

Melissa-Evelyn Libertus, PhD

Department of Psychology • Learning Research and Development Center
University of Pittsburgh
607 LRDC • 3939 O'Hara Street, Pittsburgh, PA 15260
Telephone: (412) 624-7457 • E-Mail: libertus@pitt.edu



Academic appointments

2018 – present: Associate professor, Dept. of Psychology, University of Pittsburgh, USA
2013 – 2018: Assistant professor, Dept. of Psychology, University of Pittsburgh, USA
2013 – present: Research scientist, Learning Research and Development Center
University of Pittsburgh, USA
2010 – 2013: Postdoctoral fellow, Dept. of Psychological and Brain Sciences
Johns Hopkins University, USA
Advisors: Lisa Feigenson & Justin Halberda

Education

2006 – 2010: PhD in Psychology and Neuroscience, Duke University, USA
Advisor: Elizabeth M. Brannon
2004 – 2006: M.A. in Psychology and Neuroscience, Duke University, USA
Advisor: Elizabeth M. Brannon
2001 – 2004: B.Sc. in Cognitive Science (summa cum laude), University of Osnabrück,
Germany

Scholarships and Awards

2015: Association for Psychological Science (APS) Rising Star Award
2015: Sofja Kovalevskaja Award, Alexander-von-Humboldt-Foundation (declined)
2014: International Mind Brain and Education Society (IMBES) Early Career Award
2011: Developmental Science Early Career Research Prize
2011: Building Bridges Travel Award, German Scholars Organization
2009 – 2010: Katherine Goodman Stern Fellowship, Duke University
2009: Frances Degen Horowitz Millennium Scholar, Society for Research in Child
Development
2007 – 2009: Three Conference Travel Grants, Duke University
2006 – 2007: George H. Hitchings New Investigator Award in Health Research and Training,
Triangle Community Foundation
2006 – 2009: Four Summer Vertical Integration Scholarships, Duke University
2004 – 2005: Fulbright Scholarship (declined)
2002 – 2006: German National Merit Foundation Scholarship (Studienstiftung des Deutschen
Volkes)

GRANTS

External grants

“Early Emergence of Socioeconomic Disparities in Mathematical Understanding”
National Science Foundation (DRL 1920545)
PI: Elizabeth Votruba-Drzal, Co-Is: Heather Bachman, Melissa Libertus
Funded period: 09/2019-08/2022
Total costs: \$2,108,317

“Cognitive and Biological Mechanisms in Pediatric Voice Therapy”

National Institutes of Health (R01DC017923)

PI: Katherine Verdolini Abbott, Co-Is: Patrick Barth, Dimitar Deliyski, Joseph Dohar, Melissa Libertus, Rita Patel

Funded period: 09/2019-08/2025

Total subaward: \$430,646

“How Parents Support Young Children’s Mathematical Thinking Across SES”

National Institutes of Health (R01HD093689)

PI: Melissa Libertus, Co-Is: Heather Bachman, Elizabeth Votruba-Drzal

Funded period: 05/2019-04/2024

Total costs: \$3,056,395

“Intrinsic and extrinsic influences on young children's mathematical abilities”

James S. McDonnell Foundation

PI: Melissa Libertus

Funded period: 01/2019-12/2024

Total costs: \$600,000

“Collaborative Research: Math Cognition In Toddlers From Latino and White families: Contributions Of Home Experiences With Mothers and Fathers”

National Science Foundation (HRD 1760844)

PIs: Catherine Tamis-LeMonda, Natasha Cabrera, Melissa Libertus

Funded period: 08/2018-07/2021

Total costs: \$450,000 (University of Pittsburgh only)

“APA Summer Undergraduate Psychology Research Experience (SUPRE)”

APA

PI: Jana Iverson; Co-PIs: Julie Fiez, Lauren Hallion, Tristen Inagaki, Melissa Libertus, Anna Marsland, Ed Orehek, Elizabeth Votruba-Drzal, Aidan Wright

Funded period: 06/2018 – 07/2018

Total costs: \$21,869

“NCS-FO: Neurobehavioral Integration of Visual and Semantic Number Knowledge and its Role for Individual Variation in the Math Ability of Children and Adults”

National Science Foundation (DUE 1734735)

PIs: Marc Coutanche, Julie Fiez, Melissa Libertus

Funded period: 09/2017 – 08/2020

Total costs: \$982,661

“APA Summer Undergraduate Psychology Research Experience (SUPRE)”

APA

PI: Jana Iverson; Co-PIs: Julie Fiez, Melissa Libertus, Elizabeth Votruba-Drzal, Aidan Wright

Funded period: 05/2017 – 07/2017

Total costs: \$21,874

“Tell me about math: A longitudinal training study on the effects of parent-child interactions and parental cognition on children’s math abilities”

National Science Foundation (DUE 1534830)

PI: Melissa Libertus, Co-PIs: Klaus Libertus, Aidan Wright

Funded period: 09/2015 – 08/2019

Total costs: \$499,750

“Revealing the importance of math-related parent-child interactions via EEG hyperscanning”

National Science Foundation (Supplement to DUE 1534830)

PI: Melissa Libertus, Co-PIs: Klaus Libertus, Aidan Wright
Funded period: 09/2016 – 08/2019
Total costs: \$ 99,194

Internal grants

“Personalizing Family Routines to Support 3-Year-Olds’ Math Skills”

Learning Research and Development Center Internal Award
PI: Diana Leyva, Co-PI: Melissa Libertus
Funded period: 09/2020 – 08/2022
Total costs: \$149,364

“Using human intracranial recordings to examine the spatiotemporal dynamics of symbolic and non-symbolic number processing”

Learning Research and Development Center Internal Award
PI: Melissa Libertus, Co-PI: Avniel Ghuman
Funded period: 07/2019 – 06/2021
Total costs: \$38,000

“Students in cognitive development learn to apply knowledge and communicate effectively through blog posts for parents”

Discipline-Based Science Education Research Center
PIs: Emily Braham, Melissa Libertus
Funded period: 09/2017 – 12/2017
Total costs: \$2,000

“How Low- and High-SES Parents Support Young Children’s Mathematical Thinking”

Learning Research and Development Center Internal Award
PI: Melissa Libertus, Co-PIs: Heather Bachman, Elizabeth Votruba-Drzal
Funded period: 07/2017 – 06/2019
Total costs: \$149,962

“How parents of low and high socioeconomic status support preschool-aged children’s mathematical thinking”

Central Research Development Funds (CRDF), University of Pittsburgh
PI: Melissa Libertus
Funded period: 07/2017 – 06/2019
Total costs: \$16,000

“The dangers of computation without quantitative meaning: Testing the case of symbolic estrangement”

Learning Research and Development Center Internal Award
PI: Melissa Libertus, Co-PIs: Julie Fiez, Christian Schunn
Funded period: 05/2014 – 06/2016
Total costs: \$87,955

“Tell me about math: A longitudinal training study on the effects of parent-child interactions and parental cognition on children’s math abilities”

Learning Research and Development Center Internal Award
PI: Melissa Libertus, Co-PI: Klaus Libertus
Funded period: 05/2015 – 02/2016
Total costs: \$149,873

Pending grants

“Collaborative Research: A Multi-Lab Investigation of Capacity Limits in Symbolic and Non-Symbolic Number Development”

National Science Foundation

PIs: David Barner, Sara Cordes, Lisa Feigenson, Elizabeth Gunderson, Daniel Hyde, Melissa Kibbe, Koleen McCrink, Melissa Libertus, Jessica Sullivan, Kristy vanMarle

PUBLICATIONS

Publications in peer-reviewed journals

* denotes graduate student mentee; ** denotes undergraduate student mentee

1. **Thippana, J., *Elliott, L., **Gehman, S., Libertus, K., **Libertus, M.** (in press). Parents' Use of Number Talk during Play at Home: Exploring Variability across Activities and Families. *Early Childhood Research Quarterly*.
2. Hellgren, K., Jacobson, L., Frumento, P., Bolk, J., Aden, U., **Libertus, M.**, Benassi, M. (2020). Cerebral visual impairment captured with a structured history inventory in extremely preterm born children aged 6.5 years. *Journal of American Association for Pediatric Ophthalmology and Strabismus*, 24(1), 28.e1-28.e8.
3. **Hanner, E., *Braham, E., *Elliott, L., **Libertus, M.** (2019). Increasing Math Talk in Adult-Child Interactions through Grocery Store Signs. *Mind Brain and Education*, 13(2), 110-118.
4. *Elliott, L., Feigenson, L., Halberda, J., **Libertus, M.** (2019). Bidirectional, longitudinal associations between math ability and approximate number system acuity in childhood. *Journal of Cognition and Development*, 20(1), 56-74.
5. *Braham, E., *Elliott, L., **Libertus, M.** (2018). Using Hierarchical Linear Models to Examine Approximate Number System Acuity: The Role of Task Parameters and Participant Characteristics. *Frontiers in Psychology*, 9, 2081.
6. *Navarro, M., *Braham, E., **Libertus, M.** (2018). Intergenerational associations of the approximate number system in toddlers and their parents. *British Journal of Developmental Psychology*, 36(4), 521-539.
7. *Braham, E., **Libertus, M.**, McCrink, K. (2018). Increasing Children's Spontaneous Focus on Number through Guided Parent-Child Interactions in a Children's Museum. *Developmental Psychology*, 54(8), 1492-1498.
8. *Braham, E., **Libertus, M.** (2018). When Approximate Number Acuity Predicts Math Performance: The Moderating Role of Math Anxiety. *PLoS One*, 13(5), e0195696.
9. Kersey, A., *Braham, E., Csumitta, K., **Libertus, M.**, Cantlon, J. (2018). No intrinsic gender differences in children's earliest numerical abilities. *npj Science of Learning*, 3(1), 12.
10. Wang, J., **Libertus, M.**, Feigenson, L. (2018). Hysteresis-induced changes in preverbal infants' approximate number precision. *Cognitive Development*, 47, 107-116.
11. **Zheng, P., **Libertus, M.** (2018). The Role of Parental Education and Income on Parents' Academic Beliefs and the Provision of Home Learning Opportunities for 4-8-year old Children. *Journal of Educational and Developmental Psychology*, 8(1), 118-132.

12. *Liu, R., Schunn, C., Fiez, J., **Libertus, M.** (2018). The integration between non-symbolic and symbolic numbers: Evidence from an EEG study. *Brain and Behavior*, 8, e00938.
13. **Libertus, M.**, Feigenson, L., Halberda, J. (2018). Infants extract frequency distributions from variable approximate numerical information. *Infancy*, 23(1), 29-44.
14. **Libertus, M.**, *Liu, A., Pikul, O., Jacques, T., Cardoso-Leite, P., Halberda, J., Bavelier, D. (2017). The impact of action videogame training on mathematical abilities in adults. *AERA Open*, 3(4), 1-13.
15. Möhring, W., *Liu, R., **Libertus, M.** (2017). Infants' speed discrimination: Effects of different ratios and spatial orientations. *Infancy*, 22(6), 762-777.
16. Libertus, K., **Libertus, M.**, Einspieler, C., Marschik, P. (2017). "What" matters more than "Why" - Neonatal behaviors initiate social responses. *Behavioral and Brain Sciences*, 40, e394.
17. **Libertus, M.**, *Braham, E., *Liu, R. (2017). Infants discriminate number: Evidence against the prerequisite of visual object individuation and the primacy of continuous magnitude. *Brain and Behavioral Sciences*, 40, e176.
18. *Braham, E., **Libertus, M.** (2017). Intergenerational Associations in Numerical Approximation and Mathematical Abilities. *Developmental Science*, 20(5), e12436.
19. **Libertus, M.**, Forsman, L., Aden, U., Hellgren, K. (2017). Deficits in Approximate Number System Acuity and Mathematical Abilities in 6.5-year-old Children Born Extremely Preterm. *Frontiers in Psychology*, 8, 1175.
20. *Elliott, L., *Braham, E., **Libertus, M.** (2017). Understanding Sources of Individual Variability in Parents' Number Talk with Young Children. *Journal of Experimental Child Psychology*, 159, 1-15.
21. **Libertus, M.**, Odic, D., Feigenson, L., Halberda, J. (2016). The Precision of Mapping Between Number Words and the Approximate Number System Predicts Children's Formal Math Abilities. *Journal of Experimental Child Psychology*, 150, 207-226.
22. Pailian, H., **Libertus, M.**, Feigenson, L., Halberda, J. (2016). Developmental Changes in Visual Short-Term Memory (VSTM) Capacity Between Ages 3 and 8 Years. *Attention, Perception, & Psychophysics*, 78, 1556-1573.
23. Einspieler, C., Bos, A., **Libertus, M.**, Marschik, P. (2016). The general movement assessment helps us to identify preterm infants at risk for cognitive dysfunction. *Frontiers in Psychology*, 7.
24. **Libertus, M.**, Odic, D., Feigenson, L., Halberda, J. (2015). A Developmental Vocabulary Assessment for Parents (DVAP): Validating parental report of vocabulary size in 2-7-year-olds. *Journal of Cognition and Development*, 16(3), 442-454.
25. *Keller, L. E., **Libertus, M.** (2015). Inhibitory control may not explain the link between approximation and math abilities in kindergarteners from middle class families. *Frontiers in Developmental Psychology*, 6, 685.
26. **Libertus, M.** (2015). The role of intuitive approximation skills for school math abilities. *Mind, Brain, and Education*, 9(2), 112-120.
27. **Libertus, M.**, Feigenson, L., Halberda, J., Landau, B. (2014). Understanding the mapping between numerical approximation and number words: Evidence from Williams syndrome and typical development. *Developmental Science*, 17(6), 905-919.

28. **Libertus, M.**, Marschik, P. B., Einspieler, C. (2014). Number word use in toddlerhood predicts number recall performance at seven years of age. *PLoS ONE* 9(6): e98573. doi:10.1371/journal.pone.0098573
29. **Libertus, M.**, Starr, A., Brannon, E. (2014). Number trumps area for 7-month-old infants. *Developmental Psychology*, 50(1), 108-112.
30. Starr, A., **Libertus, M.**, Brannon, E. (2013). Number sense in infancy predicts mathematical abilities in childhood. *Proceedings of the National Academy of Sciences*, 110(45), 18116-18120.

Article was featured in Science, Nature, one of top 100 stories in 2013 in Discover, National Geographic, Washington Post, and on NSF Science 360
31. **Libertus, M.**, Feigenson, L., Halberda, J. (2013). Numerical approximation abilities correlate with and predict informal but not formal mathematics abilities. *Journal of Experimental Child Psychology*, 116(4), 829-838.
32. Hellgren, K., Halberda, J., Forsman, L., Aden, U., **Libertus, M.** (2013). Compromised approximate number sense in extremely preterm school-aged children. *Developmental Medicine and Child Neurology*, 55(12), 1109-1114.
33. Starr, A., **Libertus, M.**, Brannon, E. (2013). Infants show ratio-dependent number discrimination regardless of set size. *Infancy*, 18(6), 927-941.
34. Feigenson, L., **Libertus, M.**, Halberda, J. (2013). Links between the intuitive sense of number and formal mathematics ability. *Child Development Perspectives*, 7(2), 74-79.
35. Odic, D., **Libertus, M.**, Feigenson, L., Halberda, J. (2013). Developmental change in the acuity of approximate number and area representations. *Developmental Psychology*, 49(6), 1103-1112.
36. **Libertus, M.**, Feigenson, L., Halberda, J. (2013). Is Approximate Number Precision a Stable Predictor of Math Ability? *Learning and Individual Differences*, 25, 126-133.

One of the most highly cited papers in Learning and Individual Differences during 2014, 2015, and 2016
37. **Libertus, M.**, Odic, D., Halberda, J. (2012). Intuitive sense of number correlates with math scores on college-entrance examination. *Acta Psychologica*, 141(3), 373-379.
38. Möhring, W., **Libertus, M.**, Bertin, E. (2012). Speed discrimination in 6- and 10-month-old infants follows Weber's Law. *Journal of Experimental Child Psychology*, 111, 405-418.
39. Wu, C.-T., **Libertus, M.**, **Meyerhoff, K., Woldorff, M. (2011). The temporal dynamics of object in visual cortex during the transition from distributed to focused spatial attention. *Journal of Cognitive Neuroscience*, 23(12), 4094-4105.
40. Cantlon, J., Davis, S., **Libertus, M.**, **Kahane, J., Brannon, E., Pelphrey, K. (2011). Intra-parietal white matter development predicts numerical performance in young children. *Learning and Individual Differences*, 21(6), 672-680.
41. **Libertus, M.**, Feigenson, L., Halberda, J. (2011). Preschool acuity of the approximate number system correlates with school math ability. *Developmental Science*, 14(6), 1292-1300.

One of top 5 downloads for 2013, 2014, 2015; article was featured in *New York Times*, *Science Daily*, and on *MSNBC*

42. **Libertus, M.**, Brannon, E., Woldorff, M. (2011). Parallels in stimulus-driven oscillatory brain responses to numerosity changes in adults and seven-month-old infants. *Developmental Neuropsychology*, 36(6), 651-667.
43. **Libertus, M.**, Brannon, E. (2010). Stable individual differences in number discrimination in infancy. *Developmental Science*, 13(6), 900-906.
44. **Libertus, M.**, Brannon, E. (2009). Behavioral and neural basis of number sense in infancy. *Current Directions in Psychological Science*, 18(6), 346-351.
45. **Libertus, M.**, **Pruitt, L., Woldorff, M., Brannon, E. (2009). Induced alpha-band oscillations reflect ratio-dependent number discrimination in the infant brain. *Journal of Cognitive Neuroscience*, 21(12), 2398-2406.
46. Cantlon, J., **Libertus, M.**, Pinel, P., Dehaene, S., Brannon, E., Pelphrey, K. (2009). The Neural Development of an Abstract Concept of Number. *Journal of Cognitive Neuroscience*, 21(11), 2217-2229.
47. Cantlon, J., Cordes, S., **Libertus, M.**, Brannon, E. (2009). Numerical Abstraction: It ain't broke. *Behavioral and Brain Sciences*, 32, 331-332.
48. **Libertus, M.**, Brannon, E., Pelphrey, K. (2009). Developmental changes in category-specific brain responses to numbers and letters in a working memory task. *Neuroimage*, 44(4), 1404-1414.
49. Cantlon, J., Cordes, S., **Libertus, M.**, Brannon, E. (2009). Comment on Log or Linear? Distinct Intuitions of the Number Scale in Western and Amazonian Indigene Cultures. *Science*, 323, 38b.
50. Brannon, E., **Libertus, M.**, Meck, W., Woldorff, M. (2008). Electrophysiological measures of time processing in infant and adult brains: Weber's law holds. *Journal of Cognitive Neuroscience*, 20(2), 193-203.
51. **Libertus, M.**, Woldorff, M., Brannon, E. (2007). Electrophysiological evidence for notation independence in numerical processing. *Behavioral and Brain Functions*, 3(1).
52. Schwank, I., Armbrust, S., **Libertus, M.** (2003). Prädikative versus funktionale Denkvorgänge beim Konstruieren von Algorithmen [Predicative versus functional thinking processes while constructing algorithms]. *Zentralblatt für Didaktik der Mathematik* [ZDM The International Journal on Mathematics Education], 35 (3), pp.79-85.

Publications in preparation

- *Duong, S., Bachman, H., Votruba-Drzal, E., **Libertus, M.** (under review). What's in a question? Parents' question use in dyadic interactions and the relation to preschool-aged children's math and language abilities.
- *Silver, A., Elliott, L., **Libertus, M.** (under review). When beliefs matter most: Examining children's math achievement in the context of parental math anxiety.
- *Silver, A., Elliott, L., **Imbeah, A., **Libertus, M.** (under review). Child and parent factors relate to math achievement in addition to, not through, spontaneous focusing on number.

- Libertus, M.**, Odic, D., Feigenson, L., Halberda, J. (under review). Visual training of approximate number sense improves auditory number sense and school math ability.
- *Liu, R., **Libertus, M.** (under review). Anterior and posterior EEG activity in non-symbolic number and symbolic number comparison in 7- to 8-year-old children: a multivariate approach.
- *Liu, R., Tremel, J., Fiez, J., Durisko, C., Schunn, C., **Libertus, M.** (under review). The integration of the symbolic and non-symbolic number representations in the human brain.
- Reynvoet, B., Ribner, A., Elliott, L., Van Steenkiste, M., Sasanguie, D., **Libertus, M.** (under review). Making Sense of the Relation between Number Sense and Math
- *Liu, A., Schunn, C., Fiez, J., **Libertus, M.** (in prep). Adjusting for adults' number estimation biases reveals symbolic integration of double-digit numbers.
- Bachman, H., Elliott, L., Navarro, M., *Duong, S., Votruba-Drzal, E., **Libertus, M.** (in prep). Triangulating multi-method assessments of parental support for early math development.
- Elliott, L., *Silver, A., **Imbeah, A., **Libertus, M.** (in prep). Actions may speak louder than words: Comparing methods of assessing children's spontaneous focusing on number.
- Möhring, W., Ribner, A., Segerer, R., **Libertus, M.**, Kahl, T., Troesch, L., Grob, A. (in prep). Children's growth in spatial skills: Causes and consequences for later mathematical thinking.

Book chapters

- Libertus, M.**, *Duong, S., *Silver, A. (2020). Mathematical Cognition. In: Benson, J.B. (Ed.), *Encyclopedia of Infant and Early Childhood Development, 2nd edition*, Vol. 2, Elsevier, pp. 311–318.
- Resnick, L., **Libertus, M.**, Schantz, F. (2019). The Future of Dialogic Education: An Opportunity and a Challenge. In: Mercer, N., Wegerif, R., Major, L. (Eds.) *The Routledge International Handbook of Research on Dialogic Education*. Routledge.
- Libertus, M.** (2019). Understanding the Link Between the Approximate Number System and Math Abilities. In: Geary, D. C., Berch, D. B., Mann Koepke, K. (Eds). *Cognitive Foundations for Improving Mathematical Learning*. Elsevier.

PRESENTATIONS

Invited Talks and Colloquia

- 05/2019: University of Science and Technology Beijing, China
- 03/2018: Colloquium, University of Bologna, Italy
- 07/2017: Colloquium, KU Leuven, Belgium
- 12/2016: Colloquium, Bucknell University, USA
- 10/2016: Developmental Brownbag, Carnegie Mellon University, USA
- 04/2016: Neuroscience and Education lab, New York University, USA
- 09/2013: Developmental Brownbag, Carnegie Mellon University, USA
- 09/2013: Developmental Brownbag, University of Pittsburgh, USA
- 09/2013: Cognitive Brownbag, University of Pittsburgh, USA
- 03/2013: JRG-Auswahlsymposia, University of Tübingen, Germany.
- 03/2013: Workshop on Early Childhood Development, University of Zurich, Switzerland.
- 02/2012: Colloquium, Stanford University, USA.
- 02/2012: Developmental Brownbag, Stanford University, USA.
- 01/2012: Colloquium, Peabody College, Vanderbilt University, USA.

- 01/2012: Colloquium, Dept. of Psychology and Learning Research and Development Center, University of Pittsburgh, USA.
- 11/2011: Regional ERP/EEG Research Meeting, Baltimore, USA.
- 06/2011: Colloquium, University of Tübingen, Germany.
- 05/2011: Colloquium, University of Gießen, Germany.
- 05/2011: Colloquium, Karolinska Institute, Sweden.
- 07/2009: Laboratory for Child Development, Johns Hopkins University.
- 05/2009: Internal seminar, Institute of Cognitive Neuroscience, University College London, UK.
- 05/2009: Colloquium, Centre for Brain and Cognitive Development, Birkbeck College, University of London, UK.
- 05/2009: Colloquium, Institute for Empirical Research in Economics, University of Zurich, Switzerland.
- 05/2009: Colloquium, Institute of Cognitive Science, University of Osnabrück, Germany.
- 09/2007: NeuroMath Workshop, University of Osnabrück, Germany.
- 02/2007: Cognitive, Affective and Social Neuroscience Series, Duke University.
- 11/2006: Cognitive Neuroscience Presentation Seminar Series, Duke University.
- 10/2005: Cognitive Neuroscience Presentation Seminar Series, Duke University.
- 04/2005: Duke University Lunchbox Series.

Conference Presentations - Oral

* denotes graduate student mentee; ** denotes undergraduate student mentee

1. Hespos, S., Shivaram, A., Anderson, E., Chavez, Y., Fritz, A., Jackson, R, Edwards, L. Powers, S., **Libertus, M.** (2020). Promoting playful learning using food pantry signs. *SRCD Special Topic Meeting: Learning through Play and Imagination. St Louis, MO, USA (rescheduled due to COVID-19).*
2. Elliott, L., Betancur, L., Bachman, H. J., Votruba-Drzal, E., **Libertus, M.** (06/2020). When time is tight, how do parents make math happen? *Mathematical Cognition and Learning Society (MCLS) Conference, Dublin, Ireland (cancelled due to COVID-19).*
3. Elliott, L., *Silver, A., **Imbeah, A., **Libertus, M.** (06/2020). Math skills predict children's spontaneous focusing on number through behavior, not talk. *Mathematical Cognition and Learning Society (MCLS) Conference, Dublin, Ireland (cancelled due to COVID-19).*
4. Ribner, A., *Silver, A., Elliott, L., & **Libertus, M.** (06/2020). Exploring effects of an early math intervention: The importance of parent-child interaction. *Mathematical Cognition and Learning Society (MCLS) Conference, Dublin, Ireland (cancelled due to COVID-19).*
5. Möhring, W., Ribner, A., Segerer, R., **Libertus, M.**, Kahl, T., Troesch, L., Grob, A. (06/2020). Preschoolers' growth in spatial abilities: Causes and Consequences for later mathematical thinking. *Mathematical Cognition and Learning Society (MCLS) Conference, Dublin, Ireland (cancelled due to COVID-19).*
6. Reynvoet, B., Ribner, A., Elliott, L., Van Steenkiste, M., Sasanguie, D., **Libertus, M.** (06/2020). Making Sense of the Relation between Number Sense and Math. *Mathematical Cognition and Learning Society (MCLS) Conference, Dublin, Ireland (cancelled due to COVID-19).*
7. *Silver, A., Elliott, L., **Libertus, M.** (06/2020). When beliefs matter most: Examining children's math achievement in the context of parental math anxiety. *Mathematical Cognition and Learning Society (MCLS) Conference, Dublin, Ireland (cancelled due to COVID-19)*

8. **Libertus, M.**, *Braham, E., McCrink, K. (08/2019). Increasing Math Talk During Play in a Children's Museum: The Role of Parent and Child Factors. *18th Biennial European Association for Research on Learning and Instruction (EARLI) Conference, Aachen, Germany.*
9. *Silver, A., *Elliott, L., **Libertus, M.** (06/2019). The Influence of Parent and Child Factors on Preschool-aged Children's Spontaneous Focusing on Number. *Mathematical Cognition and Learning Society (MCLS) Conference, Ottawa, Canada.*
10. *Elliott, L., **Thippiana, J., **Gehman, S., **Libertus, M.** (03/2019). Measuring Parental Math Stimulation for Young Children. *Biennial Meeting of the Society for Research in Child Development (SRCD), Baltimore, MD, USA.*
11. **Libertus, M.**, *Braham, E., *Elliott, L., **Hanner, E., Haslinger, A. (06/2018). Understanding variability in parental math talk and its influences on young children's math skills. *6th International Workshop on Advanced Learning Sciences, Pittsburgh, PA, USA.*
12. *Liu, R., * Braham, E., **Libertus, M.** (11/2017). Symbolic number comparison in 5- to 9-year-old children: Age-related changes in event-related potentials and their relation to formal math abilities. *Annual Meeting of the Society of Neuroscience, Washington, DC, USA.*
13. *Braham, E., **Libertus, M.**, McCrink, K. (10/2017). Improving Young Children's Spontaneous Focus on Number Through Guided Parent-Child Interactions in a Children's Museum. *Biennial Meeting of the Cognitive Development Society, Portland, OR, USA.*
14. Einspieler, C., Bos, F., **Libertus, M.**, Marschik, P. (10/2017). The general movement assessment helps us identify preterm infants at risk for cognitive dysfunction. *XXXIII International Symposium of the Polish Neonatal Society, Cracow, Poland.*
15. **Libertus, M.** (05/2017). Understanding the Link between the Approximate Number System and Math Abilities: Evidence from Training Studies and Observations of Intergenerational Transmission. *Math Cognition Conference, Nashville, TN, USA.*
16. **Libertus, M.**, *Elliott, L., *Braham, E. (04/2017). Parents' Own Number Sense and Math Abilities Explain Variability in Informal Math Talk with Their Children. *Biennial Meeting of the Society for Research in Child Development (SRCD), Austin, TX, USA.*
17. *Elliott, L., **Libertus, M.** (04/2017). Inhibitory Control and the Approximate Number System: Significant but Separate Predictors of Early Math Abilities. *Biennial Meeting of the Society for Research in Child Development (SRCD), Austin, TX, USA.*
18. Shembel, A., Verdolini Abbott, K., Galera, R., **Libertus, M.** (06/2016). Prospective Study of Voice Therapy in Children: Potential Cognitive Factors. *45th Annual Symposium of The Voice Foundation, Philadelphia, PA, USA.*
19. *Liu, A., Schunn, C., Fiez, J., **Libertus, M.** (07/2015). Symbolic Integration, Not Symbolic Estrangement, For Double-Digit Numbers. *37th Annual Meeting of the Cognitive Science Society, Pasadena, CA, USA.*
20. **Libertus, M.**, Hellgren, K., Forsman, L., Aden, U. (03/2015). Deficits in Mathematical Abilities and Approximate Number System Acuity in Children Born Extremely Preterm. *Biennial Meeting of the Society for Research in Child Development (SRCD), Philadelphia, USA.*
21. **Libertus, M.**, Odic, D., Feigenson, L., Halberda, J. (03/2015). Verbal number estimation predicts math ability and mediates the relation between numerical approximation and math ability. *Biennial Meeting of the Society for Research in Child Development (SRCD), Philadelphia, USA.*

22. Pailian, H., **Libertus, M.**, Feigenson, L., Halberda, J. (05/2014). On the dynamic nature of VWM: Separate limits for the storage and manipulation of information. *Vision Sciences Society (VSS) 14th Annual Meeting, St. Pete Beach, USA.*
23. Halberda, J., Bavelier, D., Landau, B., Hellgren, K., Forsman, L., Jacques, T., **Libertus, M.** (05/2013). Training of Number Sense transfers broadly. *Vision Sciences Society (VSS) 13th Annual Meeting, Naples, USA.*
24. **Libertus, M.**, Feigenson, L., Halberda, J. (04/2013). The Relationship Between Informal and Formal School Math Ability and Children's Basic Numerical Approximation Skills. *Biennial Meeting of the Society for Research in Child Development (SRCD), Seattle, USA.*
25. Starr, A., **Libertus, M.**, Brannon, E. (04/2013). Infants show ratio-dependent discrimination regardless of set size. *Biennial Meeting of the Society for Research in Child Development (SRCD), Seattle, USA.*
26. Halberda, J., **Libertus, M.**, Feigenson, L. (04/2013). The Approximate Number System (ANS): What is it and how might it be affecting classroom performance. *Annual Meeting of The American Educational Research Association (AERA), San Francisco, USA.*
27. **Libertus, M.**, Halberda, J., Feigenson, L. (04/2011). Approximate Number Discrimination Correlates With Math Abilities in Preschoolers. *Biennial Meeting of the Society for Research in Child Development (SRCD), Montreal, Canada.*
28. **Libertus, M.**, Wu, C., Harris, J., Woldorff, M. (11/2007). Attention can be shifted to a color pop-out prior to face-specific visual processing at that location. *Annual Meeting of the Society for Neuroscience (SfN), San Diego, USA.*
29. **Libertus, M.** (03/2007). Neuronale Marker der Zahlenverarbeitung in Säuglingen und Kindern. [Neural markers of number processing in infants and children]. *Gemeinsame Jahrestagung der Deutschen Mathematiker-Vereinigung und der Gesellschaft der Didaktik für Mathematik [Joint annual meeting of the German Association for Mathematicians and the Society for Mathematical Education], Berlin, Germany.*
30. Brannon, E., Cantlon, J., Cordes, S., Jordan, K., **Libertus, M.**, MacLean, E., & Suanda, U. (11/2006). Comparative and developmental approach to studying nonverbal numerical cognition. *Annual meeting of the Psychonomic Society, Houston, TX.*
31. **Libertus, M.** (06/2006). Electrophysiological correlates of symbolic vs non-symbolic number magnitude. *Numeracy and brain development (Numbra) Summer School, Finland.*
32. **Libertus, M.**, Armbrust, S. (09/2002). Prädikative versus funktionale Denkvorgänge beim Konstruieren von Algorithmen [Predicative versus functional thinking processes while constructing algorithms]. *Young Scientists Session, 43rd Conference of the German Psychological Society (DGPs), Berlin, Germany.*
33. Armbrust, S., Schwank, I., **Libertus, M.** (09/2002). Augenblickbewegungen beim Lösen von Matrizenaufgaben (QuaDiPF) [Eye-movements while solving matrices tasks (QuaDiPF)]. *43rd Conference of the German Psychological Society (DGPs), Berlin, Germany.*

Conference Presentations - Posters

* denotes graduate student mentee; ** denotes undergraduate student mentee

1. Feinstein, H., **Libertus, M.**, Awan, S., Galera, R., Verdolini Abbott, K. (submitted). Cognitive Influences in Pediatric Voice Treatment- a Preliminary Investigation. *Submitted to American Speech-Language-Hearing Association Convention, San Diego, CA, USA.*
2. Coulanges, L., Bachman, H., Votruba-Drzal, E., **Libertus, M.** (submitted). Digital media use and early learning. *Submitted to National Council on Family Relations (NCFR), St. Louis, MO, USA.*
3. Bachman, H., Elliott, L., Navarro, M., *Duong, S., Votruba-Drzal, E., **Libertus, M.** (submitted). Triangulating multi-method assessments of parental support for early math development. *Submitted to National Council on Family Relations (NCFR), St. Louis, MO, USA.*
4. Koch, G., Durisko, C., *Liu, R., **Libertus, M.**, Fiez, J., Coutanche, M. (2020). Neural representations of number across semantic, phonological, visual, and manual formats. *Accepted to the BRAIN Initiative Investigators Meeting, Bethesda, MD, USA (virtual meeting).*
5. Miller, P., Bachman, H., Betancur, L., Kammerzell, J., **Libertus, M.**, Votruba-Drzal, E. (2020). The Role of Play in Self-Regulation and Early Academic Development: Differences by SES. *SRCD Special Topic Meeting: Learning through Play and Imagination. St Louis, MO, USA (rescheduled due to COVID-19).*
6. *Silver, A. M., Smith, D., *Braham, E., Libertus, K., **Libertus, M.** (2020). Toddlers map number words to quantities, but only approximately. *International Congress of Infant Studies Biennial Congress, Glasgow, Scotland (cancelled due to COVID-19).*
7. *Silver, A. M., Benassi, M., **Libertus, M.** (2020). The development of visual form and motion discrimination over the first year of life. *International Congress of Infant Studies Biennial Congress, Glasgow, Scotland (cancelled due to COVID-19).*
8. Chen, Y., Mejia, V., Fuentes, H., Suh, D., *Silver, A., Mendelsohn, A., **Libertus, M.**, Tamis-LeMonda, C., Cabrera, N. (2020). Variability in early learning environments: Fathers, mothers, and toddlers from diverse families. *International Congress of Infant Studies Biennial Congress, Glasgow, Scotland (cancelled due to COVID-19).*
9. *Duong, S., Bachman, H., Votruba-Drzal, E., & **Libertus, M.** (2020). 'What's after six?': Parental math questions relate to 4-year-old children's math skills. *Mathematical Cognition and Learning Society (MCLS) Conference, Dublin, Ireland (cancelled due to COVID-19).*
10. Elliott, L., Bachman, H., Navarro, M., Betancur, L., Votruba-Drzal, E., **Libertus, M.** (2020). Contextual predictors of math support: Comparing measures of math at home. *Mathematical Cognition and Learning Society (MCLS) Conference, Dublin, Ireland (cancelled due to COVID-19).*
11. *Silver, A., Elliott, L., **Libertus, M.** (2020). Frequent math activities are only helpful for preschool-aged children who have acquired some foundational number knowledge. *Mathematical Cognition and Learning Society (MCLS) Conference, Dublin, Ireland (cancelled due to COVID-19).*
12. **Imbeah, A., Elliott, L., *Silver, A., **Libertus, M.** (2019). Do actions speak louder than words? Measuring children's focusing on number. *Biennial Meeting of the Cognitive Development Society, Louisville, KY, USA.*

13. Ribner, A., Elliott, L., *Silver, A., **Libertus, M.** (2019). Exploring effects of an early math intervention: The importance of parent-child interaction. *Biennial Meeting of the Cognitive Development Society, Louisville, KY, USA.*
14. *Duong, S., **Pitulski, S., Bachman, H., Votruba-Drzal, E., **Libertus, M.** (2019). What's in a question? Parents' questions in dyadic interactions and the relation to 4-year-old children's math abilities. *Biennial Meeting of the Cognitive Development Society, Louisville, KY, USA.*
15. *Silver, A., **Marlin, T., Elliott, L., **Libertus, M.** (2019). Factors predicting parental math input with their preschool-aged child. *Biennial Meeting of the Cognitive Development Society, Louisville, KY, USA.*
16. *Silver, A., **Convery, C., Elliott, L., **Libertus, M.** (2019). Executive functioning moderates the association between parental elicitation of math concepts and preschoolers' math performance. *Biennial Meeting of the Cognitive Development Society, Louisville, KY, USA.*
17. **Hughes, J., Elliott, L., Betancur, L., **Lemmon, M., Blatt, L., Kammerzell, J., Votruba-Drzal, E., Bachman, H., **Libertus, M.** (2019). Using time diaries to measure parental support for spatial skills. *Biennial Meeting of the Cognitive Development Society, Louisville, KY, USA.*
18. Koch, G., *Liu, G., **Libertus, M.**, Fiez, J., Coutanche, M. (2019). Neural Representations of Number across Semantic, Phonological, Visual, and Manual formats. *Society for Neuroscience, Chicago, IL, USA.*
19. *Liu, R., Koch, G., Coutanche, M., Fiez, J., **Libertus, M.** (2019). Representing numerical information across different formats in the adult brain. *Mathematical Cognition and Learning Society (MCLS) Conference, Ottawa, Canada.*
20. **Williams, T., *Silver, A., Libertus, K., **Libertus, M.** (2019). Influences of Stimulus Complexity on Infant Number Discrimination: Shapes vs. Faces. *Mathematical Cognition and Learning Society (MCLS) Conference, Ottawa, Canada.*
21. *Duong, S., **Pitulski, S., Bachman, H., Votruba-Drzal, E., **Libertus, M.** (2019). Measuring the Quality of Parent-Child Interactions and the Relation to Preschool-Aged Children's Math Skills. *Mathematical Cognition and Learning Society (MCLS) Conference, Ottawa, Canada.*
22. *Braham, E., **Dillaha, A., **Libertus, M.** (2019). How Preschool Teachers Use Math Talk Across Different Instructional Times and Activities. *Mathematical Cognition and Learning Society (MCLS) Conference, Ottawa, Canada.*
23. **Patronick, J., *Elliott, L., **Libertus, M.** (2019). Maternal Gender Biases in Early Exposure to Mathematics. *Mathematical Cognition and Learning Society (MCLS) Conference, Ottawa, Canada.*
24. *Duong, S., **Libertus, M.** (2019). Children's Math Abilities and the Relation to Risky Decision Making: A Study Proposal. *Mathematical Cognition and Learning Society (MCLS) Conference, Ottawa, Canada.*
25. **Libertus, M.**, Coutanche, M., Fiez, J., *Koch, G., *Liu, R. (2019). Neural integration of visual and semantic number knowledge in 4th graders and adults. *BRAIN Initiative Investigators Meeting, Washington, DC, USA.*
26. *Braham, E., McCrink, K., **Libertus, M.** (2019). Play Prompts for Parents in Children's Museums Increase Children's Exposure to Math Talk. *Biennial Meeting of the Society for Research in Child Development (SRCD), Baltimore, MD, USA.*

27. **Imbeah, A., *Elliott, L., **Libertus, M.** (2019). Relations between Spontaneous Focusing on Number, Non-symbolic Number Processing, and Math Abilities. *Biennial Meeting of the Society for Research in Child Development (SRCD), Baltimore, MD, USA.*
28. *Elliott, L., **Zheng, P., **Libertus, M.** (2019). Individual Differences in Parental Support for Math and Literacy in Early Childhood. *Biennial Meeting of the Society for Research in Child Development (SRCD), Baltimore, MD, USA.*
29. **Thippana, J., *Elliott, L., **Gehman, S., **Libertus, M.** (2019). Examining Individual Variability in Parental Number Talk During Math Activities at Home. *Biennial Meeting of the Society for Research in Child Development (SRCD), Baltimore, MD, USA.*
30. **Gehman, S., *Elliott, L., **Thippana, J., **Libertus, M.** (2019). Toys and Number Talk Elicitation: A Gendered Perspective. *Biennial Meeting of the Society for Research in Child Development (SRCD), Baltimore, MD, USA.*
31. *Braham, E., McCrink, K., **Libertus, M.** (2018). Characteristics of Parents and their Children Explain Differences in Math Talk at a Children’s Museum. *6th Biennial International Mind, Brain, and Education Society (IMBES) Conference, Los Angeles, CA, USA.*
32. *Braham, E., **Hanner, E., *Elliott, L., **Libertus, M.** (2018). Supermarket Signs Promote Math Talk among Adults and Young Children. *6th Biennial International Mind, Brain, and Education Society (IMBES) Conference, Los Angeles, CA, USA.*
33. *Liu, R., *Braham, E., **Libertus, M.** (2018). Symbolic and non-symbolic number comparisons in children rely on different brain regions: an event-related potentials (ERP) study. *6th Biennial International Mind, Brain, and Education Society (IMBES) Conference, Los Angeles, CA, USA.*
34. *Liu, R., *Braham, E., **Libertus, M.** (2018). Symbolic and non-symbolic number comparison in children: an EEG study. *6th International Workshop on Advanced Learning Sciences, Pittsburgh, PA, USA.*
35. *Braham, E., McCrink, K., **Libertus, M.** (2018). Creating Math-Related Parent-Child Interactions in a Children’s Museum. *6th International Workshop on Advanced Learning Sciences, Pittsburgh, PA, USA.*
36. Van Steenkiste, M., **Libertus, M.**, Reynvoet, B., Sasanguie, D. (2018). Getting to the bottom of the link between numerosity processing and mathematical achievement. *Groupe de contact “Numbers and the Brain”, Brussels, Belgium.*
37. **Thippana, J., *Elliott, L., **Libertus, M.** (2017). What Influences Variability in Parents’ Number Talk in the Lab and at Home? *Biennial Meeting of the Cognitive Development Society, Portland, OR, USA.*
38. *Elliott, L., Feigenson, L., Halberda, J., **Libertus, M.** (2017). Bidirectional, Longitudinal Associations between Math Ability and Approximate Number System Acuity in Childhood. *Math Cognition Conference, Nashville, TN, USA.*
39. *Braham, E., *Liu, R., **Libertus, M.** (2017). Variability in Math Talk During Parent-Child Interactions: The Role of Parents’ Math Ability and Approximate Number System Acuity. *Biennial Meeting of the Society for Research in Child Development (SRCD), Austin, TX, USA.*
40. *Braham, E., **Libertus, M.** (2016). Math anxiety moderates the relation between approximate number acuity and math performance. *International Mind Brain and Education Society Conference, Toronto, Canada.*

41. *Liu, R., *Liu, A., Schunn, C., Fiez, J., **Libertus, M.** (2016). The integration between non-symbolic and symbolic numbers and its relation to math ability. *International Mind Brain and Education Society Conference, Toronto, Canada.*
42. *Braham, E., **Libertus, M.** (2016). Math talk variability in preschool classrooms: The role of teachers' abilities and beliefs. *International Mind Brain and Education Society Conference, Toronto, Canada.*
43. *Liu, R., *Liu, A., Schunn, C., Fiez, J., **Libertus, M.** (2016). Automatic integration between non-symbolic and symbolic numbers in adults. *Math Cognition Conference, Fort Worth, TX, USA.*
44. *Liu, R., Schunn, C., Fiez, J., **Libertus, M.** (2016). Spontaneous integration between the representation of non-symbolic and symbolic numbers. *Annual Meeting of the Cognitive Neuroscience Society (CNS), New York, USA.*
45. *Braham, E., *Navarro, M., **Libertus, M.** (2015). Intergenerational Transmission of Numerical Ability: Evidence from Toddlerhood and Middle Childhood. *Biennial Meeting of the Cognitive Development Society, Columbus, USA.*
46. *Liu, R., Möhring, W., **Libertus, M.** (2015). The ratio and orientation effect in infants' and adults' speed discrimination. *Biennial Meeting of the Cognitive Development Society, Columbus, USA.*
47. Wang, J., **Libertus, M.**, Feigenson, L. (2015). Hysteresis-induced changes in infants' approximate number precision. *Biennial Meeting of the Cognitive Development Society, Columbus, USA.*
48. *Braham, E., **Libertus, M.** (2015). Parental influences on children's numerical and mathematical abilities. *Annual Meeting of the Jean Piaget Society, Toronto, Canada.*
49. *Keller, L., **Libertus, M.** (2015). Inhibitory control does not explain the link between approximation and math abilities in children. *Annual Meeting of the Jean Piaget Society, Toronto, Canada.*
50. *Braham, E., **Libertus, M.** (2015). Intergenerational Associations in Approximate Number System Acuity and Mathematical Abilities. *Math Cognition Conference, St. Louis, MO, USA.*
51. *Braham, E., **Libertus, M.** (2015). The Unique Contributions of Children's Numerical Approximation Skills for Various Math Abilities. *Biennial Meeting of the Society for Research in Child Development (SRCD), Philadelphia, USA.*
52. *Braham, E., Libertus, K., **Libertus, M.** (2015). Information Processing Patterns During Approximate Number Comparisons in Preschoolers and Adults: An Eye-tracking Study. *Biennial Meeting of the Society for Research in Child Development (SRCD), Philadelphia, USA.*
53. *Keller, L., **Libertus, M.** (2015). Examining the Importance of Child- and Parent-Level Cognitive Factors in Predicting Children's Early Math Abilities. *Biennial Meeting of the Society for Research in Child Development (SRCD), Philadelphia, USA.*
54. **Libertus, M.**, Halberda, J., Feigenson, L. (2014). Six-month-old Infants can Track Frequency Distributions of Numerosities. *19th Biennial International Conference on Infant Studies (ICIS), Berlin, Germany.*

55. **Libertus, M.**, Feigenson, L., Halberda, J. (2013). On the Stability of Individual Differences in Children's Numerical Approximation Skills. *Biennial Meeting of the Society for Research in Child Development (SRCD), Seattle, USA.*
56. Odic, D., **Libertus, M.**, Feigenson, L., Halberda, J. (2013). The quantity of quantity: are visual area and number represented by one system, or two? *Biennial Meeting of the Society for Research in Child Development (SRCD), Seattle, USA.*
57. Pailian, H., **Libertus, M.**, Feigenson, L., Halberda, J. (2013). Developmental Changes in Visual Short-Term Memory (VSTM) Capacity Between Ages 3 and 8 Years. *Biennial Meeting of the Society for Research in Child Development (SRCD), Seattle, USA.*
58. Pailian, H., **Libertus, M.**, Feigenson, L., Halberda, J. (2013). Measuring Individual Differences in Children's Visual Short-Term Memory Capacity using the Flicker Paradigm. *Biennial Meeting of the Society for Research in Child Development (SRCD), Seattle, USA.*
59. **Libertus, M.**, Starr, A., Brannon, E. (2012). Infants' sensitivity to changes in number versus surface area. *18th Biennial International Conference on Infant Studies (ICIS), Minneapolis, USA.*
60. Odic, D., **Libertus, M.**, Feigenson, L., Halberda, J. (2012). The development of number and area acuity in young children. *18th Biennial International Conference on Infant Studies (ICIS), Minneapolis, USA.*
61. Starr, A., **Libertus, M.**, Brannon, E. (2012). Small number discrimination in infancy: A case for approximate number representations. *18th Biennial International Conference on Infant Studies (ICIS), Minneapolis, USA.*
62. **Libertus, M.**, Feigenson, L., Halberda, J. (2011). Approximate Number Discrimination Predicts Later Math Ability in Preschoolers. *Seventh Biennial Meeting of the Cognitive Development Society, Philadelphia, USA.*
63. Libertus, K., **Libertus, M.** (2011). Similarities And Differences In Approximate Numerical Comparisons Between Children and Adults As Revealed By Eye Gaze. *Seventh Biennial Meeting of the Cognitive Development Society, Philadelphia, USA.*
64. **Libertus, M.**, Libertus, K. (2011). Differences in Strategies During Approximate Numerical Comparisons as Revealed by Eye-gaze Measures. *2011 Association for Psychological Science Annual Convention, Washington, DC, USA.*
65. **Libertus, M.**, Stevenson, A., Odic, D., Feigenson, L., Halberda, J. (2011). The Developmental Vocabulary Assessment for Parents (DVAP): A Novel Tool to Measure Vocabulary Size in 3- to 5-year-old Children. *Biennial Meeting of the Society for Research in Child Development (SRCD), Montreal, Canada.*
66. Möhring, W., **Libertus, M.**, Bertin, E. (2011). Speed Discrimination in 6- and 10-month-old Infant is Ratio-Dependent. *Biennial Meeting of the Society for Research in Child Development (SRCD), Montreal, Canada.*
67. **Libertus, M.**, Halberda, J., Feigenson, L. (2011). Approximate Number Discrimination Correlates With Math Abilities in Preschoolers. *Johns Hopkins 3rd Annual Postdoc Symposium, Baltimore, USA.*
68. **Libertus, M.**, Brannon, E. (2010). Behavioral Evidence for a Shared Mechanism of Number and Size Discrimination in Early but not Late Infancy. *1st Homewood Postdoctoral Poster Competition, Baltimore, USA.*

69. **Libertus, M.**, Brannon, E. (2010). Evidence for a shared system for number and area but not color discrimination in infancy. *24th Attention & Performance Meeting, Abbaye des Vaux de Cernay, France.*
70. Möhring, W., **Libertus, M.**, Bertin, E. (2010). Die Diskrimination von Geschwindigkeiten im Säuglingsalter. [Speed discrimination in infancy]. *8. LizentiandInnen- und DoktorandInnen-Kongress des Psychologischen Institutes der Universität Zürich (LiDoKo), Zürich, Schweiz. [8th Congress for Masters and PhD students at the Institute for Psychology of the University of Zurich, Switzerland].*
71. **Libertus, M.**, Brannon, E., Woldorff, M. (2010). Time course of stimulus-driven oscillatory synchronization and adaptation to numerical changes. *Annual Meeting of the Cognitive Neuroscience Society (CNS), Montreal, Canada.*
72. **Libertus, M.**, Brannon, E. (2010). Developmental trajectory of the relationship between numerical discrimination and other cognitive abilities in infancy. *17th Biennial International Conference on Infant Studies (ICIS), Baltimore, USA.*
73. **Libertus, M.**, Brannon, E. (2009). Evidence for Weber's Law in Infants' Numerical Discriminations From A New Change Detection Paradigm. *Biennial Meeting of the Society for Research in Child Development (SRCD), Denver, USA.*
74. **Libertus, M.**, Brannon, E., Woldorff, M. (2009). Stimulus-driven oscillatory responses to numerical changes: a novel frequency-tagging EEG paradigm. *Annual Meeting of the Cognitive Neuroscience Society (CNS), San Francisco, USA.*
75. **Libertus, M.**, Brannon, E., Pelphrey, K. (2008). Working memory for numbers, letters, and faces in 8-year-old children and adults. *Annual Meeting of the Cognitive Neuroscience Society (CNS), San Francisco, USA.*
76. **Libertus, M.**, Pruitt, L., Woldorff, M., Brannon, E. (2007). Electrophysiological markers of number processing in 7-month-old infants. *Numeracy and Brain Development (Numbra) Summer School, Greece.*
77. Cantlon, J., Davis, S., **Libertus, M.**, Brannon, E., Pelphrey, K. (2007). The Integrity of White Matter Pathways and Numerical Cognition in Adults and Young Children. *Annual Meeting of the Organization of Human Brain Mapping, Chicago, USA.*
78. Cantlon, J., **Libertus, M.**, Brannon, E., Pelphrey, K. (2007). The development of abstract numerical processing in parietal cortex. *Annual Meeting of the Vision Sciences Society, Sarasota, USA.*
79. **Libertus, M.**, Pruitt, L., Woldorff, M., Brannon, E. (2007). Electrophysiological markers of number processing in 7-month-old infants. *Annual Meeting of the Cognitive Neuroscience Society (CNS), New York, USA.*
80. Cantlon, J., **Libertus, M.**, Brannon, E., Pelphrey, K. (2007). Symbolic & Non-symbolic Number in the Developing Brain. *Annual Meeting of the Cognitive Neuroscience Society (CNS), New York, USA.*
81. **Libertus, M.**, Libertus, K., Suanda, S., Woldorff, M., Meck, W., Brannon, E. (2007). Behavioral and Neurophysiological Correlates of Interval Timing in Human Infants Follow Weber's Law. *Biennial Meeting of the Society for Research in Child Development (SRCD), Boston, USA.*
82. **Libertus, M.**, Woldorff, M., Brannon, E. (2006a). Electrophysiological Correlates of the Numerical Distance Effect. *5th Forum of European Neuroscience, Vienna, Austria.*

83. **Libertus, M.**, Woldorff, M., Brannon, E. (2006b). Electrophysiological correlates of number comparisons. *Annual Meeting of the Cognitive Neuroscience Society, San Francisco, USA.*
84. Libertus, K., **Libertus, M.**, Woldorff, M., Meck, W., Brannon, E. (2005). Behavioral and neurophysiological correlates of time processing in human infants. *Annual Meeting of the Society for Neuroscience, Washington, D.C., USA.*
85. Brannon, E., **Libertus, M.**, Meck, W., Woldorff, M. (2005). Neurophysiological correlates of time processing are modulated by interval differences in human infants and adults. *Annual Meeting of the Cognitive Neuroscience Society, New York, USA.*
86. **Libertus, M.** (2004). Unterschiede in Eigenschaftspräferenzen bei prädikativem versus funktionalem Problemlösen. [Differences in preferences for object features in the context of predicative versus functional problem solving]. *44th Conference of the German Psychological Society, Göttingen, Germany.*

TEACHING & MENTORING

Teaching

University of Pittsburgh

Fall 2019:	Cognitive Development (PSY 1330, advanced undergraduate level, overall teaching effectiveness: 4.64 out of 5)
Fall 2018:	Cognitive Development (PSY 2330, graduate level, overall teaching effectiveness: 4.64 out of 5)
Fall 2017:	Cognitive Development (PSY 1330, advanced undergraduate level, overall teaching effectiveness: 4.59 out of 5)
Spring 2017:	Cognitive Development (PSY 1330, advanced undergraduate level, overall teaching effectiveness: 4.36 out of 5)
Fall 2016:	Cognitive Development (PSY 2330, graduate level, overall teaching effectiveness: 3.78 out of 5)
Spring 2016:	Cognitive Development (PSY 1330, advanced undergraduate level, overall teaching effectiveness: 4.73 out of 5)
Fall 2015:	Mind, Brain & Education (PSY 1054, advanced undergraduate level, overall teaching effectiveness: 4.86 out of 5) Human Developmental Neuroscience (PSY 2376, graduate level, overall teaching effectiveness: 4.7 out of 5)
Spring 2015:	Cognitive Development (PSY 1330, advanced undergraduate level, overall teaching effectiveness: 4.47 out of 5)
Fall 2014:	Cognitive Development (PSY 2330, graduate level, overall teaching effectiveness: 4.85 out of 5)
Fall 2013:	Cognitive Development (PSY 1330, advanced undergraduate level, overall teaching effectiveness: 4.63 out of 5)

Duke University

Summer 2007:	Developmental Psychology (PSY 97, undergraduate level)
Spring 2007:	Teaching and Research Ethics (graduate student seminar)

Postdoctoral mentoring

Leanne Elliott	2019 - present
Andrew Ribner	2019 - present

Graduate student mentoring

Primary advisor

Shirley Duong	Cognitive Psychology National Science Foundation Graduate Research Fellowship, 2019-2022	2018 - present
Alex Silver	Cognitive Psychology LRDC Graduate Student Research Grant, 2020 Behavioral Brain Research Training Fellowship, 2019-2020	2018 - present
Ruizhe Liu	Cognitive Psychology Position starting May 2020: Postdoctoral fellow, Stanford University	2014 - 2020
Emily Braham	Cognitive Psychology Current position: Evaluation Manager, Boston Children's Museum Elizabeth Baranger Excellence in Teaching Award, 2019 Andrew Mellon Predoctoral Fellowship, 2018-2019 Tim Post Award for Research Excellence, 2017 Dr. Ruth L. Meyers Award for Mentoring Excellence, 2017 Grant for Research in Diversity, 2017 Mentor-Mentee Course Transformation Grant, 2017 Mini-Grant Award for Research on Diversity, 2016 Behavioral Brain Research Training Fellowship, 2015-2016	2013 - 2019

Milestone committee member

Griffin Koch	Cognitive Psychology, Masters	2019 - present
Kevin Soo	Cognitive Psychology, Dissertation	2018 - 2019
Allison Liu	Cognitive Psychology, Dissertation	2017 - 2018
Kathryn Hauschild	Developmental Psychology, Dissertation	2017 - 2018
Dana Rosen	Clinical-Developmental Psychology, Masters & Specialty exam, Dissertation	2015 - 2019
Bart Larsen	Cognitive Psychology, Specialty exam	2016
Leanne Elliott	Developmental Psychology, Specialty exam, Dissertation	2016 - 2019

Mentoring committee member

Debbie Bitran	Developmental Psychology	2019 - present
Xueying Ren	Cognitive Psychology	2019 - present
Ciara Willett	Cognitive Psychology	2017 - present
Nabila Jamal Orozco	Cognitive and Developmental Psychology	2016 - present
Kevin Soo	Cognitive Psychology	2014 - 2019
Regina Calloway	Cognitive Psychology	2014 - 2019
Laura Betancur	Developmental Psychology	2014 - present
Joshua Tremel	Cognitive Psychology	2014 - 2016
Brendan Barstow	Cognitive Psychology	2014 - 2105
Xiaoping Fang	Cognitive Psychology	2013 - 2019

Post-baccalaureate student mentoring

Monica Navarro	Hot Metal Bridge Program (now PhD student at the University of Pittsburgh)	2014 – 2015
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Undergraduate student mentoring

Bachelor of Philosophy students – University of Pittsburgh

Caitlin Convery	Psychology THINK Fellowship, Fall 2019	2021
Adwoa Imbeah	Psychology & Africana Studies major Curiosity Grant, Fall 2019 THINK Fellowship, Fall 2019 LRDC Summer Research Internship, Summer 2019 Summer Undergraduate Research Award, Summer 2018	2020
Abigail Dillaha	Neuroscience & Psychology major Chancellor's Undergraduate Research Fellowship, Fall 2017 Brackenridge Research Fellowship, Spring 2016	2018
Peter Zheng	Business, Economics, Political Science & Psychology major Brackenridge Research Fellowship, Fall 2017 PsychDRIVE Undergraduate Research Fellowship, Summer 2017 Chancellor's Undergraduate Research Fellowship, Spring 2017 Chancellor's Undergraduate Teaching Fellowship, Spring 2017	2018
Erinn Hanner	Humanities, Arts, and Social Sciences Research Fellowship, Fall 2016 Psychology & Studio Arts major Chancellor's Undergraduate Research Fellowship, Fall 2017	2017

Bachelor of Philosophy committee member – University of Pittsburgh

Sarah Lazarro	Neuroscience & Psychology major	2018
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Honors thesis students – University of Pittsburgh

Sasha Hofman	Psychology	2021
Anisha Venkatesh	Psychology Chancellor's Undergraduate Research Fellowship, Fall 2019 University Honors College Research Fellowship, Spring 2020	2020
Thomas Marlin	Psychology Chancellor's Undergraduate Research Fellowship, Spring 2020	2020
Wyatt Macejka	Psychology Chancellor's Undergraduate Research Fellowship, Fall 2017 Brackenridge Research Fellowship, Summer 2017 PsychDRIVE Undergraduate Research Fellowship, Summer 2017	2018
Jamie Patronick	Psychology	2018
Onnaleah Trentini	Neuroscience	2018
Ashley Whited	Neuroscience	2018
Joy Cui	Neuroscience Chancellor's Undergraduate Research Fellowship, Spring 2017 Brackenridge Research Fellowship, Summer 2016	2017
Sierra Struble	Neuroscience	2017
Jyothirmayi Thippana	Neuroscience	2017
Melanie Matyi	Neuroscience Chancellor's Undergraduate Research Fellowship, Fall 2016 Brackenridge Research Fellowship, Summer 2016	2016

Directed Research in Psychology or Neuroscience – University of Pittsburgh

1. Sierra Vogel	2020 - present
2. Chelsea Carver	2020 - present
3. Morgan Misko	2020 - present
4. Grace Savon	2020 - present
5. Olivia Knecht	2020 - present
6. Lucia Huerga	2020 - present
7. Junyi "Chloe" Gong	2019 - present
8. Victoria Santiago	2019 - present
9. Sydney Gordner	2019 - present
10. Andrew Mills	2019 - present
11. Brooke O'Hare	2019 - present
Chancellor's Undergraduate Research Fellowship, Spring 2020	
12. Sierra Armstrong	2019 - present
13. Erin McChesney	2019
14. Maggie Browne	2019 - present
15. Catherine Powell	2019
16. Rhiannon Stangl	2019 - present
Chancellor's Undergraduate Research Fellowship, Spring 2020	
17. Morgan Lemmon	2018 - 2019
18. Jocelyn Hughes	2018 - present
Summer Undergraduate Research Award, Summer 2019	
Chancellor's Undergraduate Research Fellowship, Spring 2020	
19. Aeliya Ahmed	2018 - present
20. Sarah Pitulski	2018 - present
Chancellor's Undergraduate Research Fellowship, Fall 2019	
21. Dara Czernikowski	2018 - 2019
22. Michaela Barley	2018
23. Shannon O'Leary	2018
24. Christine Shine	2018 - 2019
25. Kian Tabatabai	2018 - 2020
26. Chelsea Wyche	2018 - 2019
27. Georgia Williams	2018
28. Eliza Luxbacher	2018
29. Mia Nall	2018
30. Brianna Stein	2018 - 2019
31. Delaney Regan	2018
32. Erica Schweitzer	2018 - 2019
33. Donald Deep	2018 - 2019
34. Sarah Gehman	2017 - 2019
Brackenridge Research Fellowship, Summer 2018	
35. Miriam Bols	2017 - 2018
36. Taylor Williams	2017 - present
37. Azeen Athar	2017
38. Daniel Crawford	2017
Brackenridge Research Fellowship, Fall 2017	
39. Stephanie Quinones	2017 - 2018
Chancellor's Undergraduate Research Fellowship, Spring 2018	
40. Aditi Sharma	2017 - 2018
41. Simran Gill	2017
42. Elias Rappaport	2017
43. Kelly Staples	2017
44. Michelle Gamburg	2016 - 2019
Brackenridge Research Fellowship, Spring 2018	

45. Sonya Naik		2016 - 2017
46. Emily Pullman		2016 - 2017
47. Mahima Rajan		2016 - 2019
	THINK Research Fellowship, Spring 2019	
48. Xiaoyun Xu		2016 - 2017
49. Kayla Banner		2015 - 2016
50. Dana Cohen		2015
51. Lydia Grubic		2015 - 2016
52. Sejla Jukic		2015 - 2017
	PsychDRIVE Undergraduate Research Fellowship, Summer 2017	
53. Shreya Kolar		2015 - 2018
54. Carolyn Kotkiewicz		2015
55. Alexandra Lawall		2015 - 2016
56. Sarah Lazarro		2015 - 2016
57. Jenny Ly		2015 - 2016
58. Paige McLaughlin		2015 - 2017
59. Gabrielle Simon		2015 - 2016
60. Dominic Violi		2015 - 2016
61. Charles Yang		2015 - 2017
62. Laxmikausthubha Yaratha		2015 - 2016
63. Trevor Zwaan		2015 - 2016
	DeVito-Lipner Family Student Fund, Spring 2016	
64. Eva Dice		2014 - 2015
	DeVito-Lipner Family Student Fund, Spring 2015	
65. Amanda Hopcroft		2014
66. Rebecca Laher		2014 - 2015
67. Permveer Longia		2014 - 2015
68. Eliana Munro		2014 - 2015
	DeVito-Lipner Family Student Fund, Spring 2015	
	Spring Undergraduate Research Award, Spring 2015	
69. Megan Raymond		2014
70. Deborah Scialabba		2014
71. Leah Siegel		2014
72. Amy Veasey		2014 - 2016
73. Serena Virgi		2014 - 2015

Research mentor – Johns Hopkins University

2010 – 2013: Internship advisor at Johns Hopkins University (Rebecca Zhu, Cambria Litsey, Samantha Tuepker, Michelle Pargament, Geena Frumkin, Matthew Pulaski, Stephanie Caronna, Misti Jeffers, Brent Rappaport, Ruxue Shao, Lina Montoya, Karen Ho, Sean Ostro, Selin Zeytinoglu)

Research mentor – Duke University

2009: Frances Degen Horowitz Millennium Scholars mentor, Society for Research in Child Development
2008 – 2009: Independent study mentor at Duke University (Melissa Mang, Priya Patel)
2006 – 2010: Honors theses mentor at Duke University (Diana Hancock, Priya Patel, Tina Liang, Laura Pruitt)
2006 – 2008: Vertical Integration Program mentor at Duke University (Priya Patel, Melissa Mang, Stacey Blase, Lauren Marx, Laura Pruitt)

2005: NSF Mechanisms of Behavior Program mentor at Duke University (Anna Nehring)

SERVICE

Journal editorial board

2020 – present: Associate editor, Journal of Experimental Child Psychology

Ad hoc journal reviewing

Acta Psychologica	Journal of Experimental Child Psychology
Behavioral and Brain Sciences	Journal of Experimental Psychology: General
Biological Psychology	Journal of Experimental Psychology: Human Perception and Performance
Brain and Cognition	Journal of Experimental Psychology: Learning, Memory & Cognition
British Journal of Developmental Psychology	Journal of Numerical Cognition
British Journal of Educational Psychology	Journal of Pediatric Neurology
Cerebral Cortex	Learning and Individual Differences
Child Development	Memory & Cognition
Cognition	NeuroImage
Cognitive Science	Neuropsychologia
Cognitive Neuropsychology	Neuroscience Letters
Current Biology	Perception
Developmental Cognitive Neuroscience	Philosophical Psychology
Developmental Psychobiology	Philosophical Transactions B
Developmental Science	PLoS One
Early Childhood Research Quarterly	Prospects (UNESCO's quarterly review of comparative education)
Educational Psychology	Psychological Research
European Journal of Neuroscience	Psychological Science
European Journal of Psychology of Education	Psychonomic Bulletin & Review,
Experimental Brain Research	Psychophysiology
Frontiers in Developmental Psychology	Quarterly Journal of Experimental Psychology
Human Brain Mapping	Research in Developmental Disabilities
International Journal of Psychophysiology	Scientific Reports
Journal of Applied Research in Intellectual Disabilities	Zeitschrift für Psychologie (Journal of Psychology)
Journal of Behavioral Decision Making	
Journal of Cognition and Development	
Journal of Cognitive Neuroscience	
Journal of Cognitive Psychology	

Grant reviewing

Action Medical Research for Children, United Kingdom
Deutsche Forschungsgemeinschaft (DFG), Germany
European Research Council
Institut D'Etudes Avancees de Paris (Paris Institute for Advanced Study), France
Israel Science Foundation (ISF), Israel
National Science Foundation: College of Reviewers, USA
Nuffield Foundation, United Kingdom
Research Foundation Flanders (FWO), Belgium
Swiss National Science Foundation, Switzerland

Conference organization

- 2022: International Congress of Infant Studies, Program co-chair, Ottawa, Canada
2018: 6th International Workshop on Advanced Learning Sciences, Steering committee, Learning Research and Development Center, University of Pittsburgh

Conference reviewing

- 2018: Biennial Meeting of the Society for Research in Child Development
2017: Cognitive Development Society meeting
2016: 38th Annual Meeting of the Cognitive Science Society
2015: 20th Biennial International Conference on Infant Studies
2015: 37th Annual Meeting of the Cognitive Science Society
2011: 22nd Biennial Meeting of the International Society for the Study of Behavioural Development

Society leadership

- 2020 – present: Communications officer and executive board member, Mathematical Cognition and Learning Society (MCLS)

Professional memberships

Cognitive Development Society (CDS), Cognitive Neuroscience Society (CNS), International Mind Brain & Education Society (IMBES), International Society on Infant Studies (ICIS), Mathematical Cognition and Learning Society (MCLS), Society for Research in Child Development (SRCD)

Departmental and university service

- 2020 – present: Executive committee, Dept. of Psychology, University of Pittsburgh
2019: Tim Post Award committee, Dept. of Psychology, University of Pittsburgh
2019 – present: BRIDGE Center Development Fund evaluation committee, Carnegie Mellon University and University of Pittsburgh
2018 – present: Space committee, Learning Research and Development Center, University of Pittsburgh
2018 – 2019: Executive committee, Learning Research and Development Center, University of Pittsburgh
2018 – 2019: Executive committee, Dept. of Psychology, University of Pittsburgh
2018 – present: Faculty organizer, Cognitive Brownbag Seminar, University of Pittsburgh
2018 – 2019: Colloquium committee, Dept. of Psychology, University of Pittsburgh
2018 & 2019: Faculty search committee, Dept. of Psychology, University of Pittsburgh
2016 – 2019: Faculty Grants Committee, Dietrich School of Arts and Sciences, University of Pittsburgh
2016 – 2019: Co-chair, Communications Committee, Learning Research and Development Center, University of Pittsburgh
2016 – 2017: Faculty organizer, Cognitive Brownbag Seminar, University of Pittsburgh
2014 & 2015: Faculty search committee, Learning Research and Development Center, University of Pittsburgh
2014 – 2015: Colloquium committee, Dept. of Psychology, University of Pittsburgh
2013: Faculty search committee, Dept. of Psychology, University of Pittsburgh
2007 – 2010: Co-organizer Developmental Brownbag Series
Department of Psychology and Neuroscience, Duke University
2005 – 2007: International House Orientation Peer for international graduate students

OTHER INFORMATION

Collaborators

2010 – present:	Ulrika Aden	Karolinska Institute, Sweden
2016 – present:	Heather Bachman	University of Pittsburgh, USA
2019 – present:	David Barner	University of California San Diego, USA
2010 – present:	Daphne Bavelier	University of Geneva, Switzerland
2013 – present:	Mariagrazia Benassi	University of Bologna, Italy
2013 – present:	Roberto Bolzani	University of Bologna, Italy
2016 – present:	Natasha Cabrera	University of Maryland, College Park, USA
2009 – present:	Jessica Cantlon	University of Rochester, USA
2019 – present:	Sara Cordes	Boston College, USA
2016 – present:	Marc Coutanche	University of Pittsburgh, USA
2013 – present:	Julie Fiez	University of Pittsburgh, USA
2019 – present:	Elizabeth Gunderson	Temple University, USA
2010 – present:	Kerstin Hellgren	Karolinska Institute, Sweden
2019 – present:	Tzipi Horowitz-Kraus	Technion, Israel Institute of Technology, Israel
2019 – present:	Daniel Hyde	University of Illinois Urbana-Champaign, USA
2019 – present:	Einat Metzuyanin	Technion, Israel Institute of Technology, Israel
2016 – present:	Koleen McCrink	Barnard College, Columbia University, USA
2010 – present:	Wenke Möhring	University of Fribourg, Switzerland
2010 – present:	Darko Odic	University of British Columbia, Canada
2017 – present:	Lauren Resnick	University of Pittsburgh, USA
2017 – present:	Bert Reynvoet	KU Leuven, Belgium
2017 – present:	Delphine Sasanguie	KU Leuven, Belgium
2019 – present:	Jessica Sullivan	Skidmore College, USA
2016 – present:	Catherine Tamis-LeMonda	New York University, USA
2019 – present:	Kristy vanMarle	University of Missouri, USA
2013 – present:	Katherine Verdolini Abbott	University of Delaware, USA
2016 – present:	Elizabeth Votruba-Drzal	University of Pittsburgh, USA