Curriculum Vitae

Edward M. Hubbard

Associate Professor
Educational Psychology
University of Wisconsin–Madison
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Education

2004	Ph.D.	Psychology and Cognitive Science University of California, San Diego Thesis Advisors: Professor V.S. Ramachandran and Professor Geoffrey M. Boynton Dissertation "Psychophysical and Neuroimaging Investigations of Synesthesia"
2001	M.A.	Experimental Psychology University of California, San Diego Thesis Advisor: Professor V. S. Ramachandran
1998	B.A.	Cognitive Science University of California, Berkeley

Professional Experience

June 2020 – Present: Associate Professor, Educational Psychology, Neuroscience Training Program and Waisman Center, University of Wisconsin–Madison

April 2014 – June 2020: Neuroscience Training Program Faculty Member, University of Wisconsin–Madison.

August 2012 – June 2020: Assistant Professor, Educational Psychology and Waisman Center, University of Wisconsin–Madison

February 2011 – July 2012: Postdoctoral Affiliate of Vanderbilt Kennedy Center for Research on Human Development, Vanderbilt University.

October 2008 – July 2012: Post–doctoral fellow: Professor Bruce McCandliss, Department of Psychology and Human Development, Vanderbilt University.

July 2007 – September 2012: Consultant: Learnimation Corporation, CEO Sarah Manning, New York, NY.

November 2004 – September 2008: NUMBRA Post–doctoral fellow. Professor Stanislas Dehaene. INSERM (French equivalent of NIH) Unité 562 "Cognitive Neuroimaging Unit."

August 2000 – October 2004: Graduate Research Assistant, Professors V.S. Ramachandran and G.M. Boynton, University of California, San Diego, and Salk Institute for Biological Studies.

August 1999 – August 2000: Graduate Research Assistant, Professor V. S. Ramachandran, Department of Psychology, University of California, San Diego.

January 1999 – August 1999: Post–B.A. Research Assistant, Professor Joseph J. Campos, Department of Psychology, University of California, Berkeley.

January 1998 – May 1999: Undergraduate and Post–B.A. Research Assistant, Professor Stephen E. Palmer, Department of Psychology, University of California, Berkeley.

Awards and Honors

April, 2018: Inducted into UW-Madison Teaching Academy

February 2017: UW-Madison Award for Mentoring Undergraduates in Research, Scholarly and Creative Activities ($2000 to support mentoring)

September 2014: Highly Commended Book Award Winner in the Psychiatry Category for *The Oxford Handbook of Synesthesia* (Simner, J. & **Hubbard, E.M.** Eds.). British Medical Association.

January 2013 – January 2014: Madison Teaching and Learning Excellence (MTLE) Faculty Fellow ($4500 to improve undergrad teaching).

June – July 2001: Fellow, Summer Institute in Cognitive Neuroscience, Dartmouth College, Hanover, NH.

June 2000 – May 2001: UCSD Geckler Graduate Student Stipend (Competitive Award) $10,722.23

November 2000, 2002, 2003: UCSD Departmental Travel and Research Awards

Publications

Consistent with the fields of cognitive neuroscience and psychiatry I take a senior (last) author role on articles in which a student in my lab is listed as first author.

* indicates a peer-reviewed publication, underlined names indicate student or postdoc authors, º indicates work finished before appointment at UW-Madison, [·] numbers in brackets represent citation rates according to Google Scholar, 9/30/2024, 13447 citations in total, h-index 34, at least 600 citations per year every year since 2012.

Edited Book

1. Simner, J. & **Hubbard, E.M.** (Eds; 2013 and 2018). *The Oxford Handbook of Synaesthesia.* Oxford, UK: Oxford University Press. Hardcover version (2013): ISBN 978–0-19-960332-9. Reissue as paperback (2018): ISBN 978–0–19–883627–8. [195 book citations, not counting individual chapter citations]

Peer–Reviewed Articles

2. Starling-Alves, I., Gomides, M.R.A., Ribeiro, D.O., Haase, V.G. & **Hubbard, E.M.** (2024). From one half to 12th: acquisition of fraction writing in adult education program students and children. *Journal of Numerical Cognition* Preprint: https://osf.io/7vkmt doi: 10.5964/jnc.11475
3. *Starling Alves, I., Wronski, M.R., & **Hubbard, E.M.** (2022). Math anxiety differentially impairs symbolic, but not nonsymbolic, fraction skills across development. *Annals of the New York Academy of Sciences*, 1509 (1), 113-129. doi: 10.1111/nyas.14715 [21]
4. ***Hubbard, E.M.** & Matthews, P.G. (2021). Ratio-based perceptual foundations for rational numbers, and perhaps whole numbers, too? *Behavioral and Brain Sciences,* 44, 35-36. doi:10.1017/S0140525X2100114X [1]
5. *Kalra, P.B., **Hubbard, E.M.** & Matthews. P.G. (2020). Taking the relational structure of fractions seriously: Relational reasoning predicts fraction knowledge in elementary school children. *Contemporary Educational Psychology*, *62*, 101896 doi: 10.1016/j.cedpsych.2020.101896 [25]
6. *Kalra, P.B., Binzak, J.V., Matthews, P.G. & **Hubbard, E.M.** (2020). Symbolic fractions elicit an analog magnitude representation in school-age children. *Journal of Experimental Child Psychology, 195,* 104844 doi:10.1016/j.jecp.2020.104844 [44]
7. *Binzak, J.V. & **Hubbard, E.M.** (2020). No calculation necessary: Accessing rational magnitudes through fraction notation. *Cognition, 199:* 104219 doi: 10.1016/j.cognition.2020.104219 [23]
8. *Colling, L. et al including Toomarian, E.Y. and **Hubbard, E.M.** author order is alphabetical after first author (2020). Registered Replication Report on Fischer, Castel, Dodd, and Pratt (2003). *Advances in Methods and Practices in Psychological Science, 3*(2):143-162. doi:10.1177/2515245920903079 [49]
9. *Toomarian, E.Y., Gosavi, R.S., **Hubbard, E.M.** (2019). Implicit and explicit spatial-numerical representations diverge in number-form synesthetes. *Consciousness and Cognition*. 75: 102806 doi:10.1016/j.concog.2019.102806 [5]

10. *Toomarian, E.Y. & **Hubbard, E.M.** (2020). A SNARC in the mind or in the hand? A response to Shaki & Fischer. *Neuroscience and Biobehavioral Reviews.* 119, 512-513 doi: 10.1016/j.neubiorev.2018.11.018 [3]
11. *Toomarian, E.Y., Meng, R. & **Hubbard, E.M.** (2019). Individual differences in implicit and explicit spatial processing of fractions *Frontiers in Psychology,* 10:596. doi: 10.3389/fpsyg.2019.00596 [10]
12. *Gosavi, R.S. & **Hubbard, E.M.** (2019). A colorful advantage in iconic memory. *Cognition*, 187:32-37 doi: 10.1016/j.cognition.2019.02.009 [4]
13. *Cochrane, A.†, Cui, L.†, **Hubbard, E.M.** & Green, C. S. (2019). "Approximate number system" training: A perceptual learning approach. *Attention, Perception & Psychophysics*, 81(3):621–636. doi: 10.3758/s13414-018-01636-w †Co-first authors. [18]
14. *Toomarian, E.Y. & **Hubbard, E.M.** (2018). On the genesis of spatial-numerical associations: Evolutionary and cultural factors co-construct the mental number line. *Neuroscience and Biobehavioral Reviews,* 90:184–199 doi: 10.1016/j.neubiorev.2018.04.010 [89]
15. *Toomarian, E.Y. & **Hubbard, E.M.** (2018). The fractions SNARC revisited: Processing fractions on a consistent mental number line. *Quarterly Journal of Experimental Psychology.* 71(8) 1761–1770 10.1080/17470218.2017.1350867. [18]
16. *Sidney, P.G., Thompson, C.A., Matthews, P.G. & **Hubbard, E.M.** (2017). From continuous magnitudes to symbolic numbers: The centrality of ratio. *Behavioral and Brain Sciences*, 40:e190 doi:10.1017/S0140525X16002284 [29]
17. *Matthews, P.G. & **Hubbard, E.M.** (2017). Making space for spatial proportions. *Journal of Learning Disabilities.* 50(6):644-647 10.1177/0022219416679133 [17]
18. ***Hubbard, E.M.**, Matthews, P.G. & Samek, A. (2016). Using online compound interest tools to improve financial literacy. *Journal of Economic Education*, 47(2):106-120. DOI:10.1080/00220485.2016.1146097 [19]
19. *Matthews, P.M., Lewis, M.R. & **Hubbard, E.M.** (2016). Individual differences in nonsymbolic ratio processing predict symbolic math performance. *Psychological Science*, 27(2):191-202. doi:10.1177/0956797615617799 [187]
20. *Simner, J., Carmichael, D.A., **Hubbard, E.M.**, Morris, Z. & Lawrie, S.M. (2015). Rates of white matter hyperintensities compatible with the radiological profile of multiple sclerosis within self-referred synesthete populations. *Neurocase.* 21(3):322-330. doi:10.1080/13554794.2014.892625 [9]
21. *Viarouge, A., **Hubbard, E.M**. & Dehaene, S. (2014). The organization of spatial reference frames involved in the SNARC effect *Quarterly Journal of Experimental Psychology.* 67(8):1484-1499. doi:10.1080/17470218.2014.897358 [64]
22. *Oberman, L., **Hubbard, E.M.** & McCleery, J.P. (2014). Associative learning alone is insufficient for the evolution and maintenance of the human mirror neuron system. *Behavioral and Brain Sciences.* 37(2): 212 – 213 doi: 10.1017/S0140525X13002422. [6]
23. *Viarouge, A., **Hubbard, E.M**. & McCandliss, B.D. (2014). The cognitive mechanisms of the SNARC effect: an individual differences approach. *PLOS One.* 9(4): e95756 doi:10.1371/journal.pone.0095756. [96]
24. *Oberman, L.M., McCleery, J.P., **Hubbard, E.M.**, Bernier, R., Wiersema, J.R. Raymaekers, R. & Pineda, J.A. (2013). Developmental changes in mu suppression to observed and executed actions in autism spectrum disorders. *Social Cognitive and Affective Neuroscience.* 8(3): 300–304 doi:10.1093/scan/nsr097. [109]
25. *º**Hubbard, E.M.**, Brang, D. and Ramachandran, V.S. (2011). The cross–activation theory at 10. **5**(2):152–177 *Journal of Neuropsychology.* doi:10.1111/j.1748–6653.2011.02014 [201]
26. *ºViarouge, A., **Hubbard, E. M.**, Dehaene, S. & Sackur, J. (2010). Number line compression and the illusory perception of random numbers. *Experimental Psychology.* 57(6): 446–454. doi:10.1027/1618–3169/a000055 [34]
27. *ºBrang, D., **Hubbard, E.M.**, Coulson, S., Huang, M. & Ramachandran, V.S. (2010). Magnetoencepalography reveals early activation of V4 in grapheme–color synesthesia. *Neuroimage.* **53**(1):268–274. doi:10.1016/j.neuroimage.2010.06.008 [151]

28. *ºWilliams, L.E., Ramachandran, V.S., **Hubbard, E.M.**, Braff, D.L. & Light, G.A. (2010). Superior size–weight illusion performance in patients with schizophrenia: Evidence for deficits in forward models and multisensory integration. *Schizophrenia Research.* **121**(1–3):101–106. doi:10.1016/j.schres.2009.10.021 [29]
29. *ºBerteletti, I., **Hubbard, E.M.** & Zorzi, M. (2010). Implicit versus explicit interference effects in a number–color synesthete. *Cortex.* **46**(2): 170–177 doi:10.1016/j.cortex.2008.12.009 [27]
30. *º**Hubbard, E.M.**, Ranzini, M., Piazza, M. & Dehaene, S. (2009). What information is critical to elicit interference in number–form synesthesia? *Cortex,* **45**(10):1200–1216. doi:10.1016/j.cortex.2009.06.011 [72]
31. *ºRanzini, M., Piazza, M., Dehaene, S. & **Hubbard, E.M.** (2009). Neural mechanisms of attentional shifts due to irrelevant spatial and numerical cues. *Neuropsychologia,* **47**(12): 2615–2624. doi:10.1016/j.neuropsychologia.2009.05.011 [111]
32. *ºKnops, A., Thirion, B., **Hubbard, E.M.,** Michel, V. & Dehaene, S. (2009). Recruitment of an area involved in eye movements during mental arithmetic. *Science,* **324**(5934):1583–1585. doi:10.1126/science.1171599 [511]
33. *º**Hubbard, E. M.**, Diester, I., Cantlon, J. F., Ansari, D. van Opstal, F. & Troiani, V. (2008). The evolution of numerical cognition: From number neurons to linguistic quantifiers. *Journal of Neuroscience.* **28**(46):11819–11824. [57]
34. *º**Hubbard, E. M.** (2008). Synaesthesia: The sounds of moving patterns. *Current Biology*, **18**(15): R657–R659. [15]
35. *º**Hubbard, E.M.** (2007). A real red letter day. *Nature Neuroscience.* **10**(6):671–672. [32]
36. *º**Hubbard, E.M.** (2007). Neurophysiology of synesthesia. *Current Psychiatry Reports.* **9**(3): 193–199. [213]
37. *ºSimner, J. & **Hubbard, E.M.** (2006). Variants of synaesthesia interact in cognitive tasks: Evidence for implicit associations and late connectivity in cross–talk theories. *Neuroscience.* **143**(3):805–814. [87]
38. *ºThirion, B., Duchesnay, E., **Hubbard, E.M.**, Dubois, J., Poline, J.–B., Lebihan, D. & Dehaene, S. (2006). Inverse retinotopy: Inferring the visual content of images from brain activation patterns. *Neuroimage.* **33**(4):1104–1116. [428]
39. *º**Hubbard, E.M.,** Manohar, S. & Ramachandran, V.S. (2006). Contrast affects the strength of synesthetic colors. *Cortex,* **42**(2): 184–194. [70]
40. *º**Hubbard, E.M**. & Ramachandran, V.S. (2005). Neurocognitive mechanisms of synesthesia. *Neuron,* **48**(3): 509–520. [617]
41. *º**Hubbard, E.M.**, Piazza, M., Pinel, P. & Dehaene, S. (2005b). Interactions between number and space in parietal cortex. *Nature Reviews Neuroscience,* **6**(6): 435–448. [1598]
42. *º**Hubbard, E.M.,** Arman, A.C., Ramachandran, V.S. & Boynton, G.M. (2005a). Individual differences among grapheme–color synesthetes: Brain–behavior correlations. *Neuron*, **45**(6): 975–985. [469]
43. *ºOberman, L.M., **Hubbard, E.M.**, McCleery, J.P., Altschuler, E.L., Ramachandran, V.S. & Pineda, J.A. (2005) EEG Evidence for Mirror Neuron dysfunction in autism. *Cognitive Brain Research*, **24**(2): 190–198. [1695]
44. *º**Hubbard, E.M.** & Ramachandran, V.S. (2004). The size–weight illusion, emulation, and the cerebellum. *Behavioral and Brain Sciences*, **27**(3): 407–408. [3]
45. *ºRamachandran, V.S. & **Hubbard, E.M.** (2003). The phenomenology of synaesthesia. *Journal of Consciousness Studies*, **10**(8): 49–57. [301 *two scholar records]
46. *º**Hubbard, E.M.** & Ramachandran, V.S. (2003). Refining the experimental lever: A reply to Shannon and Pribram. *Journal of Consciousness Studies,* **9**(3):77–84. [42]
47. *º**Hubbard, E.M.** (2003). A discussion and review of Uttal (2001) *The New Phrenology*. *Cognitive Science Online*, **1**: 22–33. http://cogsci-online.ucsd.edu/1/1-3.pdf [34]
48. *ºRamachandran, V.S. & **Hubbard, E.M.** (2001b) Synaesthesia: A window into perception, thought and language. *Journal of Consciousness Studies.* **8**(12): 3–34. [2540]
49. *ºRamachandran, V.S & **Hubbard, E.M.** (2001a). Psychophysical investigations into the neural basis of synesthesia. *Proceedings of the Royal Society, B*., **268**(1470): 979–983. [695]

50. *ºAnderson, D. I., **Hubbard, E.M**., Campos, J. J., Barbu–Roth, M. A., Witherington, D. & Hertenstein, M. (2000) Probabilistic epigenesis, experience, and psychological development in infancy. *Infancy*, **1**(2): 245–251. [11]
51. *ºCampos, J. J., Anderson, D. I., Barbu–Roth, M.A, **Hubbard, E.M**., Hertenstein, M. & Witherington, D. (2000) Travel Broadens the Mind. *Infancy,* **1**(2): 149–219. [1362]

Book Chapters

52. Gosavi, R. & **Hubbard, E.M.** (2019). How synesthesia may lead to enhanced memory (Chapter 14). In. K. Sathian and V.S. Ramachandran. *Multisensory Perception: From Laboratory to Clinic*. (p. 301-318) Elsevier.
53. Lewis, M.R., Matthews, P.G. & **Hubbard, E.M.** (2015). Neurocognitive Architectures and the Nonsymbolic Foundations of Fractions Understanding. In D.B. Berch, D.C. Geary, and K.M. Koepke (Eds.) *Development of Mathematical Cognition-Neural Substrates and Genetic Influences*. (p. 141-160) Elsevier. ISBN: 978-0128018712. [95]
54. **Hubbard, E.M.,** Brang, D. & Ramachandran, V.S. (2014). The cross-activation theory at ten. In M. Josè De Cordoba, D. Riccò & S. Day (eds.). *Synaesthesia: Theoretical, Artistic and Scientific Foundations*, Granada, Spain, July 2014, pp. 176-196. Print Edition, ISBN: 978-84-939054-6-0, eBook Edition, ISBN: 978-84-939054-9-1.
55. **Hubbard, E.M.** (2013). Synaesthesia and Functional Imaging. In J. Simner. & **E.M. Hubbard** (Eds). *The Oxford Handbook of Synaesthesia.* Oxford, UK: Oxford University Press. ISBN 9780199603329 (HB). [14]
56. Simner, J. & **Hubbard, E.M.** (2013). Synaesthesia in School–aged Children. In J. Simner. & **E.M. Hubbard** (Eds). *The Oxford Handbook of Synaesthesia.* Oxford, UK: Oxford University Press. ISBN 9780199603329 (HB). [13]
57. **Hubbard, E.M.** (2013). Synesthesia [1000 word entry]. In H. Pashler (Ed.) *Encyclopedia of the Mind.* (p. 725–727) Thousand Oaks, CA. SAGE Reference.
58. º**Hubbard, E.M.,** Brang, D. & Ramachandran, V.S. (2012) Diez años de la teoría de la interactivación" in M. José De Córdoba & Dina Riccò (Eds.) *Sinestesia: Los Fundamentos Teóricos, Artísticos y Sientíficos*. Granada: Ediciones Fundación Internacional Artecittà. ISBN–13: 978–84–939054–1–5.
59. º**Hubbard, E.M.**, Piazza, M., Pinel, P. & Dehaene, S. (2009). Numerical and spatial intuitions: A role for posterior parietal cortex? In L. Tommasi, L. Nadel and M.A. Peterson (Eds.) *Cognitive Biology: Evolutionary and Developmental Perspectives on Mind, Brain and Behavior.* (pp. 221–246). Cambridge, MA: MIT Press [51]
60. ºRamachandran, V.S. & **Hubbard, E.M.** (2006). Synesthesia: what does it tell us about the emergence of qualia, metaphor, abstract thought, and language? In L. van Hemmen & T.J. Sejnowski (Eds.) *23 Problems in Systems Neuroscience.* (pp. 432–473) New York, NY: Oxford University Press. [17]
61. ºRamachandran, V.S. & **Hubbard, E.M.** (2005). The emergence of the human mind: Some clues from synesthesia. In L. Robertson & N. Sagiv (Eds.) *Synesthesia: A Cognitive Neuroscience Perspective.* (pp. 147–190) New York, NY: Oxford University Press. [73]
62. ºRamachandran, V.S. & **Hubbard, E.M.** (2004). What can neuroscience teach us about human nature and the potential for change? *Aspen Foundation Symposium: The Internet and the University.* (pp. 15–33). Boulder, CO: Educause.
63. ºRamachandran, V.S., **Hubbard, E.M,** & Butcher, P.A. (2004). Synesthesia, cross–activation and the foundations of neuroepistemology. In G. Calvert, C. Spence & B. Stein (Eds.) *Handbook of Multisensory Processes.* (pp. 867–883). Cambridge, MA: MIT Press. [44]

Diffusion of Scientific Knowledge

64. ºRamachandran, V.S. & **Hubbard, E.M.** (2006b). Hearing colors, tasting shapes. *Scientific American Special Issue: Secrets of the Senses.* 76–83 (October, 2006; updated from Ramachandran & Hubbard, 2003) [22].
65. ºRamachandran, V.S. & **Hubbard, E.M.** (2006a). La synesthésie ou la confusion des sens [Synesthesia, or the confusion of the senses]. *Cerveau et Psycho.*72–77 (March, 2006; updated and translated from Ramachandran & Hubbard, 2003).
66. º**Hubbard, E.M** (2005) L'étrange monde du synesthète [The strange world of the synesthete]. *Médecine et Enfance.* 667–674 (December, 2005).
67. ºRamachandran, V.S. & **Hubbard, E.M.** (2005b) Hearing colors, tasting shapes. *Scientific American Mind.* 16–23 (October, 2005; updated from Ramachandran & Hubbard, 2003) [18].
68. ºRamachandran, V.S. & **Hubbard, E.M.** (2005a). Hearing colors, tasting shapes. Reprinted in Axelrod, R.B., Cooper, C.R., Warriner, A.M. *Reading Critically, Writing Well: A Reader and Guide,* 7th edition, (436–452) New York: Bedford, St. Martin's Press.
69. ºRamachandran, V.S. & **Hubbard, E.M.** (2003). Hearing colors, tasting shapes. *Scientific American.*52–59 (May, 2003). [376 *Note: three records]

Interviews in Books

70. **Hubbard, E. M.** (2020). Edward M. Hubbard in A.V. Sidoroff-Dorso, S.A. Day & J. Jewanski (Eds). Synaesthesia: Opinions and Perspectives 30 Interviews with Leading Scientists, Artists and Synaesthetes. (pp. 75-80). ISBN 978-3-8405-0228-6
71. **Hubbard, E. M.** (2019). Edward M. Hubbard in A.V. Sidoroff-Dorso and S. A. Day (Eds). *Синестезия: мнения и перспективы. 26 просмотров на один увлекательный феномен* [Synaesthesia: opinions and perspectives. 26 views on one fascinating phenomenon]. Moscow: Moscow State University of Psychology and Education (pp., 61-66).

Manuscripts submitted, under revision, and in preparation

72. Park, Y., Binzak, J.V., Kalra, P.B., Matthews, P.G. & **Hubbard, E.M.** (submitted). Developmental changes in nonsymbolic and symbolic fractions processing: A cross-sectional fMRI study. Preprint: https://osf.io/2jktr/
73. Starling-Alves, I., Liao, X., Huang, Q., Bolt, D.M., **Hubbard, E.M.** & Matthews, P.G. (submitted). Tracking fraction knowledge development using grade-appropriate assessment

Research Support

Pending

Co-PI **Hubbard**: Whole Number Bias or Weak Magnitude? Identifying and Intervening with Distinct Groups of Fraction Learners NSF Discovery Research PreK-12 (DRK-12) Total costs $450,000 UW-Madison sub-award $135,00

Current

PIs: Many Numbers Leadership Team, July 15, 2022 – July 14, 2026, NSF Division on Research in Learning (DRL) "Collaborative Research: A Multi-Lab Investigation of the Conceptual Foundations of Early Number Development" Total Costs: ~$31.8M https://www.manynumbers.org/home
Role: **Hubbard** Sub-Award, Amount Pending

Completed (Total Funding: $2,936,645)

PI: **Hubbard**, Co-PI: Matthews September 1, 2016 – August 31, 2021 NIH R01 "Perceptual and Cognitive Mechanisms of Developing Fractions Knowledge: A Cross-Sequential Approach" Total costs: $1,878,053

PI: Starling-Alves, Mentor: **Hubbard** Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) PhD Student Grant (2017-2021): 4 years tuition, fees and stipend (approx. $160,000).

PI: **Hubbard:** September 1, 2019-August 31, 2020 Wisconsin Alumni Research Foundation (WARF) Fall Competition "The Development of Multisensory Integration of Number in Auditory and Visual Modalities" ($47,137)

PI: Matthews, co–PI: **Hubbard** September 1, 2014-August 31, 2018: NSF REAL "Using Nonsymbolic Ratios to Promote Fraction Knowledge: A Neurocognitive Approach". Total costs: $499,998.

PI: Toomarian, Mentor: **Hubbard** NSF Graduate Research Fellowship Program (GRFP) ($120,000.00)

PI: **Hubbard** Wisconsin Alumni Research Foundation (WARF) Fall Competition "Using Multivariate Pattern Analysis to Decode Synesthetic Perception and Memory" ($38,823)

PI: **Hubbard** Wisconsin Alumni Research Foundation (WARF) Fall Competition "Using fMRI to Probe Numerical Representations in the Brain" ($30,474)

PI: **Hubbard** Wisconsin Alumni Research Foundation (WARF): "Educating the Mathematical Brain: The Role of Maturation and Education in the Development of Neural Links between Quantities and Symbols". ($26,033.00)

PI: Samak (Co–PIs, **Hubbard**, Matthews) Wisconsin Alumni Research Foundation (WARF): "CIViz: Development of Compound Interest Visualizations and Testing of Design Principles for Improving Financial Literacy" ($48,154.00)

PI: Samak (Co–PIs, **Hubbard**, Matthews) School of Human Ecology Matching Funds Samak (PI) Matching funds to purchase shared ASL D6000 Desk–mounted eye–tracker for financial literacy visualization tool project. ($12,500.00)

PI: **Hubbard** Fyssen Foundation Post–Doctoral Scholarship (2 years, €44,000, Declined).

PI: **Hubbard** May 2001 – May 2004 NIMH Pre–Doctoral Fellowship "The Neural Basis of Number-Color Synesthesia" 1 F31 MH63585 ($75,473.00)

Conference Organizing Responsibilities

Organizing Board/Committee

Ongoing

2016 – Present: Cognitive Science Society Program Committee Member (CogSci2016; CogSci2017; CogSci2018; CogSci2019; CogSci2020; CogSci 2021; CogSci 2022; CogSci 2023; CogSci 2024) and Student Volunteer Coordinator (CogSci2018, Madison).

2012 – Present: International Conference on Synaesthesia, Art and Science Scientific Program Committee

2011 – Present: American Synesthesia Association Board Member

2002 – Present: American Synesthesia Association Program Committee

Completed

2016 – 2020: Mathematical Cognition Learning Society (MCLS) Governing Board Member: Membership Outreach Coordinator

2014 – 2018: Midwest Mathematical Thinking (M3-T) Annual Meeting Co-Chair.

2014-2016: Secretary/Treasurer: Brain, Neurosciences, and Education SIG, American Education Research Association

Organizing Committee: Mitchell, K., Corvin, A., Graf, I., **Hubbard, E.M.** and Polleux, F. (2011, April). Wiring the Brain: From genetic to neural networks. Dublin, Ireland.

Organizing Committee: de Cordoba, M.–J., Ricco, D., Day, S. and **Hubbard, E.M.** (2009, May). III International Congress on Synaesthesia, Art and Science, Granada, Spain.

Co–host with Randolph Blake (2010, October) 8th Annual Meeting of the American Synesthesia Association. Nashville, TN.

Organizing Committee: Mitchell, K., Corvin, A., Graf, I., **Hubbard, E.M.** and Polleux, F. (2009, May). Wiring the Brain: From genetic to neural networks. Limerick, Ireland.

Scientific Program Committee (2007, April): II International Conference on Art and Synesthesia, Granada Spain

Co–host with V.S. Ramachandran (2002, May). 2nd Annual Meeting of the American Synesthesia Association. San Diego, CA

Symposium Chair

Symposium Chair/Organizer: McMullen, J., **Hubbard, E.M.**, & Matthews, P.G. (2018, April) Organized a series of three linked symposia at the Math Cognition Learning Society Meeting, Oxford, UK

- **Hubbard**, McMullen, & Matthews: Accessing rational numbers – Nature and nurture
- Matthews, **Hubbard** & McMullen: Foundations for fractions – Non-symbolic ratio processes and relational reasoning.
- McMullen, Matthews & **Hubbard**: The development of symbolic fraction knowledge – Processes and proponents

Nano–Symposium co–chair: Bugden, S. & **Hubbard, E.M.** (2017, November): Cognitive Development and Numerical Cognition. Society for Neuroscience, Washington, DC.

Symposium co–chair: **Hubbard, E.M.** & Rosenberg–Lee, M. (2013, April): Contributions of Basic Cognitive Processes to School–Based Mathematics Learning: Uncovering the Neural Pathways. American Education Research Association, San Francisco, CA.

Nano–Symposium co–chair: Rosenberg–Lee, M. & **Hubbard, E.M.** (2012, October): Development of Numerical Cognition. Society for Neuroscience, New Orleans, LA.

Symposium Co–Chair: **Hubbard, E.M** and Troiani, V. (2008, November). The evolution of numerical cognition: From number neurons to linguistic quantifiers. Society for Neuroscience, Washington, D.C.

Symposium Co–Chair: Sagiv, N. & **Hubbard, E.M.** (2002, April). The cognitive neuroscience of synesthesia. Ninth Annual meeting of the Cognitive Neuroscience Society. San Francisco, CA.

Invited Talks

1. University of Michigan (April 16, 2018) "The Ratio Processing System (RPS) as a Foundation for Symbolic Fractions Understanding: A Case Study in Educational Neuroscience"
2. Association for Psychological Science, Invited Symposium "Frontiers in Educational Neuroscience" (May 28, 2016). Understanding Fractions: A Case Study in Educational Neuroscience.
3. Temple Institute for Learning & Education Sciences (April 13, 2016). Understanding Fractions: A Case Study in Educational Neuroscience.
4. 2015 Educational Neuroscience Conference, University of Nebraska-Lincoln (October 16, 2015). Understanding Fractions: A Case Study in Educational Neuroscience.
5. Amsterdam Brain and Cognition (ABC) Summer School on Multisensory Integration and Synesthesia (June 26, 2015). Developing and Decoding Synesthesia
6. Department of Educational Psychology, University of Nebraska-Lincoln (April 10, 2015). Linking Education and Neuroscience: The Foundations of a New Field.
7. Royal Netherlands Academy of Arts and Sciences (March 20, 2015). Decoding the Impact of Synesthesia on Perception, Learning and Memory.
8. Oberlin Synesthesia Symposium, Keynote Lecture, Oberlin College (March 13, 2015). Hearing Colors, Tasting Shapes: Synesthesia as a Window into Human Nature.
9. Communication Arts Colloquium Series, University of Wisconsin–Madison (May 8, 2014). Linking Education and Neuroscience: The Foundations of a New Field.
10. Neuroscience and Public Policy Seminar Series, University of Wisconsin–Madison (April 12, 2014). Linking Education and Neuroscience: The Foundations of a New Field.
11. Waisman Early Childhood Seminar Series, University of Wisconsin–Madison (April 8, 2014). Linking Education and Neuroscience: The Foundations of a New Field.
12. Doctoral Research Program, University of Wisconsin–Madison (October 10, 2013). Linking Education and Neuroscience: The Foundations of a New Field.
13. Cognitive and Systems Neuroscience Laboratory, Stanford University (April 29, 2013). On the Genesis of Exact Number Ideas: How Education Builds Brain Circuits for Exact Number.
14. Department of Psychology, University of Wisconsin–Madison. (April 4, 2013). Integration of quantities, symbols and space in parietal cortex: Implications for education.
15. DELTA Center, University of Iowa (April 6, 2012). Synaesthesia as a window into human nature.
16. Waisman Center, University of Wisconsin–Madison (March 1, 2012). Integration of quantities, symbols and space in parietal cortex: Implications for education.
17. Department of Psychology, Neuroscience and Behaviour, McMaster University (January 6, 2012). Integration of quantities, symbols and space in parietal cortex: Implications for education.
18. Department of Psychology, Neuroscience and Behaviour, McMaster University (January 5, 2012). Synesthesia as a window into human nature.
19. Department of Educational Psychology, University of Wisconsin–Madison (December 14, 2011). Integration of quantities, symbols and space in parietal cortex: Implications for education.
20. Department of Psychology, Birkbeck College, London, England (November 28, 2011). On the Origins of Human–Specific Numerical Abilities.
21. American Synesthesia Association, Keynote Lecture, U.C. San Diego (October 15, 2011). The cross–activation theory at ten: Substantial progress, future challenges.
22. U.K. Synaesthesia Association, Keynote Lecture, University of East London (March 26, 2011). The cross–activation theory at ten: Substantial progress, future challenges.
23. U.K. Synaesthesia Association, Public Lecture, University of East London (March 25, 2011). Synesthesia as a window into human nature.
24. Department of Cognitive Science, Case Western Reserve University, Cleveland, OH (April 17, 2010). Number lines: From synesthesia to education and back.

25. Department of Cognitive Science, Case Western Reserve University, Cleveland, OH (April 16, 2010). Synesthesia as cross–activation between brain maps: A window into human nature.
26. Department of Psychology, Sussex University, Bristol, England (January 28, 2010). How the study of synesthesia sheds light on basic cognitive and perceptual processes.
27. Department of Psychology, University College London, London, England (January 26, 2010). How the study of synesthesia sheds light on basic cognitive and perceptual processes.
28. John B. Pierce laboratory, Yale University (November 3, 2009). How the study of synesthesia sheds light on basic cognitive and perceptual processes.
29. Department of Cognitive Science, Case Western Reserve University, Cleveland, Ohio (May 11, 2009). Cognitive Neuroscience of Mathematical Intuitions. Workshop on "Mathematics as an Emergent Phenomenon".
30. Department of Psychology, University of Bern, Bern, Switzerland (September 18, 2008). Behavioral and neuroimaging investigations of synesthesia.
31. Department of Psychology, University of Milan, Milan, Italy (June 12, 2008). Neural mechanisms underlying mappings between numbers and space.
32. Center for Mind/Brain Sciences, University of Trento, Italy (June 11, 2008). Neural mechanisms of synesthesia.
33. Center for Mind/Brain Sciences, University of Trento, Italy (June 9, 2008). Neural mechanisms underlying mappings between numbers and space.
34. Laboratoire Psychologie de la Perception [Perceptual Psychology Laboratory], Paris, France (May 22, 2008). Neural mechanisms of synesthesia.
35. Stanford Cognitive & Systems Neuroscience Lab, Stanford University School of Medicine (April 18, 2008). Neural mechanisms underlying mappings between numbers and space.
36. Ecole des Hautes Etudes en Sciences Sociales [School for Advanced Studies in Social Sciences], Paris, France (January 29, 2008). Les bases cérébrales de la synesthésie [The cerebral basis of synesthesia]
37. Department of Cognitive Science, Case Western Reserve University, Cleveland, Ohio (January 4, 2008). Neural mechanisms underlying mappings between numbers and space.
38. Maastricht Brain Imaging Center, Maastricht, The Netherlands. (October 5, 2007). Neural mechanisms of synesthesia.
39. Duke University, Center for Cognitive Neuroscience (May 9, 2007). Neural mechanisms subserving the mental number line.
40. Brunel University, Department of Psychology (March 20, 2007). Neural mechanisms subserving the mental number line.
41. University of Cambridge, Centre for Neuroscience in Education (February 27, 2007). Neural mechanisms subserving the mental number line.
42. University College London, Numeracy and Literacy Series. (February 13, 2007). Neural mechanisms subserving the mental number line.
43. European M1 Course in Neuroscience "Neocortex: Computation, Architecture and Development", Ecole Normale Superieur, Lyon. (January 23, 2007) Anatomically Constrained Cross–Activation: A Grand Unified Theory of Synesthesia. Day long course on synesthesia.
44. Hanover Medical School, 2nd International Conference on Synaesthesia (December 1–3, 2006). Individual differences among synaesthetes: Phenomenological, behavioral and neuroimaging measures.
45. University College London, Institute of Cognitive Neuroscience (May 27, 2006). Neurocognitive Mechanisms of Synaesthesia. Part of a workshop on the Cognitive Neuroscience of Synaesthesia.
46. Department of Psychology, University of Ghent, Belgium (February 6, 2006). Individual differences among grapheme–color synaesthetes: Psychophysical and neuroimaging investigations
47. Department of Psychology, Louvain la Neuve, Belgium (November 22, 2005). Des différences individus entre synesthetes : Corrélations entre données comportementale et IRMf [Given in French]

48. L'Institut des Sciences Cognitives, Lyon France (November 10, 2005). Individual differences among grapheme–color synaesthetes: Psychophysical and neuroimaging investigations
49. University of Almeria, Spain (July 25, 2005). Perceptual and neuronal mechanisms of synesthesia. *First International Congress on Synesthesia and Art*.
50. University College London, Department of Psychology (February 22, 2005). Individual differences among grapheme–color synaesthetes: Psychophysical and neuroimaging investigations.
51. University of Texas, Houston Medical Center (September 7, 2004). Psychophysical and neuroimaging investigations of synesthesia.
52. UCLA Brain Mapping Seminar (April 23, 2003). Different forms of synesthesia may arise from cross–activation at different stages of numerical processing.
53. INSERM Unité 562 (March 10, 2003). "Higher" and "lower" forms of synaesthesia arise at different stages of numerical processing.

Recent Conference Presentations (since 2012)

1. **Hubbard, E.M.** (June 2024). Discussant for Neural Insights into Fraction Processing Symposium. Mathematical Cognition and Learning Society, Washington D.C.
2. Park, Y., Kalra, P., Chuang, Y., Binzak, J.V., Matthews, P.G., & **Hubbard, E.M.** (June 2024). Developmental changes in non-symbolic and symbolic fraction processing in primary school children. Talk presented at the Mathematical Cognition and Learning Society, Washington D.C.
3. Ho, H.-R., **Hubbard, E.M.**, & Mutlu, B. (May 2024). "It's not a replacement": Enabling parent-robot collaboration to support in-home learning experiences of young children. In ACM (Association of Computing Machinery) *CHI conference*, May 11-16, 2024, Honolulu, Hawaii, USA.
4. Jay. V., Matthews, P.G., Kaplan, D., Alibali, M. & Hubbard, E.M. (March 2024). Understanding the relationship between fractions and algebra reasoning in younger and older students: a structural equation modeling approach. Poster presented at the Cognitive Development Society (CDS) Meeting, Pasadena, CA.
5. Ho, H.-R., White, N., **Hubbard, E.M.**, & Mutlu, B. (June 2023). Designing parent-child-robot interactions to facilitate in-home parental math talk with young children. In *Interaction Design and Children* (IDC '23), June 19–23, 2023, Chicago, IL, USA. https://doi.org/10.1145/3585088.3589358
6. Schenck, K.E., **Hubbard, E.M.,** Nathan, M., Swart, M. (July 2022). Expanding understandings of embodied mathematical cognition in students' fraction knowledge, *Proceedings of the 44th Annual Meeting of the Cognitive Science Society* 44 (44)
7. Ho, H-R., Cagiltay, B., White, N., **Hubbard, E.M.** & Mutlu, B. (June 2021). RoboMath: Designing a Learning Companion Robot to Support Children's Numerical Skills. In *Interaction Design and Children* (IDC '21) Athens, Greece (virtual). https://doi.org/10.1145/3459990.34607091
8. Viegut, A. A., Park, Y., **Hubbard, E. M.**, Matthews, P. G. (April 2021). Fraction estimation predicts later calculation, but not fluency: A cross-sequential study of primary school children. *Society for Research in Child Development Conference*, (virtual due to COVID).
9. Park, Y., Dean, D., Binzak, J.V., Matthews, P.G., & **Hubbard, E.M.** (Sept 2020). Developmental changes in white matter tracts for symbolic and non-symbolic fractions in primary school children. Paper submitted as part of a symposium at the *Mathematical Cognition and Learning Society* (virtual due to COVID).
10. Chuang, Y.S., **Hubbard, E.M.**, Austerweil, J. (July 2020). The "Fraction Sense" Emerges from a Deep Convolutional Neural Network. *Proceedings of the 42nd Annual Meeting of the Cognitive Science Society* (virtual due to COVID)
11. Park, Y., Dean, D. C., Binzak, J.V., Matthews, P.G. & **Hubbard, E.M.** (May 2020). Symbolic and non-symbolic fractions relate to different white matter tracts: A cross-sectional diffusion MRI tractography study. Poster presented at the Cognitive Neuroscience Society Meeting (virtual due to COVID)

12. Starling Alves, I., Park, Y., Kalra, P.B., Binzak, J.V., Matthews, P.G. & **Hubbard, E.M.** (May 2020). Educational experiences connect symbolic fractions to parietofrontal nonsymbolic ratio processing systems Poster presented at the Cognitive Neuroscience Society Meeting (virtual due to COVID)
13. Matthews, P.G., **Hubbard, E.M.,** Kalra, P.B., Park, Y. (April 2020). The comparative importance of two types of relational reasoning for supporting fractions knowledge. Colloquium talk at the American Education Research Association (AERA), San Francisco, CA http://tinyurl.com/yx2d4jfx (Canceled due to COVID).
14. Kalra, P.B. & **Hubbard, E.M.** (August 2019). An anterior-to-posterior functional connectivity shift in the developing fronto-parietal number network. FLUX Conference, New York, NY.
15. Kalra, P.B., **Hubbard, E.M.**, & Matthews, P.G. (June 2019). Relational reasoning predicts fraction knowledge. Colloquium talk at Mathematical Learning and Cognition Society Meeting, Ottawa, ON, Canada.
16. Starling-Alves, I. & **Hubbard, E. M.** (June 2019). The ratio processing system supports non-symbolic ratio arithmetic. Poster Presented at the 2019 MCLS Conference. Ottawa, ON, Canada
17. Binzak, J.V., Matthews, P.G. & **Hubbard, E.M.** (June 2019). Confidence counts: Relationships between math dispositions and fractions knowledge. Poster Presented at the 2019 MCLS Conference. Ottawa, ON, Canada.
18. Toomarian, E.Y., Park, Y., Matthews, P.G. & **Hubbard, E.M.** (April 2019). Spatial-numerical associations of fractions: Evidence from internal and external representations. Talk presented at American Education Research Association (AERA), Toronto, Canada.
19. Park, Y., Binzak, J.V., Toomarian, E.Y., Kalra, P.B., Matthews, P.G. & **Hubbard, E.M.** (April 2019). Differences in processing symbolic vs. non-symbolic representations of ratios: Behavioral and neural evidence. Talk presented at American Education Research Association (AERA), Toronto, Canada.
20. Kalra, P.B., **Hubbard, E.M.** & Matthews, P.G. (March 2019). Relational reasoning predicts fraction knowledge in elementary school-aged children. Talk presented at Society for Research in Child Development (SRCD), Baltimore, MD.
21. Matthews, P.G., Binzak, J.V., Kalra, P.B., Park, Y. & **Hubbard, E.M.** (March 2019). Perceptual routes to rational number. Talk presented at Society for Research in Child Development (SRCD). Baltimore, MD.
22. **Hubbard, E.M.** (October, 2018). The impact of synesthesia and multisensory stimulation on memory. Talk presented at the Royal Society Discussion Meeting "Bridging Senses: New Developments in Synaesthesia", London, UK.
23. **Hubbard, E.M.** (September 2018). The ratio processing system (RPS) as a foundation for symbolic fractions understanding. Talk presented at the 6th biennial conference of the International Mind, Brain and Education Society (IMBES), Los Angeles, CA.
24. Binzak, J.V., Toomarian, E.Y., Matthews, P.G. & **Hubbard, E.M.** (September 2018). Fractions war: An iOS game to measure and train magnitude processing with fractions. Poster presented at the 6th biennial conference of the International Mind, Brain and Education Society (IMBES), Los Angeles, CA.
25. Gosavi, R. & **Hubbard, E.M.** (September 2018). Better together: Enhanced auditory working memory during multisensory processing. Poster presented at the 6th biennial conference of the International Mind, Brain and Education Society (IMBES), Los Angeles, CA.
26. Jay, V., Binzak, J.V., Mou, Y., Matthews, P.G., **Hubbard, E.M.** & Hyde, D.C. (September 2018). An ERP investigation of the timecourse of symbolic and nonsymbolic fraction processing. Poster presented at the 6th biennial conference of the International Mind, Brain and Education Society (IMBES), Los Angeles, CA.
27. Kalra, P.B., **Hubbard, E.M.** & Matthews, P.G. (September 2018). Relational reasoning predicts fraction knowledge. Poster presented at the 6th biennial conference of the International Mind, Brain and Education Society (IMBES), Los Angeles, CA.

28. Park, Y., Binzak, J.V., Dean III, D.C., Alexander, A.L., Matthews, P.G. & **Hubbard, E.M.** (September 2018). Developmental changes in white matter tracts for symbolic and non-symbolic fractions. Poster presented at the 6th biennial conference of the International Mind, Brain and Education Society (IMBES), Los Angeles, CA.
29. Starling Alves, I. & **Hubbard, E.M.** (September 2018). Evidence for non-symbolic ratio arithmetic in adults and children. Poster presented at the 6th biennial conference of the International Mind, Brain and Education Society (IMBES), Los Angeles, CA.
30. Toomarian, E.Y. & **Hubbard, E.M.** (September 2018). The development of spatial-numerical associations for fractions. Poster presented at the 6th biennial conference of the International Mind, Brain and Education Society (IMBES), Los Angeles, CA.
31. Viegut, A.A., Park, Y., **Hubbard, E.M.** & Matthews, P.G. (September 2018). Differential improvement in fraction estimation in 2nd vs. 5th grade children: Longitudinal analysis. Poster presented at the 6th biennial conference of the International Mind, Brain and Education Society (IMBES), Los Angeles, CA.
32. Park, Y., Binzak, J.V., Toomarian, E.Y., Kalra, P. Matthews, P.G. & **Hubbard, E.M.** (July 2018). Developmental changes in children's processing of nonsymbolic ratio magnitudes: A cross-sectional fMRI study. Poster presented at the 40th Annual Meeting of the Cognitive Science Society, Madison, WI.
33. Binzak, J.V., Toomarian, E.Y., Matthews, P.G., & **Hubbard, E.M.** (July 2018). Fractions War: An iOS game to measure and train magnitude processing with fractions. Poster presented at the 40th Annual Meeting of the Cognitive Science Society, Madison, WI.
34. Meng, R., Matthews, G. & **Hubbard, E.M.** (July 2018). Non-symbolic ratio sense supports symbolic fraction success. Poster presented at the 40th Annual Meeting of the Cognitive Science Society, Madison, WI.
35. Matthews, P.G., Meng. R., Binzak, J.V., Toomarian, E.Y. & **Hubbard, E.M.** (April 2018). Similar behavioral effects for nonsymbolic ratio processing and symbolic fractions suggests common mechanisms. Talk presented at the Math Cognition Learning Society Meeting, Oxford, UK.
36. **Hubbard, E.M.**, Binzak, J.V., Park, Y., Kalra, P. *&* Toomarian. E.Y. (April 2018). The ratio processing system underpins symbolic fraction understanding: Developmental neuroimaging investigations. Talk presented at the Math Cognition Learning Society Meeting, Oxford, UK.
37. Toomarian, E.Y., Gosavi, R.S. & **Hubbard, E.M.** (March 2018). Dissociations between explicit number forms and implicit SNARC effects in number-form synesthetes. Poster presented at the Cognitive Neuroscience Society Meeting, Boston, MA.
38. Kalra, P.B., Binzak, J.V., Park, Y., Toomarian, E.Y., Matthews, P.G. & **Hubbard, E.M.** (March 2018). Individual differences in IPS and PFC function predict fraction knowledge in children. Poster presented at the Cognitive Neuroscience Society Meeting, Boston, MA.
39. Binzak, J.V., Park, Y., Toomarian, E.Y., Kalra, P.B., Chuang, Y.-S., Matthews, P.G. & **Hubbard, E.M.** (March 2018). Neurocognitive relationships between nonsymbolic and symbolic ratio processing in children and adults. Poster presented at the Cognitive Neuroscience Society Meeting, Boston, MA.
40. Gosavi, R.S., Bade, R. & **Hubbard, E.M.** (March 2018). Timbre impacts the consistency of music-color synesthesia. Poster presented at the Cognitive Neuroscience Society Meeting, Boston, MA.
41. Binzak, J.V., Toomarian, E.Y. & **Hubbard, E.M.** (November 2017) The ratio processing system (RPS) as a foundation for symbolic fractions understanding. Talk presented at the Society for Neuroscience, Washington, DC.
42. Gosavi, R.S. & **Hubbard, E.M.** (October 2017). The color of memory: Synesthesia enhances multiple stages of memory. Talk presented at the American Synesthesia Association, Boston, MA.
43. **Hubbard, E. M.**, Binzak, J.V. & Matthews, P. G. (July 2017). Grounding fractions in the RPS: Common distance effects for symbolic fractions and non-symbolic ratios suggest shared processing. Talk presented at the 5th annual Midwest Meeting on Mathematical Thinking, Minneapolis, MN.

44. Toomarian, E.Y., Gosavi, R.S., **Hubbard, E.M.** (July 2017). Investigating the SNARC effect for fractions and whole numbers in number-form synesthetes. Talk presented at the 4th Annual Midwest Meeting for Mathematical Thinking, Minneapolis, MN.

45. Binzak, J.V., Toomarian, E.Y., & **Hubbard, E.M.** (July 2017). Shared neural regions sensitive to magnitude support symbolic and nonsymbolic fractions understanding. Talk presented at the 4th Annual Midwest Meeting of Mathematical Thinking, Minneapolis, MN.

46. Binzak, J.V., Murphy, A.D., **Hubbard, E.M.,** & Rogers, T.T. (July 2017). Beyond magnitude: psychological and neural representations of number properties. Talk presented at the 39th Annual Meeting of the Cognitive Science Society, London, England.

47. Binzak, J.V., Toomarian, E.Y., & **Hubbard, E.M.** (March 2017). Overlapping neural representation of magnitude support understanding nonsymbolic and symbolic fractions. Poster presented at the 2017 Annual meeting of the Cognitive Neuroscience Society, San Francisco, CA.

48. Gosavi, R.S. & **Hubbard, E.M.** (March 2017). A Colorful Advantage in Iconic memory. Poster and talk* presented at the Cognitive Neuroscience Society Meeting, San Francisco. * Poster selected for data blitz.

49. Toomarian, E.Y. & **Hubbard, E.M.** (September 2016). Individual differences in spatial representations of fractions relate to basic math skills but not algebra. Poster presented at International workshop on Domain-General and Domain-Specific Foundation of Numerical and Arithmetic Processing" Tübingen, Germany.

50. **Hubbard, E.M.** (September, 2016). The ratio processing system (RPS) as a foundation for fractions magnitude. In D. Gomez (Chair) MBE Perspectives on the Learning of Fractions and Their Magnitudes. Symposium conducted at the meeting of the International Mind, Brain and Education Society (IMBES), Toronto, ON, Canada.

51. Toomarian, E.Y. & **Hubbard, E.M.** (September, 2016). Individual differences in spatial representations of fractions relate to basic math abilities but not algebra. Poster presented at the International Mind, Brain and Education Society (IMBES), Toronto, ON, Canada.

52. Gosavi, R.S. & **Hubbard, E.M.** (September, 2016). A colorful advantage in iconic memory. Poster presented at the International Mind, Brain and Education Society (IMBES), Toronto, ON, Canada.

53. Matthews, P.G., Meng, R., Toomarian, E.Y. & **Hubbard, E.M.** (August, 2016). The relational SNARC: Spatial representation of nonsymbolic ratios? Paper included in Proceedings of the 38th Annual Conference of the Cognitive Science Society. Philadelphia, PA: Cognitive Science Society.

54. Binzak, J.V. & **Hubbard, E.M.** (July, 2016). Symbolic encoding and magnitude processing during decimals & fractions comparisons. Paper presented at the 4th Annual Midwest Meeting on Mathematical Thinking, Madison, WI.

55. Meng, R., Matthews, P. G., Toomarian, E.Y. & **Hubbard, E.M.** (July, 2016). The relational SNARC: Spatial representation of nonsymbolic ratios? Paper presented at the 4th Annual Midwest Meeting on Mathematical Thinking, Madison, WI.

56. Toomarian, E.Y. & **Hubbard, E.M.** (July, 2016). Individual differences in spatial representations of fractions relate to formal math achievement. Paper presented at the 4th Annual Midwest Meeting on Mathematical Thinking, Madison, WI.

57. Gosavi, R.S., Meyering, E.E., Rose, N.S., Postle, B. R. & **Hubbard, E.M.** (April 2016). Decoding grapheme-color synesthesia using multivariate pattern analysis. Poster and talk* presented at the 2016 Annual meeting of the Cognitive Neuroscience Society, New York, NY. *Graduate Student Award Winner

58. Toomarian, E.Y. & **Hubbard, E.M**. (April 2016). Individual differences in spatial representations of fractions relate to formal math achievement. Poster presented at the 2016 Annual meeting of the Cognitive Neuroscience Society, New York, NY

59. Grulke, Z. & **Hubbard, E.M**. (April 2016). An ALE meta-analysis of facial processing in autism. Poster presented at the 2016 Annual meeting of the Cognitive Neuroscience Society, New York, NY.

60. Toomarian, E.Y., Lewis, M.R., Binzak, J.V. & **Hubbard, E.M.** (October, 2015). Grounding symbolic fractions in the ratio processing system: A developmental fMRI-A study. Society for Neuroscience Meeting. Chicago, IL.
61. Gosavi, R.S., Meyering, E.E., Rose, N., Hubbard, E.M. & Postle, B.R. (October, 2015). Decoding grapheme-color synesthesia using multivariate pattern analysis. Society for Neuroscience Meeting. Chicago, IL
62. Gosavi, R.S., Meyering, E.E., Rose, N., Postle, B.R. & **Hubbard, E.M**. (October, 2015). Decoding grapheme-color synesthesia. American Synesthesia Association, Coral Gables, FL.
63. **Hubbard, E.M.**, Murphy, A.D. & Rogers, T.T. (August, 2015). Beyond magnitude: How math expertise guides number representation. 3rd Annual Midwest Meeting on Mathematical Thinking. Minneapolis, MN.
64. Toomarian, E.Y. & **Hubbard, E.M.** (August, 2015). Fractions on the mental number line: How to reverse the SNARC. 3rd Annual Midwest Meeting on Mathematical Thinking. Minneapolis, MN.
65. Binzak, J.V. & **Hubbard, E.M.** (August, 2015). Accessing rational magnitudes through fractions notation. 3rd Annual Midwest Meeting on Mathematical Thinking. Minneapolis, MN.
66. Murphy, A.D., Rogers, T.T., **Hubbard, E.M.**, Brower, A. (August, 2015). Beyond magnitude: How math expertise guides number representation. Cognitive Science Society Annual Meeting, Pasadena, CA.
67. Lewis, M.R. & **Hubbard, E.M.** (April, 2015). A neurocognitive model of fractions learning. Symposium "Fractions Learning: One Subject, Multiple Perspectives" (Chairs, P.G. Matthews & C.C. Williams) American Education Research Association (AERA), Chicago, IL.
68. Toomarian, E.Y. & **Hubbard, E.M.** (April, 2015). Fractions on the mental number line: How to reverse the SNARC. American Education Research Association (AERA), Chicago, IL.
69. **Hubbard, E.M.** Day, D.T., Tran, C.T., Hathaway, J.C., George, G.C. and Siepmann, C. (April, 2015). The multisensory (AV) representation of number. Cognitive Neuroscience Society Meeting, San Francisco, CA.
70. Lewis, M.R., Toomarian, E.Y. & **Hubbard, E.M.** (April, 2015). Representation of symbolic fractions recruits circuits tuned to nonsymbolic ratio magnitude. Cognitive Neuroscience Society Meeting, San Francisco, CA.
71. Toomarian, E.Y. & **Hubbard, E.M.** (April, 2015). The impact on stimulus-induced processing strategies on symbolic fraction representations. Cognitive Neuroscience Society Meeting, San Francisco, CA.
72. **Hubbard, E.M.**, Mattarella-Micke, A., Viarouge, A. & McCandliss, B.D. (November, 2014) On the genesis of exact number ideas: How education builds brain circuits for exact number. International Mind, Brain and Education Society (IMBES), Dallas, TX.
73. Lewis, M.R., Matthews, P.G. & **Hubbard, E.M.** (July, 2014). The perceptual roots of fraction knowledge: A neurocognitive approach. 2nd Annual Midwest Meeting on Mathematical Thinking. Madison, WI.
74. **Hubbard, E.M.** (July, 2014). The multisensory representation of number. 2nd Annual Midwest Meeting on Mathematical Thinking. Madison, WI.
75. Toomarian, E.Y. & **Hubbard, E.M.** (July, 2014). Stimulus-induced processing strategies impact symbolic fraction representations. 2nd Annual Midwest Meeting on Mathematical Thinking. Madison, WI.
76. Ziols, R., Matthews, P.G., Lewis, M.R., Toomarian, E.Y. & **Hubbard, E.M.** (July, 2014). Refining fraction constructs: An exploratory study of preference and generalization. 2nd Annual Midwest Meeting on Mathematical Thinking. Madison, WI.
77. Lewis, M.R., Matthews, P.G. & **Hubbard, E.M.** (July, 2014). The neurocognitive roots of fraction knowledge. Cognitive Science Society, Quebec City, QB, Canada
78. **Hubbard, E.M.** (May, 2014). Neural mechanisms underlying the building of links between perceptual and symbolic representations of number. NICHD Math Cognition Conference, Washington, DC.
79. Lewis, M.R., Matthews, P.G. & **Hubbard, E.M.** (May, 2014). The "Rational Brain System" and fraction learning. NICHD Math Cognition Conference, Washington, DC.

80. **Hubbard, E.M.** & McCandliss, B.D. (June, 2013). On the genesis of exact number ideas: How education builds brain circuits for exact number. Jean Piaget Society Meeting, Chicago, IL.
81. **Hubbard, E. M.**, Viarouge, A. & McCandliss, B.D. (April, 2013). Developmental changes in approximate number system (ANS) acuity drive the construction of neural systems for number symbols. American Education Research Association, San Francisco, CA.
82. **Hubbard, E. M.** & McCandliss, B.D. (2012, October). Progressive and regressive developmental changes in the IPS for number symbols. Society for Neuroscience, New Orleans, LA.

Teaching Experience

UW–Madison

Instructor

Mind, Brain and Education (EP 326, created; undergrad survey): Spring 2013; Fall 2013; Spring 2014, Fall 2014; Fall 2015; Fall 2018; Fall 2019, Fall 2020 [online due to COVID-19], Fall 2021, Spring 2022, Fall 2023, Spring 2024, Fall 2024

Educational Cognitive Neuroscience (EP 711, created; grad seminar): Spring 2017; Spring 2020, Fall 2023

Developmental Cognitive Neuroscience (EP 925, created; grad seminar): Spring 2013; Spring 2014; Spring 2015; Spring 2016; Spring 2018; Spring 2021

Graduate Seminar in Research in Educational Psychology I (EP 709, grad seminar): Fall 2013; Fall 2014; Fall 2015; Fall 2016; Fall 2017; Fall 2018; Fall 2019; Fall 2020 [online due to COVID-19]

Graduate Seminar in Research in Educational Psychology II (EP 710, grad seminar): Spring 2019

Exploring the Number Sense (EP 506 undergrad/grad seminar, co-created, with Percival Matthews): Fall 2012

The Use and Evaluation of Neuroscience Data in Education (EP 506, created undergrad/grad seminar): Spring 2022

Educational Neuroscience and Creativity (EP 506, created undergrad/grad seminar): Spring 2024, Spring 2025

Recurring Guest Lectures

Undergraduate Neurobiology Seminar course (NTP 500, undergrad seminar): Fall 2014; Spring 2015; Fall 2015; Spring 2016; Fall 2016; Spring 2019; Fall 2019

Functional Brain Imaging of Cognitive Disorders (NTP 675, grad seminar): Fall 2014, Fall 2016; Fall 2018

Introduction to Learning Sciences I for Clinical Students (Ed Psych 795, grad seminar): Fall 2014, Fall 2015, Fall 2016; Fall 2017

Psi Chi Colloquium Series (Undergraduate organized): Fall 2014; Fall 2016; Fall 2018, Spring 2022

UC San Diego

Instructor (as Grad Student)

General Psychology: Cognitive Foundations (lower division): Summer 2003; Summer 2004

Psi Chi Seminar Series (lower division): Fall 2003 to Spring 2004 (three consecutive quarters).

Teaching Assistant (as Grad Student)

Brain Damage and Mental Function (upper division): Fall 2000; Summer 2001; Summer 2002; Fall 2002

Introduction to Neuropsychology (upper division): Summer 2001; Summer 2002

Introduction to Cognitive Psychology (upper division): Winter 2002; Summer 2004

General Psychology: Cognitive Foundations (lower division): Winter 2000; Spring 2004

Introduction to Sensation and Perception (upper division): Summer 2000; Spring 2003

The Logic of Perception (upper division): Fall 2001

Introduction to Statistics (lower division): Winter 2001; Winter 2004

UC Berkeley

Reader (post-BA)

Cognitive Neuroscience (upper division): Fall 1998

Introduction to Mind and Language (upper division): Spring 1999

Service

UW–Madison

University

September 2023 – December 2023: IRB Director Search Committee Member

September 2016 – Present: Education and Social/Behavioral Science Institutional Review Board (IRB) Board Member (Vice Chair 9/2018 – 2021; Chair of the newly formed Minimal Risk Research IRB 2021- Present).

August 2012 – Present: UW-Madison Education and Educational Services (EES) Certificate Program Steering Committee Member (Acting Chair 9/2014-5/2016, Permanent Chair 9/2018 - Present)

October 2018 – January 2019: Ed/SBS Director Search Committee Member

January 2014 – May 2016; September 2017 - 2019: UW-Madison Faculty Senate Representative/Alternate, Department of Educational Psychology.

December 2012 – May 2018: UW-Madison Education and Neuroscience Initiative Committee Member (Cheryl Hanley–Maxwell, Chair)

Departmental

August 2024 - Present: Ed. Psych. Departmental Elections Committee

December 2020 – July 2021; August 2024 - Present: Recruitment, Admissions, Fellowships, & Awards (RAFA)

August 2023 – May 2024: Learning Sciences Faculty Search Committee Member

September 2017 – May 2024: Educational Psychology Faculty/Staff Honors Committee

September 2018 – May 2022: Educational Psychology Colloquium Series Coordinator

June 2019 – January 2020: Quantitative Methods Search Committee Member

September 2015 – February 2018: Center for Healthy Minds/Ed Psych. Search Committee Member (two searches)

August 2012 – January 2013: Faculty Affairs Committee, University of Wisconsin–Madison

Vanderbilt (Post-Doctoral Fellow)

August 2010 – October 2011: Conte Center Science Outreach Advisory Board, Vanderbilt University

UC San Diego (Graduate Student)

August 2002 – June 2003: Admissions Representative, Department of Psychology, University of California, San Diego (elected by graduate students).

August 2001 – June 2002: Graduate Student Representative, Department of Psychology, University of California, San Diego (elected by graduate students).

August 2000 – July 2001: Colloquium Representative, Department of Psychology, University of California, San Diego (elected by graduate students).

Editorial Service

Editorial Board: *Cognition* (January 2007-January 2015), *Frontiers in Cognitive Science* (April 2010-April 2019)

Ad Hoc reviewer: *Nature; Nature Neuroscience; Proceedings of the National Academy of Sciences; Public Library of Science, Biology; Current Biology; Proceedings of the Royal Society of London; Journal of Neuroscience; Trends in Cognitive Sciences; Trends in Neurosciences; Psychological Science; Journal of Cognitive Neuroscience; Human Brain Mapping; Cognitive, Affective and Behavioral Neuroscience; Neuropsychologia; Brain; Cognitive Neuroscience; Journal of Neurophysiology; European Journal of Neuroscience; Journal of Experimental Psychology: General; Journal of Experimental Psychology: Learning, Memory and Cognition; Cognitive Psychology; Perception; Attention, Perception & Psychophysics; Quarterly Journal of Experimental Psychology; Vision Research; Journal of Vision; Consciousness and Cognition; Journal of Experimental Child Psychology; Developmental Psychology; Developmental Science; Developmental Cognitive Neuroscience; Frontiers in Human Neuroscience; Cortex; Journal of Neurological Sciences; Experimental Brain Research; Neurocase; Hormones and Behavior; Journal of Consciousness Studies.*

Book proposal reviewer for *Oxford University Press*

Grant Reviews

Ad hoc external grant reviewer for:
National Science Foundation: Social, Behavioral and Economics (SBE) Directorate Committee of Visitors (2024)
National Science Foundation: Scoping Workshop The Future of Mathematics Learning and Education (2024)
National Science Foundation: Science of Learning (2024)
National Science Foundation: Early Math Panel (2024)
National Science Foundation: Developmental Sciences Program (2023)
National Science Foundation: Cognitive Neuroscience (2022)
National Institutes of Health: NICHD CHHD-H (2020)
National Institutes of Health: Cognition and Perception Study section (2019)
National Institutes of Health: ZRG1 BBBP-T (02) M (2017)
National Science Foundation (Science of Learning-Collaborative Networks 2016, EHR 2017)
National Science Foundation (CAREER Awards 2016, 2017)
National Science Foundation (BCS – Perception, Action and Cognition)
National Institutes of Health: Special Emphasis Panel (SEP) ZRG1 BBBP–T (52) to review grant applications in response to RFA–EY–13–001, Basic Behavioral Research on Multisensory Processing (R21) Member.
Canada NSERC Discovery Grants (Biological Systems and Functions)
European Science Foundation (Consciousness in Natural and Cultural Contexts)
Health Research Board, Ireland; Education and Research Fund at Trinity College
Israel Science Foundation
Agence Nationale de la Récherche (ANR), France
Swiss National Science Foundation
Netherlands Organisation for Scientific Research (NWO) Vidi Program (2014); Vici Program (2015)
Nuffeld Foundation
Leverhulme Trust

Memberships

2016 – Present: Mathematical Cognition Learning Society

2014 – Present: International Mind, Brain and Education Society.

2012 – Present: American Education Research Association (Brain, Neuroscience and Education SIG).

2000 – Present: American Synesthesia Association, Founding Member.

2000 – Present: Society for Neuroscience

2000 – 2003: Vision Sciences Society

1998 – Present: Cognitive Neuroscience Society

Mentoring

UW-Madison

Post-Doctoral Fellows

Priya Kalra (1/2017 – 12/2019) Current position: BrainsCAN Post-doctoral Fellow at Western University
Laura C. Gibson (2/2015 – 1/2016) Current position: Scientific Associate at Toronto Rehab
Mark R. Lewis (5/2013 – 10/2014) Current position: Director of Research and Planning, Normandale Community College

PhD Students Supervised

Yiwen "Roy" Luo (9/2024 – current)
Hui Ru "Irene" Ho (9/2019 – 12/2023, MA) Transferred to Computer Science PhD Program
Katherine Norman (9/2018 – 12/2023, PhD) Currently Post-Doctoral Fellow with Peter Wardrip, UW-Madison.
Yun-Shiuan "Sean" Chuang (9/2019 – 05/2021; Psychology co-advised with Joe Austerweil)
Isabella Starling-Alves (9/2017 – 8/2021, PhD) Currently: Post-Doctoral Fellow, Vanderbilt University
John Binzak (9/2014 – 8/2020, PhD) Currently: AimsWEB Research Director at Pearson
Radhika Gosavi (9/2014 – 5/2019, PhD) Currently: Assistant Director Stanford-Synapse Brainwave Learning Center
Zachary Grulke (9/2014 – 5/2019, MA) Currently: Left program after Master's
Elizabeth Y. Toomarian (9/2013 – 9/2018, PhD) Currently: Director Stanford-Synapse School Brainwave Learning Center

PhD Rotation Students Supervised

Marisa Ross (Neuroscience and Public Policy PhD Program, 12/2016 – 3/2017)
Andrew Merluzzi (Neuroscience and Public Policy PhD Program, 11/2014 – 1/2015)
Caitlin Murphy (Neurophysiology PhD Program, 10/2014 – 12/2014)
Leigh Ann Leabo (Rehab. Psych. Masters Student; 1/2014 – 5/2014)

Thesis Committee Chair (All UW-Madison, Educational Psychology)

Elizabeth Y. Toomarian
- Master's Thesis Proposal: May 8, 2015
- Master's Defense: March 10, 2016
- Preliminary Examination: Sept. 8, 2016
- Dissertation Proposal: Oct. 27, 2017
- Dissertation Defense: Aug. 27, 2018

Radhika S. Gosavi
- Master's Thesis Proposal: June 7, 2016
- Master's Defense: May 4, 2017
- Preliminary Examination: Dec. 12, 2017
- Dissertation Proposal: Aug. 2, 2018
- Dissertation Defense: May 13, 2019

John V. Binzak
- Master's Thesis Proposal: Aug 31, 2016
- Master's Thesis Defense: Dec. 9, 2016
- Preliminary Examination: Dec. 14, 2017
- Dissertation Proposal: Aug. 31, 2018
- Dissertation Defense: July 23, 2020

Zachary Grulke
- Master's Thesis Proposal: Feb. 16, 2017
- Master's Thesis Proposal: Oct. 4, 2018
- Master's Defense: April 16, 2019

Isabella Starling-Alves
- Prior Master's Thesis Accepted: Oct. 16, 2017
- Preliminary Examination: Nov. 8, 2019
- Dissertation Proposal: July 13, 2020
- Dissertation Defense: Aug. 17, 2021

Katherine Norman
- Master's Thesis Proposal: Feb. 21, 2020
- Master's Thesis Defense: Dec. 9, 2020
- Preliminary Examination: May 10, 2021
- Dissertation Proposal: Jan. 12, 2022
- Dissertation Defense: Dec. 7, 2023

Hui Ru "Irene" Ho
- Master's Thesis Proposal: June 13, 2022
- Master's Thesis Defense: Dec. 4, 2023

Thesis Committee Member (UW-Madison, unless otherwise noted)

Ariel Fogel, Educational Psychology
MAP Defense: August 5, 2022

Shuqi Wang, Curriculum & Instruction
Masters Defense: April 29, 2022

Robert Quintana
Master's Proposal: Dec. 15, 2021
Master's Defense: April 25, 2023
Preliminary Examination: May 22, 2024

Xiangyun Tang, Educational Psychology
Preliminary Examination: April 30, 2021

Pauline Ho, Educational Psychology
Preliminary Examination: April 8, 2021

Yun-Shuuan "Sean" Chuang, Psychology
First Year Project Defense: April 19, 2021

Melina Knabe, Educational Psychology
Preliminary Examination: March 1, 2021

Clint Jensen, Psychology
Prelim Proposal: June 19, 2020
Prelim Defense: Aug. 19, 2020

Leroy Williams, Educational Psychology
Dissertation Proposal: May 15, 2020
Dissertation Defense: June 23, 2021

Kelly Gregus, Educational Psychology
Dissertation Proposal: May 13, 2020

Kelsey Schenck, Educational Psychology
Major Area Paper: July 24, 2019
Preliminary Examination: Nov. 23, 2020
Dissertation Proposal: April 4, 2022

Aygul Hoffman, Educational Psychology
Preliminary Examination: May 23, 2019

Alli Foy, Educational Psychology
Dissertation Proposal: May 7, 2019
Dissertation Defense: May 10, 2021

Melissa Schoenlein, Psychology
First Year Project Defense: April 2, 2019

Alexandria Viegut, Educational Psychology
Master's Proposal: Dec. 14, 2018
Master's Defense: Dec. 16, 2019
Preliminary Examination: July 16, 2020
Dissertation Proposal: Dec. 7, 2020
Dissertation Defense: June 24, 2022

Katherine Norman, Interdisciplinary Theater Studies
Master's Thesis Defense: April 24, 2018

Catherine Bredemann, Educational Psychology
Preliminary Examination: May 10, 2018
Dissertation Proposal: January 17, 2019
Dissertation Defense: June 4, 2020

Maame Adomako, Educational Psychology
Preliminary Examination: Jan. 18. 2018

Svetllana Rudenko (Universidad de Granada, Spain)
External Reviewer, PhD Dissertation: Dec. 4, 2017

Isabella Starling-Alves (Universidad Minas Gerais, Brazil)
External Reviewer, Master's Thesis: March 10, 2017 *Also accepted for UW-Madison, Chair

Rui Meng, Educational Psychology
Master's Thesis Proposal: Nov. 1, 2017
Master's Thesis Defense: June 14, 2018

Yunji Park, Educational Psychology
Master's Thesis Proposal: Dec. 13, 2017
Master's Defense: May 7, 2019
Dissertation Proposal: March 24, 2020
Dissertation Defense: March 29, 2021

Ron Hopkins, Educational Psychology
Master's Thesis Proposal: March 6, 2017

Felice Resnick, Educational Psychology
Preliminary Examination: Oct. 21, 2016

Wesley Collier, Educational Psychology
Major Area Paper: Spring 2016

April D. Murphy, Psychology
Master's Thesis Proposal: April 14, 2015
Master's Defense: June 9, 2015
Dissertation Proposal; April 15, 2016
Dissertation Defense: June 5, 2018

Matthew J. Hirshberg, Educational Psychology
Preliminary Examination: May 14, 2015

Undergraduate Research Assistants

Over 200 undergraduates mentored at UW-Madison.
Many have engaged in additional writing-intensive projects, see notes after each student name and dates

* = Completed Bio 152 Project
§ = Undergraduate Research Scholar
† = Awarded Welton/Hilldale Fellowship
H = Senior Honors Thesis
C = Capstone Thesis
T = Trewartha Senior Thesis Award

Krithi Gopinath (9/2024 – Present)
Jack Christensen (1/2024 – Present HS)
Olivia Imberger (1/2024 – Present) *
Julia Shippey (1/2024 – Present) *
Andrew Gumieny (9/2023 – Present)
Abby Micksch (9/2023 – Present)
Max Komisar (1/2023 – Present) H
Sophie Schaubel (1/2023 – Present) *
Ella Schroeder (1/2023 – Present)
Maanya Shetty (1/2023 – Present) *
Aarna Shah (1/2023 – Present) *
Clara Merkel (1/2023 – 12/2023)
Sophie Reeves (9/2022 – 12/2023)
Audrey Burke (9/2022 – 5/2023)
Abigail Young (1/2022 – 5/2024) *
Maggie Siepmann (1/2022 – 12/2023)
Zach Sayner (1/2022 – 12/2023) *
Grace Pausma (1/2022 – 5/2023) *
Andreea Turcu (1/2022 – 5/2023)
Abby Andrews (1/2022 – 8/2022)
Thomas Fung (1/2022 – 12/2022)
Kennedy Mayer (9/2021 – 5/2024) *
Josie Polack (9/2021 – 5/2024) *
Eva Bacskai (1/2021 – 12/2022) *
Abdi Jama (1/2021 – 5/2022)
Delanie Rybacki (1/2021 – 5/2021)
Jack Siepmann (9/2020 – 12/2022)
Elijah Karian (9/2020 – 5/2022)
Livvy Clauss (9/2020 – 5/2022)
Connor Eull (9/2020 – 12/2021)
Chasee Boyd (9/2020 – 5/2021)
Alexandra Carlson (9/2020 – 5/2021)
Emma Gran (9/2020 – 5/2021)
Nina Ignatowski (9/2020 – 5/2021)
Anna Nguyen (9/2020 – 5/2021)
Maya Zent (9/2020 – 5/2021)
Chanel Sims (9/2020 – 12/2020)
Hannah Sugrue (9/2020 – 12/2020)
Matthew Eliason (1/2020 – 5/2022) *
Molly Pistono (1/2020 – 5/2022) *
Valerie Buroker (1/2020 – 5/2022) *
Madison Rinehart (1/2020 – 12/2021)
Michelle Shterenfeld (1/2020 – 5/2021)
Peyton Nystrom (1/2020 – 12/2021)
Callahan Manuel (1/2020 – 5/2021)
Jake Lundquist (1/2020 – 5/2021)
Laura Parnell (1/2020 – 5/2020)
Sanjana Kumar (9/2019 – 5/2022) H
Samantha Weinfurter (9/2019 – 5/2021) *
Karen Hayes (9/2019 – 5/2021) *
Haley Annes (9/2019 – 5/2020) *
Aidan Nordquist (9/2019 – 12/2020)
Michael Bartley (9/2019 – 12/2020)
Allison Dorn (9/2019 – 5/2020)
Yesica Hernandez (9/2019 – 5/2020)
Lane Kohl (9/2019 – 5/2020)
Spencer Sweeney (6/2019-8/2019, Lawrence Univ.)
Adileen Sii (1/2019 – 5/2021) *
Jillian Aschenbrener (1/2019 – 5/2019) *
Halle Tyczkowski (1/2019 – 12/2019) *
Abigail Laumer (1/2019 – 5/2021) *
Jamila M. Ougayour (1/2019 – 5/2020) *
Naman M. Patel (1/2019 – 12/2019) *
Elizabeth Nachman (1/2019 – 5/2020)
Hannah Smith (1/2019 – 12/2019)
Olivia Haessly (1/2019 – 5/2020)
Riley Knueppel (1/2019 – 5/2020)
Megan Loh (1/2019 – 5/2020)
Elizabeth Huang (1/2019 – 5/2019)
Julia Miller (1/2019 – 12/2019)
Kai Pham (1/2019 – 12/2019)
Hui Ru "Irene" Ho (9/2018 – 5/2019, NTU started as PhD student, Fall 2019)
Thomas Heidinger (9/2018 – 5/2021) * H
Morgan Daley (9/2018 – 5/2019)
Sarah Skinner (9/2018 – 5/2019) *
Alissa Woodman (9/2018 – 5/2020)
Michiel Smit (6/2018 – 12/2018) C
Matthew Wronski (6/2018-9/2018, and 6/2019 – 8/2019, Lawrence Univ.)
Karley Adams (1/2018 – 12/2019) *
Heather Moutvic (1/2018 – 12/2019) *
Maya Peterson (1/2018 – 12/2019) *
Angela Schmidt (1/2018 – 12/2019) *
Taylor Binversie (1/2018 – 5/2019)

Brianna Bushman (1/2018 – 12/2018)
Subin Chung (1/2018 – 12/2018)
Brenna Ellis (1/2018 – 5/2019)
Elizabeth Helin (1/2018 – 12/2018)
Elizabeth Kaiser (1/2018 – 5/2018)
Brittany LaFerriere (1/2018 – 5/2019)
Stephanie Meder (1/2018 – 5/2018)
Taylor Olson (1/2018 – 12/2018)
Maryann Rehani (1/2018 – 5/2019) *
Katie Sarino (1/2018 – 5/2019) H
Michael Scheibengraber (1/2018 – 12/2018)
Megan Schwickert (1/2018 – 5/2018)
Evan Decker (9/2017 – 5/2020) *
Anna Ferrigan (9/2017 – 12/2019) *
Alison Fieldbinder (9/2017 – 5/2019) §
Ethan Kirshenbaum (9/2017 – 5/2019)
Jason Proctor (9/2017 – 5/2019)
Johanna Ellefson (9/2017 – 12/2018) §
Gabriella Pincon (9/2017 – 12/2018) § *
Amy Carpenter (9/2017 – 5/2018)
Yun Schiuan "Sean" Chuang (9/2017 – 5/2018; NTU, started as PhD student Fall 2019)
Emily Murwin (Summer, 2017 Lawrence Univ.)
Erin Plummer (6/2017 – 5/2019) *
Lea Wheeler (1/2017 – 5/2018)
Alexis Aschkenase (1/2017 – 5/2018) *
Doha Awad (1/2017 – 5/2019) *
Tarang Gondaliya (9/2016 – 12/2017)
Liz Bennet (9/2016 – 5/2018)
Allie Palmer (9/2016 – 12/2017)
Mia Prifti (9/2016 – 5/2018)
Valerie Swiecichowski (9/2016 – 12/2018) *
Nick Thomas (9/2016 – 5/2018) *
Ian Cogswell (9/2016 – 12/2017) *
Abbie Scheidt (9/2016 – 12/2018) *
Kim Soderberg (9/2016 – 12/2017)
Monica Janz (9/2016 – 5/2019) T, H
Aryanna Klemme (9/2016 – 12/2017)
Krystal Almazan (9/2016 – 9/2017)
Olivia Rotelle (9/2016 – 9/2017)
Meg Wiley (9/2016 – 9/2017)
Liz Ehrendreich (9/2016 – 5/2017)
Ellie Poikonen (9/2016 – 5/2017)
Morgan Gald (9/2016 – 5/2017) *
Jeremy Portillo (9/2016 – 12/2016) §
Heidi Wager (9/2016 – 12/2016)
Miranda Manzanares (9/2016 – 12/2016)
Samantha Crowley (6/2016 – 5/2018) *
David Chen (6/2016 – 5/2020 HS and UG)
Eliza Godfrey (6/2016 – 5/2019) † H
Christina Brahos (6/2016 – 5/2017)
Kelly Truong (6/2016 – 5/2017)
Girija Biyani (6/2016 – 5/2017)
Siddesh Zadey (6/2016 – 12/2016, Pune Univ.)
Anna Kim (Summer 2016, Lawrence Univ.)
Morgan Widhalm (Summer 2016, Notre Dame)
Samuel Park (1/2016 – 5/2017) *
Nina Vakil (9/2015 – 12/2018) §
Tori Jay (9/2015 – 5/2017)
Kimberly Crow (9/2015 – 5/2017) § *
Gabriel Valdes (9/2015 – 12/2016)
Rory Bade (9/2015 – 12/2016)
Rylan Benson (9/2015 – 5/2016)
Alex Coakley (9/2015 – 5/2016)
Hans Hermann (9/2015 – 5/2016)
Maiyer Vang (9/2015 – 5/2016) §
Kymberly Sickle (9/2015 – 5/2016)
Cara Lee (9/2015 – 5/2016)
Carolyn Heal (9/2015 – 5/2016)
Anjali Thakrar (9/2015 – 5/2016)
Brody Fitzpatrick (1/2015 – 5/2016) *
Ellie Port (1/2015 – 5/2016)
Madeline Krahn (1/2015 – 5/2016)
Becky Liu (9/2014 – 12/2016) * †
Evan Smith (9/2014 – 5/2017) *
McKenna Splett (Summer 2014) †
Austin Petermann (6/2014 – 5/2015)
Cooper Siepmann (1/2014 – 5/2016) *
Isabella Starling-Alves (1/2014 – 12/2014, Minas Gerais; returned as PhD student)
Grace George (9/2014 – 5/2017) § * †
Rob Shaver (9/2014 – 5/2015)
Taylor Shiff (9/2014 – 5/2015) §
Dakota Pawlak (9/2013 – 5/2016)
Aaron Meusch (9/2013 – 5/2017) *
Xao Yang (9/2013 – 5/2014)
Brittany Seidl (9/2013 – 5/2014)
Jennifer Hathaway (9/2013 – 5/2016) § * †
Abigail Zellner (9/2012 – 5/2016) * †
Danielle Day (9/2012 – 5/2015) * †
Christina Tran (9/2012 – 5/2014)

Vanderbilt

Arnaud Viarouge (Post-Doc with Bruce McCandliss: 2009 – 2012) Current position: Associate Professor of Developmental Psychology, Paris Descartes University

INSERM

Arnaud Viarouge (PhD student with Stanislas Dehaene: 2005 – 2008) Current position: Associate Professor of Developmental Psychology, Paris Descartes University

Mariagrazia Ranzini (Master's student with Stanislas Dehaene: 2005 – 2007) Current position: Department of General Psychology, University of Padova, Italy

Ilaria Berteletti (PhD student with Marco Zorzi: 2005 – 2009) Current position: Assistant Professor in Educational Neuroscience, Galludet University

UC San Diego

Approximately 20 undergraduates and one high-school student mentored (1999-2004).