temporal sequence and qualitative features of conversations
- Execute inferential and qualitative data analysis of text, observational, assessment, interview, and survey data (e.g., modeling the dynamics of caregiver-child interactions)
- Lead workshops, talks, and meetings on current research findings, statistical methods, and programming (e.g., extracting information from databases, how to conduct *k*-means cluster analysis, data visualization with *ggplot2*)
- Mentor 10+ undergraduate and post-bac researchers completing Honors theses and external research presentations

Statistics and Programming Consultant

Dec. 2021-Present

Naissance; Purdue University

- Modify, test, and debug code of a cognitive assessment battery for a multi-site academic intervention
- Execute data cleaning, outlier detection, power analyses, visualization, and descriptive and predictive analyses on financial service email campaigns
- Developed and applied a thematic coding scheme to interview transcripts
- Conducted reliability analyses of behavioral coding schemes for a music intervention study

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Lab Manager

University of Maryland, Lab for Early Social Cognition

Jun. 2017-Jun. 2018

College Park, MD

Research Assistant

Yale University, Social Cognitive Development Lab

Sept. 2015-May 2017

New Haven, CT

Research Assistant

University of New Haven, Departments of Mathematics and Psychology

May 2015-May 2017

West Haven, CT

PUBLICATIONS

*Indicates undergraduate student or post-bac mentee; +Denotes joint authorship

*Carver, C., **Duong, S.**, Bachman, H., Votruba-Drzal, E., & Libertus, M. E. (2022). Examining relations between parental feedback types and preschool-aged children's academic skills. *International Journal of Psychological Studies*, 14(4). <http://dx.doi.org/10.5539/ijps.v14n4p1>

Elliott, L. E., Carvalho Pereira, J. M., Portia, M. L., Coulanges, L., Podvysotska, T., **Duong, S.**, Bachman, H. J., Votruba Drzal, E., & Libertus, M. (2022). Self-regulation in toddlers and the emergence of pre-academic disparities. *Infant Behavior and Development*, 69, 101779. <https://doi.org/10.1016/j.infbeh.2022.101779>

Bachman, H. J., Votruba-Drzal, E., Miller, P. L., Elliott, L. E., **Duong, S.**, & Libertus, M. E. (2022). Associations among socioeconomic status and preschool-aged children's approximate number system acuity, number, and spatial skills: The role of executive function. *Journal of Experimental Psychology*, 221, 105453. <https://doi.org/10.1016/j.jecp.2022.105453>

Duong, S., Bachman, H. J., Votruba-Drzal, E., & Libertus, M. (2021). What's in a question? Parents' question use in dyadic interactions and the relation to preschool-aged children's math abilities. *Journal of Experimental Child Psychology*, 211, 105213. <https://doi.org/10.1016/j.jecp.2021.105213>

Libertus, M. E., **Duong, S.**, Fox, D., Elliott, L. E., McGregor, R., Ribner, A., & Silver, A. (2021) A rational explanation for links between the ANS and math. Commentary to Clark, S., Beck J., (2021) The number sense represents (rational) numbers in *Behavioral and Brain Sciences*, 1-57. <https://10.1017/S0140525X21001011>

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Bachman, H. J., Elliott, L., **Duong, S.**, Betancur, L., Navarro, M. G., Votruba-Drzal, E., & Libertus, M. (2020). Triangulating multi-method assessments of parental support for early math skills. *Frontiers in Education: Educational Psychology*.
<https://doi.org/10.3389/feduc.2020.589514>

Ahl, R.E., **Duong, S.**, & Dunham, Y. (2019). Children employ wealth cues when predicting others' sharing. *Developmental Psychology*, 55(2), 303-314.

Kottegoda, Y., Mastropietro, A., **Duong, S.** (2019). Characteristics of modulo one sequences. *Elemente der Mathematik*, 74, 1-11.

Ramesh, S., **Duong, S.**, Dosani, F., & Dina, B. (2019). A note on Wronskians of real analytic functions. *Far East Journal of Mathematical Education*, 19(2), 113-117.

Libertus, M. E., +**Duong, S.**, & +Silver, A. (2020). Mathematical cognition. In Benson, J. B. (Ed.), *Encyclopedia of infant and early childhood development*, 2nd edition vol. 2, (pp.311-318). Cambridge, MA: Academic Press. doi: 10.1016/B9780-12-809324-5.23573-6

PUBLICATIONS UNDER REVIEW

Duong, S., Bachman, H. J., Votruba-Drzal, E., & Libertus, M. (minor revision). Exploring the role of “in the moment” and global factors in parents’ questioning during shared book reading.

Duong, S., Davis, T., Bachman, H., Votruba-Drzal, E., & Libertus, M. E. It takes two to tango: Exploring the dynamic structures of caregiver-child number talk using recurrence quantification.

Duong, S., Elliott, L. E., *Sodoti, O. C., Bachman, H., Libertus, M. E., & Votruba-Drzal, E. Money talks! The role of parents’ discussion of money for preschoolers’ math knowledge.

PUBLICATIONS IN PREP

*Indicates undergraduate student or post-bac mentee

Silver, A. M., **Duong, S.**, Elliott, L. E., Bachman, H. J., Votruba-Drzal, E., & Libertus, M. E. Methodological considerations in math talk measurement.

Chandler-Campbell, I., *Manley, C. E., **Duong, S.**, *Pickering, A., & Corriveau, K. H. Promoting learning agency outside of the classroom: Effects of autonomy-supportive language on child- engagement in informal STEM learning

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CONFERENCE PRESENTATIONS

*indicates undergraduate student mentee

Duong, S., Davis, T., Votruba-Drzal, E., Bachman, H. J., & Libertus, M. E. (2023, March). It takes two to tango: Dynamic and reciprocal caregiver-child conversations about numbers and math. In I. Chandler-Campbell & **S. Duong** (Chairs), *Tinkerer, Investigator, Learner, Scientist: Promoting children's active role in informal STEM conversations*. [Symposium]. Society for Research in Child Development Biennial Meeting, Salt Lake City, UT.

Chandler-Campbell, I., *Manley, C. E., **Duong, S.**, *Pickering, A., & Corriveau, K. (2023, March). Effects of autonomy-supportive language on child engagement in informal STEM learning. In I. Chandler-Campbell & **S. Duong** (Chairs), *Tinkerer, Investigator, Learner, Scientist: Promoting children's active role in informal STEM conversations*. [Symposium]. Society for Research in Child Development Biennial Meeting, Salt Lake City, UT.

Duong, S., Carvalho Pereira, J. M., *Lopiccolo, D., Votruba-Drzal, E., Bachman, H. J., & Libertus, M. E. (2023, March). "Beneath counts: Exploring the dynamics of caregiver-child conversations about numbers and math in semi-structured activities." [Poster] Society for Research in Child Development Biennial Meeting, Salt Lake City, UT.

Carvalho Pereira, J. M., Elliott, L., **Duong, S.**, Kothari, D., *Lopiccolo, D., Bachman, H. J., Votruba-Drzal, E., & Libertus, M. E. (2023, March). Are Some Math Talk Types More/Less Related to Concurrent Math Skills? Examining Preschoolers' Quantifier Talk. [Poster] Society for Research in Child Development, Salt Lake City, Utah.

Duong, S., Elliott, L. E., Bachman, H., Votruba-Drzal, E., & Libertus, M. (2022, June). "Variation in parents' number talk with their preschool-aged children: A cluster-analytic approach." [Poster] Mathematical Cognition and Learning Society Conference, Antwerp, Belgium.

*Hofman, S., **Duong, S.**, Bachman, H., Votruba-Drzal, E., & Libertus, M. (2022, June). "The Role of Gestural and Spatial Input in Children's Early Spatial Skills." [Poster] Mathematical Cognition and Learning Society Conference, Antwerp, Belgium.

Carvalho Pereira, J. M., **Duong, S.**, Elliott, L. E., Bachman, H., Votruba-Drzal, E., & Libertus, M. (2022, June). "Toddlers' math talk in response to parents' math-related prompts, but not statements, predicts early numeracy." [Poster] Mathematical Cognition and Learning Society Conference, Antwerp, Belgium.

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- Duong, S.**, Elliott, L. E., Bachman, H., Votruba-Drzal, E., & Libertus, M. (2022, April). "Exploring clusters of parents engaging in number talk with their preschool-aged children and the relation to children's math skills." [Poster] Cognitive Development Society Conference, Madison, WI.
- Chandler-Campbell, I., *Manley, C. E., **Duong, S.**, *Pickering, A., & Corriveau, K. H. (April, 2022). "Promoting learning agency outside of the classroom: Effects of autonomy-supportive language on child-engagement in informal STEM learning." [Poster] Cognitive Development Society Conference, Madison, WI.
- Duong, S.**, Fox, D., Gordner, S., Bachman, H., Votruba-Drzal, E., & Libertus, M. (2021, September). "Coding and analyzing the sequential nature of parent-child interactions during semi-structured play." [Poster] International Conference on Interactivity, Language, and Cognition: Integrating Quantitative and Qualitative Methods in the Cognitive and Language Sciences, online.
- Duong, S.**, Bachman, H., Votruba-Drzal, E., & Libertus, M. (2021, March). Parents' sensitivity to child-level factors and the relation to parental questioning during dyadic interactions. In **S. Duong** (Chair), *Novel perspectives on the role of adult questions for children's learning and cognition*. [Symposium]. Society for Research in Child Development Biennial Meeting, online.
- Duong, S.**, Elliott, L., Bachman, H., Votruba-Drzal, E., & Libertus, M. (2021, March). "Minute-by-minute variations in parental number talk and their implications for coding parent-child interactions." [Poster] Society for Research in Child Development Biennial Meeting, online.
- *Kammerzell, J., **Duong, S.**, Heywood, N., Isaacson, M., Libertus, M., Votruba-Drzal, E., & Bachman, H. (2021, March). "Exploring relations between parent and child factors and parental praise in preschool aged-children." [Poster] Society for Research in Child Development Biennial Meeting, online.
- *Sidoti, O. C., **Duong, S.**, Bachman, H., Votruba-Drzal, E., & Libertus, M. (2021, March). "Variations in parental talk about numbers and money during pretend play with 4-year-olds." [Poster] Society for Research in Child Development Biennial Meeting, online.
- Duong, S.**, & Libertus, M. (2020, December). "Uncertainty resolution in numerosity comparison: the moderating role of math ability." [Poster] Society for Judgement and Decision-Making Conference, online.

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- Duong, S.**, Bachman, H., Votruba-Drzal, E., & Libertus, M. (2020, September). "Qualitative differences in parental questioning during dyadic interactions and the relation to 4-year-old children's math abilities." [Poster] Interacting Brains: Adult-Child Interactions From Multiple Perspectives Conference, online.
- Duong, S.**, Bachman, H., Votruba-Drzal, E., & Libertus, M. (2020, June). "'What's after six?': Parental math questions relate to 4-year-old children's math skills." [Poster] Mathematical Cognition and Learning Society Conference. Cancelled due to COVID-19.
- Duong, S.**, *Pitulski, S., Bachman, H., Votruba-Drzal, E., & Libertus, M. (2019, October). "What's in a question? Parents' question use in dyadic interactions and the relation to 4-year-old children's math abilities." [Poster] Cognitive Development Society Conference, Louisville, KY.
- Duong, S.**, & Libertus, M. (2019, June). "Children's math abilities and the relation to risky decision making: a study proposal." [Poster] Mathematical Cognition and Learning Society Conference, Ottawa, CA.
- Duong, S.**, *Pitulski, S., Bachman, H., Votruba-Drzal, E., & Libertus, M. (2019, June). "Measuring the quality of parent child interactions and the relation to preschool-aged children's math skills." [Poster] Mathematical Cognition and Learning Society Conference, Ottawa, CA.
- Duong, S.**, Terrizzi, B.F., Butler, L.P., & Beier, J.S. (2019, March). "Children's prosocial facilitation of others' communicative goals." [Poster] Society for Research in Child Development, Baltimore, MD.
- Duong, S.**, Cherynak, N., & Beier, J. (2018, June). "Goals or equality: How young children choose between helping and fairness when distributing resources." [Poster] Society for Philosophy and Psychology Conference, Ann Arbor, MI.
- Terrizzi, B. F., Woodward, A. M., **Duong, S.**, Ventimiglia, J., & Beier, J. S. (2018, June). "Young children negatively evaluate people who do not help, even when helping is challenging." [Poster] International Congress of Infant Studies Conference, Philadelphia, PA.
- Kottegoda, Y., Mastropietro, A., & **Duong, S.** (2017, November). "Characteristics of modulo one sequences." [Talk] Mathematical Association of America Northeast Section Meeting, Fairfield, CT.
- Duong, S.**, McGrady, P. (2017, April). "The effects of school racial composition on racial bias in children." [Poster] Northeast Regional Honors Conference, Pittsburgh, PA.

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Ahl, R.E., **Duong, S.**, & Dunham, Y. (2017, January). "Young children use information about affluence to predict others' giving." [Poster] Society for Personality and Social Psychology Convention, San Antonio, TX.

Ramesh, S., **Duong, S.**, Charania, F., Dina, B. (2016, November). "Some properties of the wronskian." [Talk] Mathematical Association of America Northeast Section Meeting, Hartford, CT.

INVITED TALK & LOCAL PRESENTATIONS

Duong, S. (2022, March). "Parent-child interactions, questions, and math (sort of)." Talk presented at the Social Learning Laboratory (PI: Kathleen Corriveau) at Boston University, online.

Duong, S., & Libertus, M. (2022, November). "Quantifying dynamic structures in social interactions: Caregiver-child number talk as a case study." University of Pittsburgh Cognitive Psychology Talk Series, online.

Duong, S., & Libertus, M. (2021, November). "Profiles of parent interaction styles during math conversations with their children." University of Pittsburgh Cognitive Psychology Talk Series, online.

Duong, S., & Libertus, M. (2020, November/December). "Exploring relations between approximate number processing skills, eye movements, and math ability." Carnegie Mellon University, Center for the Neural Basis of Cognition Brain Bag Series and at the University of Pittsburgh Cognitive Psychology Talk Series, online.

Duong, S., & Libertus, M. (2020, November). "Exploring relations between approximate number system acuity, eye movements, and math ability." University of Pittsburgh Cognitive Psychology Talk Series, online.

Duong, S., Bachman, H., Votruba-Drzal, E., & Libertus, M. (2020, March). "What's in a question? Parents' question use in dyadic interactions and the relation to preschool-aged children's math abilities." [Poster] Graduate Student Exposition at the University of Pittsburgh. Cancelled due to COVID-19.

Duong, S., & Libertus, M. (2019, September). "Children's math abilities and the relation to risky decision making." University of Pittsburgh Cognitive Psychology Talk Series, Pittsburgh, PA.

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Duong, S., & Libertus, M. (2019, April). "Exploring the complexity of parents' questioning in parent- child interactions and the relation to children's math skills." University of Pittsburgh Cognitive Psychology Talk Series, Pittsburgh, PA.

*Hofman, S., **Duong, S.**, Libertus, M. (2019, April). "Parental praise and its relation to children's math skills." [Poster] University of Pittsburgh Psychology Department Student Research Poster Session, Pittsburgh, PA.

*Pitulski, S., **Duong, S.**, Libertus, M. (2019, April). "Question complexity in parent-child interactions and the relation to children's math abilities." [Poster] University of Pittsburgh Psychology Department Student Research Poster Session, Pittsburgh, PA.

Duong, S., & Libertus, M. (2019, March). "Exploring the complexity of parents' questioning in parent child interactions and the relation to children's math skills." University of Pittsburgh Council for Graduate Students in Education Conference, Pittsburgh, PA.

Kottegoda, Y., Mastropietro, A., & **Duong, S.** (2018, April). "Characteristics of modulo one sequences." [Poster] Southern Connecticut State University Spuyten Duyvil Undergraduate Mathematics Conference, New Haven, CT.

SERVICE

Quant Family Collective Peer Mentor Program

Sept. 2022-Present

University of Pittsburgh

- Provide cross-institutional mentorship, informal learning opportunities, and networking for graduate students and early career psychology researchers
- Facilitate community and build expertise and confidence in quantitative methods

Psychology Department Committee on Equity, Inclusion, and Community

Sept. 2018-Present

University of Pittsburgh

- Co-lead (2020-2022): Led department-wide meetings on ongoing efforts related to anti-racist and inclusive pedagogy, managed subcommittee efforts, and tracked budgets.
- *Undergraduate Subcommittee*: Plan and execute events aimed to promote undergraduate involvement in research (e.g., Annual Open Lab Event)
- *Outreach Subcommittee*: Organize talks and panel discussions with speakers from the university and local community who work with underrepresented groups in psychological research. Edit and distribute committee newsletter, with information about diversity initiatives and resources.

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Cognitive Program Talk Series, Student Organizer Jan. 2020-Mar. 2020
University of Pittsburgh

Graduate Peer Mentor Program Aug. 2019-Aug. 2020
University of Pittsburgh

Hot Metal Bridge (HMB) Peer Mentor Program Aug. 2019-Aug. 2021
University of Pittsburgh

Learning Research and Development Center Social Committee Jun. 2019-Present
University of Pittsburgh

- Plan and organize center-wide events, including welcome receptions, fundraisers, and the annual holiday party.

Cognitive Program Communication Committee Jul. 2019-Jul. 2020
University of Pittsburgh

- Compiled and disseminated resources for graduate students, e.g., information about course requirements, fellowships and scholarships, service opportunities, and funding.

MENTORING

University of Pittsburgh, Bachelor of Philosophy Thesis, Psychology Honors Thesis, and/or Directed Research Students

- Chelsea Carver (Summer 2020 – Spring 2022)
- Sasha Hofman (Fall 2019 – Spring 2022)
- Heather Booth (Fall 2021 – Spring 2022)
- Kelsey Phillips (Fall 2021 – Fall 2022)
- Andrew Mills (Fall 2019 – Fall 2021)
- Sierra Armstrong (Fall 2018 – Fall 2021)
- Sarah Pitulski (Fall 2018 – Spring 2021)

Boston University

- Claire Manley (Spring 2021 – Present)
- Alexis Pickering (Spring 2021 – Present)

TEACHING

Research Methods Lab Instructor, University of Pittsburgh (Fall 2021)

Cognitive Psychology Lab Instructor, University of Pittsburgh (Spring 2022)