Elizabeth S. Norton, Ph.D.

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CURRENT APPOINTMENTS

Northwestern University, Evanston, IL 2015-present
***Jane Steiner Hoffman and Michael Hoffman* Assistant Professor,**
Department of Communication Sciences & Disorders, School of Communication;
Department of Medical Social Sciences, Feinberg School of Medicine, by courtesy
Principal Investigator, Language, Education and Reading Neuroscience (LEARN) Lab, http://learnlab.northwestern.edu
Co-Director, Neurodevelopmental Core, Northwestern Institute for Innovations in Developmental Sciences (DevSci) http://devsci.northwestern.edu

Massachusetts Institute of Technology, Cambridge MA 2015-present
Research Affiliate, McGovern Institute for Brain Research

EDUCATION and TRAINING

Post-Doctoral Fellowship, MIT, Cambridge MA 2012–2015
McGovern Institute for Brain Research/Department of Brain & Cognitive Sciences
PI: John Gabrieli
Research areas: Neural correlates and biomarkers of reading, dyslexia and autism; MRI and ERP methods for developmental research; rapid automatized naming (RAN)

Ph.D., Tufts University, Medford MA 2006–2012
Eliot-Pearson Department of Child Study and Human Development
Advisor: Maryanne Wolf
Dissertation: Using Cognitive Neuroscience to Predict Dyslexia in Kindergarten Children: Toward MRI and EEG Predictors of Reading Disabilities

A.B., with high honors, Dartmouth College, Hanover NH 2001–2005
Language and Brain Development (self-designed major)
Advisor: Laura-Ann Petitto
Honors thesis: The Spelling Brain: An fMRI Study of Cognitive Processes in Spelling

RESEARCH GRANTS

Current Grants as PI

NIH – NIDCD R21 DC017210 2018-2020
Parent-toddler EEG neural synchrony as a window into social communication deficits in autism.
Total direct costs: $275,000

NIH – NIDCD R01 DC016273 (MPIs Norton & L. Wakschlag) 2018-2023
The When to Worry about Language Study (W2W-L): Joint consideration of developmental patterning and neurodevelopmental context for enhancing early identification of language impairment.
Total direct costs: $2,498,151
-Diversity supplement to R01 DC016273 to support research coordinator 2018-2019
Total direct costs: $52,000
-COVID-19 supplement to study the effect of COVID on participants, 2020-2021
Direct costs: $124,737

Northwestern Memorial Foundation Dixon Translational Research New Investigator Award (PI Norton), *Neural biomarkers of language in preterm infants.* 2018-2020
Direct costs: $34,851

Current Grants as Co-I or Consultant

NIH – NIMH R01 MH121877 (PI L. Wakschlag) 2020-2025
Optimizing Prediction of Preschool Psychopathology From Brain: Behavior Markers Of Emotion Dysregulation From Birth: A Computational, Developmental Cognitive Neuroscience Approach

NIH – NIDA R34 DA050266 (PI L. Wakschlag) 2019-2021
Optimizing access, engagement and assessment to elucidate prenatal influences on neurodevelopment: The Brains Begin Before Birth (B4) Midwest Consortium.
Role: Co-Investigator

NIH – NICHD R03 HD096098 (PI T. Perrachione, Boston University) 2018-2020
Cortical development and neuroanatomical anomalies in developmental dyslexia.
Role: Consultant

NIH – NICHD R01 HD083310 (PI S. Waxman) 2017-2020
Linking language and cognition in infancy: Entry points and developmental change.
(Competing revision to R01 – adding EEG/ERP to existing paradigm)
Role: Co-Investigator

AHA Strategically-Focused Research Network Grant (PI B. Marino) 2017-2020
Cardiovascular health in children – Healthier, earlier.
Role: Co-Investigator and Mentor

NIH – NIMH R01 MH107652 (PI L. Wakschlag) 2016-2021
Generating an earlier science of when to worry: A neurodevelopmental, transactional approach to characterizing irritability patterns beginning in infancy.
Role: Co-investigator

Completed Grants and Fellowships

NIH – NIMH U01 MH082830 (PI L. Wakschlag) 2016-2019
Dimensions of early temper loss & low concern: Clinical utility & mechanisms.
Role: Co-investigator

Delaney Fund for Research and Communication Grant 2017-2019
'Beginning with Babble' to improve language development and communication health in low-SES toddlers and their parents: a randomized control pilot intervention study.
Role: PI Direct costs: $46,304

Alumnae of Northwestern University Grant, *Predicting children's response to intensive summer language intervention* 2016
Role: PI Direct costs: $4,081

Simons Center for the Social Brain, Schwinn Family Postdoctoral Fellowship, MIT 2013–2015
Role: Fellow, 2 years salary + $10,000 research expenses

National Science Foundation Graduate Research Fellowship 2007–2010
Role: Fellow, 3 years stipend + tuition + $10,000 research expenses

Evans Literacy Fellowship, Tufts University 2006–2007
Role: Fellow, 1 year stipend + tuition

Filene Fellowship in Psychological & Brain Sciences, Dartmouth College 2004–2005
Role: Fellow, $4,000 stipend

Hodgson Grant for Cognitive Neuroscience Research, Dartmouth College 2004
Role: Fellow, $2,000 research grant

Waterhouse Research Grant, Dartmouth College 2003
Role: Fellow, $1,500 research grant

Rothenburg Grant, Dartmouth College 2002
Role: Fellow, $1,000 research grant

PUBLICATIONS

Published Peer-Reviewed Manuscripts (**^***Student mentee author*)

25. **^**Manning, B. L., **^**Harpole, A., **^**Harriott, E., **^**Postolowicz, K., & **Norton, E. S.** (accepted). Taking language samples home: Feasibility, reliability and validity of child language samples conducted remotely with video chat versus in-person. *Journal of Speech, Language, and Hearing Research.* Preprint: https://doi.org/10.31234/osf.io/23u8a

24. **^**McWeeny, S., & **Norton, E. S.** (2020). Understanding event related potentials (ERPs) in clinical and basic and language and communication disorders research: a tutorial. *International Journal of Language and Communication Disorders, 55*(4), 445-457. https://doi.org/10.1111/1460-6984.12535

23. Zuk, J., Dunstan, J., **Norton, E. S.**, Yu, X., Ozernov-Palchik, O., Wang, Y., Hogan, T., Gabrieli, J., & Gaab, N. (2020). Multifactorial pathways facilitate resilience among kindergarteners at risk for dyslexia: A longitudinal behavioral and neuroimaging study. *Developmental Science.* https://doi.org/10.1111/desc.12983

22. Yu, X., Zuk, J., Purdue, M. V., Ozernov-Palchik, O., Raney, T., Beach, S., **Norton, E. S.**, Ou, Y., Gabrieli, J., & Gaab, N. (2020). Putative protective neural mechanisms in pre-readers with a family history of dyslexia who subsequently develop typical reading skills. *Human Brain Mapping*, *41*(10), 2827-2845. https://doi.org/10.1002/hbm.24980

21. **^**Manning, B. L., Roberts, M. Y., Estabrook, R., Petitclerc, A., Burns, J., Briggs-Gowan, M., Wakschlag, L. S., & **Norton, E. S.** (2019). Relations between toddler expressive language and temper tantrums in a community sample. *Journal of Applied Developmental Psychology*, *65*, 101070. https://doi.org/10.1016/j.appdev.2019.101070

20. Luby, J., Allen, N., Estabrook, R., Pine, D., Rogers, C., Krogh-Jespersen, S., **Norton, E. S.**, & Wakschlag, L. (2019). Mapping infant neurodevelopmental precursors to mental disorder: Enhancing prediction of early childhood psychopathology via synthetic cohort & computational approaches. *Behavior Research and Therapy*, *123*, 103484. https://doi.org/10.1016/j.brat.2019.103484

19. Nayar, K., McKinney, W., Hogan, A., Martin, G., La Valle, C., Sharp, K., Berry-Kravis, E., **Norton, E. S.,** Gordon, P., & Losh, M. (2019). Language processing skills linked to FMR1 variation: A study of gaze-

language coordination during rapid automatized naming among women with the FMR1 premutation. *PLoS One, 14*(7), e0219924. https://doi.org/10.1371/journal.pone.0219924

18. Centanni, T. M.*, **Norton, E. S.*,** Park, A., Beach, S. D., Halverson, K., Gaab, N., & Gabrieli, J. D. (2019). Disrupted left fusiform response to print in kindergartners is associated with subsequent reading impairment. *NeuroImage: Clinical, 22,* 101715. https://doi.org/10.1016/j.nicl.2019.101715 *(*Co-first authors).*

17. Wakschlag, L. S., Roberts, M. Y., **Norton, E. S.,** Marino, B. S., Losh, M., Mittal, V., Allen, B., Ferrie, J., Flynn, R., & Davis, M. (2019). Future directions for earlier identification and prevention of mental health problems: Aligning developmental clinical and population science towards a healthier, earlier roadmap. *Journal of Clinical Child and Adolescent Psychology, 48*(3), 539-554. https://doi.org/10.1080/15374416.2018.1561296

16. Ozernov-Palchik, O., **Norton, E. S.**, Wang, Y., Beach, S. D., Zuk, J., Wolf, M., Gabrieli, J. D. E., & Gaab, N. (2019). The relationship between socioeconomic status and white matter structure in pre-reading children: A longitudinal investigation. *Human Brain Mapping*, *40*, 741–754. https://doi.org/10.1002/hbm.24407

15. Deveney, C. M., Briggs-Gowan, M. J., Pagliaccio, D., Estabrook, C. R., Zobel, E., Burns, J. L., **Norton, E. S.,** Pine, D. S., Brotman, M. A., Leibenluft, E., & Wakschlag, L. S. (2019). Temporally sensitive neural measures of inhibition in preschool children with varying irritability symptoms. *Developmental Psychobiology, 61,* 216–227. https://doi.org/10.1002/dev.21792

14. Roberts, M. Y., Curtis, P., Estabrook, R., **Norton, E. S.**, Davis, M., Burns, J., Briggs-Gowan, M., Petitclerc, A., & Wakschlag, L. S. (2018). Talking tots and the terrible twos: Generating a developmental understanding of the relationships between early language and disruptive behavior in toddlers. *Journal of Developmental & Behavioral Pediatrics, 39*(9), 709-714. https://doi.org/10.1097/DBP.0000000000000615

13. Nayar, K., Gordon, P., Martin, G., Hogan-Brown, A., La Valle, C., McKinney, W., Lee, M., **Norton, E. S.,** & Losh, M. (2018). Links between looking and speaking in autism and first-degree relatives: Insights into the expression of genetic liability to autism. *Molecular Autism*, *9*, 51. https://doi.org/10.1186/s13229-018-0233-5

12. Centanni, T. M.*, **Norton, E. S.*,** Park, A., Beach, S., Halverson, K., Gaab, N., & Gabrieli, J. D. E. (2018). Letter selectivity in fusiform gyrus predicts letter knowledge and word reading in kindergarten children. *Developmental Science,* e2658. https://doi.org/10.1111/desc.12658 *(*Co-first authors)*

11. Ozernov-Palchik, O., **Norton, E. S.,** Sideridis, G., Beach, S. D., Gabrieli, J. D. E., & Gaab, N. (2017). Early-reading profiles of children at kindergarten and longitudinally: Implications for early screening and theories of reading. *Developmental Science, 20*(5). https://doi.org/10.1111/desc.12471

10. Saygin, Z. M., Osher, D., **Norton, E. S.,** Youssoufian, D., Beach, S. D., Feather, J., Gaab, N., Gabrieli, J. D. E., & Kanwisher, N. (2016). Connectivity precedes function in the development of the visual word form area. *Nature Neuroscience, 19*, 1250–1255. https://doi.org/10.1038/nn.4354

9. Vandermosten, M., Hoeft, F., & **Norton, E. S.**† (2016). Integrating MRI brain imaging studies of pre-reading children with current theories of developmental dyslexia: A review and quantitative meta-analysis. *Current Opinion in Behavioral Science, 10,* 155-161. (†*Senior/corresponding author*) https://doi.org/10.1016/j.cobeha.2016.06.007

8. **Norton, E. S.,** Beach, S. D., & Gabrieli, J. D. E. (2015). Neurobiology of dyslexia. *Current Opinion in Neurobiology, 30,* 73-78. https://doi.org/10.1016/j.conb.2014.09.007

7. **Norton, E. S.,** Black, J. M., Stanley, L. M., Tanaka, H., Gabrieli, J. D. E., Sawyer, C., & Hoeft, F. (2014). Functional neuroanatomical evidence for the double-deficit hypothesis of developmental dyslexia. *Neuropsychologia, 61*, 235-246. https://doi.org/10.1016/j.neuropsychologia.2014.06.015

6. Saygin, Z. M.*, **Norton, E. S.*,** Osher, D., Beach, S. D., Cyr, A. B., Ozernov-Palchik, O., Yendiki, A., Fischl, B., Gaab, N., & Gabrieli, J. D. E. (2013). Tracking the roots of reading ability: White matter volume and integrity correlate with phonological awareness in pre- and early-reading kindergarten children. *The Journal of Neuroscience, 33*(33), 13251-13258. *(*Co-first authors)*

https://doi.org/10.1523/jneurosci.4383-12.2013

5. **Norton, E. S.,** & Wolf, M. (2012). Rapid automatized naming (RAN) and reading fluency: Implications for understanding and treatment of reading disabilities. *Annual Review of Psychology, 63,* 427-452. http://doi.org/10.1146/annurev-psych-120710-100431
4. Gabrieli, J. D. E. & **Norton, E. S.** (2012). Reading abilities: Importance of visual-spatial attention. *Current Biology, 22*(9), 298-299. https://doi.org/10.1016/j.cub.2012.03.041
3. Kovelman, I., **Norton, E. S.,** Gaab, N., Christodoulou, J., Triantafyllou, C., Lieberman, D. A., Lymberis, J., Wolf, M., Whitfield-Gabrieli, S., & Gabrieli, J. D. E. (2011). Brain basis of phonological awareness for spoken language in children and its disruption in dyslexia. *Cerebral Cortex*, *22*(4), 754-764. https://doi.org/10.1093/cercor/bhr094
2. Wolf, M., Barzillai, M., Gottwald, S., Miller, L., Spencer, K., **Norton, E**., Lovett, M., & Morris, R. (2009). The RAVE-O intervention: Connecting neuroscience to the classroom. *Mind, Brain, and Education, 3*(2), 84-93. https://doi.org/10.1111/j.1751-228X.2009.01058.x
1. **Norton, E. S.,** Kovelman, I., & Petitto, L. A. (2007). Are there separate neural systems for spelling? New insights into the role of rules and memory in spelling from fMRI. *Mind, Brain, and Education, 1*(1), 48-59. https://doi.org/10.1111/j.1751-228X.2007.00005.x

Published Chapters

3. **Norton, E. S.** (2019). Bringing together multiple methods and measurements to improve our understanding of dyslexia. In J. Washington, D. Compton, & P. McCardle (Eds.), *Dyslexia 101: Revisiting Etiology, Diagnosis, Treatment, and Policy*. Baltimore, MD: Brookes.
2. **Norton, E. S.,** Gabrieli, J. D. E., & Gaab, N. (2019). Neural predictors of dyslexia. In L. Verhoeven, C. Perfetti & K. Pugh (Eds.), *Developmental dyslexia across languages and writing systems: A handbook* (pp. 253-276). Cambridge, UK: Cambridge University Press.
1. Wolf, M., Gottwald, S., Galante, W., **Norton, E**., & Miller, L. (2009). How the origins of reading inform reading instruction. In P. McCardle & K. Pugh (Eds.), *How children learn to read: Current issues and new directions in the integration of cognition, neurobiology and genetics of reading and dyslexia research and practice*. New York: Routledge.

Publications Currently Under Review/Preprints (**^***Student mentee author*)

1. **^**McWeeny, S., **^**Choi, S. J., LaTourette, A., **^**Choe, J., Roberts, M. Y., & **Norton, E. S.** (under review). Rapid automatized naming as a kindergarten predictor of future reading: A meta-analysis.
2. **^**Clement-Lam, S., Grieco-Calub, T., & **Norton, E.S.** (under review). Letter-sound integration is modulated by automaticity demands and is related to reading performance in English-speaking children.
3. **^**Nili, A., Krogh-Jespersen, S., Perlman, S. B., Estabrook, R., Petitclerc, A., Briggs-Gowan, M. J., **Norton, E. S.**, & Wakschlag, L. S. (under review). Joint consideration of inhibitory control and irritability in young children: contributions to emergent psychopathology.
4. Wakschlag, L., Tandon, D., Krogh-Jespersen, S., Petitclerc, A., **^**Nielsen, A., … **Norton, E. S.**, … & Alshurafa, N. (under review). Moving the dial on prenatal stress mechanisms of neurodevelop-mental vulnerability to mental health problems: a personalized prevention proof of concept.
5. Damme, K. S. F., Wakschlag, L. S., Briggs-Gowan, M. J., **Norton, E. S.**, & Mittal, V. A. (accepted for special issue). Multiple early childhood assessment points enhance prediction of psychopathology in adolescence: Improving RDoC with developmental science. *Journal of Abnormal Psychology*. Preprint: https://www.biorxiv.org/content/10.1101/2020.04.30.070714v1

6. Woodruff Carr, K. L., Perszyk, D. R., **Norton, E. S.**, Voss, J. L., Poeppel, D., & Waxman, S. R. (in revision). Developmental changes in auditory-evoked alpha activity underlie the increasing precision with which infants link language and cognition.
7. Ozernov-Palchik, O., Sideridis, G., **Norton, E. S.,** Beach, S. D., Gabrieli, J. D. E., & Gaab, N. (under review). Low phonological or rapid naming skills can disrupt the typical trajectory of reading development: A cusp catastrophe model.

Publications in Preparation

8. **Norton, E. S.**, **^**Manning, B. L., Jones, M., & Roberts, M. (in prep). Neural correlates of naturalistic face-to-face parent-child interaction in typical child development and autism.
9. **^**McWeeny, S., **^**Manning, B. L., Beach, S. D., Eddy, M. D., Gaab, N., & Gabrieli, J. D. E., & **Norton, E. S.** (in prep). Reliability of the ERP mismatch negativity response in kindergartners.
10. **^**Clement-Lam, S., **^**McWeeny, S., **^**Manning, B. L., & **Norton, E.S.** (in prep). The neural correlates of letter-sound integration and its relation to children's reading performance.
11. **^**Harriott, E., Gaab, N., Gabrieli, J. D. E., & **Norton, E. S.** (in prep). How response time variability during a rapid automatized naming task relates to pre-reading skills and future reading ability.
12. **^**Nielsen, A. N., Wakschlag, L., & **Norton, E.S.** (in prep). Linking irritability and functional brain networks: a case for expanding consideration of development and environment in RDoC.
13. **Norton, E. S.**, **^**Cook, K., **^**McWeeny, S., **^**Page, J. M., Briggs-Gowan, M., & Wakschlag, L. (in prep). Parsing the effects of SES on language development: Demographic and psychosocial factors.

Publication Metrics

In Google Scholar as of 8/10/2020:
Citations: 1,775
H-index: 13
i-10 index: 14

AWARDS and HONORS

Clarence Simon Award for Outstanding Teaching and Mentoring 2020
School of Communication, Northwestern University

ASHA Lessons for Success, Invited alumni speaker 2019

Searle Fellow, Searle Center for Teaching and Learning, Northwestern University 2017

ASHA Lessons for Success, Selected participant 2017

MIT Postdoctoral Association Travel Award 2015
Ranked 1st of over 300 applicants from all of MIT, $600 award to present at SSSR

ERP Boot Camp Fellowship, UC Davis Center for Mind and Brain 2013
Full tuition, room/board, and travel award for 10-day EEG/ERP training workshop

Outstanding Young Investigator Award (The Rebecca Sandak Award) 2012
Awarded by Society for the Scientific Study of Reading to one postdoc or junior faculty member per year who shows outstanding promise in research

Outstanding Research Presentation, Tufts Graduate Research Symposium 2012
Best research presentation among Ph.D. students of all disciplines

Graduate Travel Award, Tufts University 2007-2012
Awarded five times for travel to present research at conferences

Sigma Xi Outstanding Thesis Award, Dartmouth College 2005

PEER-REVIEWED CONFERENCE PRESENTATIONS

Talks (**^***Student mentee author*)

Smith, N., **Norton, E.,** Gottfred, C., Lybolt, J., **^**Manning, B., **^**Baime, E., **^**Harriott, E., & Holton, J. (2019). Promises and challenges of converting your skills/ideas into an app. ASHA Convention, Orlando, FL.

Norton, E., ^Lam, S., ^Gillespie, T., ^Harriott, E., & ^Postolowicz, K. (2019). Atypical neural correlates of letter-sound integration in dyslexia. Society for the Scientific Study of Reading, Toronto, Canada.

Gottfred, C., Smith, N., **Norton, E.,** Robinson, T., Lybolt, J., & Hornback, J. (2018). Beginning with Babble: Technology maximizes impact of SLP skills with parents, professional collaborators, and communities. ASHA Convention, Boston, MA.

^Cook, K., Kessler, C., Briggs-Gowan, M., Wakschlag, L., **Norton, E. S.** (2018). How multiple indicators of socio-economic skills and parent psychosocial factors relate to language abilities in a diverse sample of young children. Symposium on Research in Child Language Disorders, Madison, WI.

^Manning, B., **^**Harriott, E., **^**Nuttall, C., & **Norton, E. S.** (2018). A pilot investigation of the efficacy of an app-based, parent-implemented language intervention for toddlers of varying SES. Symposium on Research in Child Language Disorders, Madison, WI.

Gottfred, C., **Norton, E.,** Lybolt, J., Smith, N., & Robinson, T. (2017). Addressing the language impact of growing up from a background of poverty/low resources. ASHA Convention, Los Angeles, CA.

Norton, E. S., Saygin, Z. M., Beach, S. D., Ozernov-Palchik, O., Gaab, N., & Gabrieli, J. D. E. (2017). The utility of EEG and MRI brain measures for predicting future reading difficulty. Society for Research in Child Development, Austin, TX.

Yu, X., Raney, T., **Norton, E. S.,** Saygin, Z. M., Ozernov-Palchik, O., Beach, S. D., Gabrieli, J. D. E., & Gaab, N. (2017). The neural compensatory mechanisms in prereaders with a family history of dyslexia who subsequently develop typical reading skills. Society for Research in Child Development, Austin, TX.

Norton, E. S., Beach, S. D., Saygin, Z. M., Ozernov-Palchik, O., Park, A., Robinson, S., Gaab, N., & Gabrieli, J. D. E. (2016). Brain measures identify which kindergartners at risk for reading difficulties go on to develop dyslexia. Society for the Scientific Study of Reading, Porto, Portugal.

Norton, E. S., Beach, S. D., Ozernov-Palchik, O., Gaab, N., & Gabrieli, J. D. E. (2015). Brain structure differences associated with risk for dyslexia: Different patterns of phonological awareness and RAN deficit subtypes. Society for the Scientific Study of Reading, Kona, HI.

Norton, E. S. (2014). Predicting 1st grade reading from kindergarten ERP, MRI and behavior: Toward accurate early identification of dyslexia. New England Research on Dyslexia Society, Boston, MA.

Norton, E. S., Beach, S., Saygin, Z., Ozernov-Palchik, O., Cyr, A., Halverson, K., Gaab, N., & Gabrieli, J. D. E. (2014). Linking brain structure and function with reading: Relations among arcuate fasciculus structure, ERP mismatch negativity response, and reading-related skills in kindergarten and 1st grade. Society for the Scientific Study of Reading, Santa Fe, NM.

Norton, E. S., Beach, S., Cyr, A., Ozernov-Palchik, O., Perrachione, T., Wolf, M., Gabrieli, J. D., & Gaab, N. (2012). Brain differences in kindergarten children with and without behavioral risk for dyslexia: Toward fMRI and EEG predictors of reading difficulties. Society for the Scientific Study of Reading, Montreal, Canada.

Norton, E. S., Spencer, K. E., & Wolf, M. (2009). Improving reading fluency and comprehension for students with reading disabilities: Comparing phonology-only with multi-componential intervention on key reading outcomes. International Dyslexia Association, Orlando, FL.

Wolf, M., **Norton, E.S.,** Barzillai, M., Ullman, C., & Orkin, M. (2009). Understanding diverse readers: Assessing the unique abilities of each child. International Dyslexia Association, Orlando, FL.

Norton, E. S., Barzillai, M. & Wolf, M. (2008). How the components of RAVE-O instruction simulate the reading brain. International Dyslexia Association, Seattle, WA.

Gaab, N., Kovelman, I., Christodoulou, J. A., Lieberman, D. A., Weinberg, A., Hostetter, M. K., **Norton, E.**, … & Gabrieli, J. D. E. (2007). Learning to read changes the developing brain: Comparing phonological and semantic processing between prereaders and readers. Society for Neuroscience, San Diego, CA.

Petitto, L. A., Baker, S., Baird, A., Kovelman, I., & **Norton, E**. (2004). Near-infrared spectroscopy studies of children and adults during language processing. International Workshop on Near-Infrared Spectroscopy, Cambridge, MA.

Posters (selected)

^Clement-Lam, S. S. Y, **^**Manning, B., **^**McWeeny, S., & **Norton, E. S.** (accepted; 2020 conference cancelled). The unique contribution of letter-sound integration to English-speaking children's reading performance. Society for the Scientific Study of Reading.

^Choi, J., ^McWeeny, S., Roberts, M. Y., & **Norton, E. S.** (accepted; 2020 conference cancelled). Rapid automatized naming as a kindergarten predictor of future reading: A Meta-analysis. Symposium on Research in Child Language Disorders, Madison, WI.

^Nikolaeva, J., Roberts, M. Y., & **Norton, E. S.** (accepted; 2020 conference cancelled). Evaluating reliability and validity of an automated measure of verbal responsiveness among parents of children with autism spectrum disorder. Symposium on Research in Child Language Disorders, Madison, WI.

Woodruff Carr, K., Perszyk, D. R., **Norton, E. S.,** Voss, J. L., & Waxman, S. R. (2019). Alpha oscillatory activity reflects infants' emerging link between sounds and cognition. Society for Neuroscience, Chicago, IL.

^Manning, B., Hampton, L., Roberts, M., & **Norton, E.** (2019). EEG correlates of social engagement during naturalistic parent-child interaction in typical development and ASD. Society for Research in Child Development, Baltimore, MD.

Kessler, C., Sabol, T. J., **Norton, E.,** Heard-Garris, N., Briggs-Gowan, M., & Wakschlag, L. (2019). The effects of early life stress on children's disruptive behaviors: Perceptions matter. Society for Research in Child Development, Baltimore, MD.

Norton, E. S., Sideridis, G., Ozernov-Palchik, O., Beach, S. D., Wolf, M., Gabrieli, J. D. E., & Gaab, N. (2018). Both low phonological and low rapid naming skills disrupt typical patterns of reading develop-ment: A cusp catastrophe model. Society for the Scientific Study of Reading, Brighton, England.

^Lam, S. S. Y., Ozernov-Palchik, O., Beach, S. D., Gaab, N., & Gabrieli, J. D. E. (2018). Modeling relations among rapid automatized naming, processing speed, and reading fluency in early reading development. Society for the Scientific Study of Reading, Brighton, England.

^Harriott, E. M., **^**Manning, B., & **Norton, E. S.** (2018). Examining how parents' language abilities relate to toddler language abilities and growth after a pilot app-based language intervention. Symposium on Research in Child Language Disorders, Madison, WI.

^McWeeny, S., **^**Manning, B., **^**Harriott, E. M., Beach, S. D., Ozernov-Palchik, O., Gabrieli, J., Gaab, N., & **Norton, E. S.** (2018). Reliability of the mismatch negativity in a kindergarten population oversampled for dyslexia risk. Cognitive Neuroscience Society, Boston, MA.

Zuk, J., Dunstan, J., **Norton, E. S.,** Ozernov-Palchik, O., Gabrieli, J., & Gaab, N. (2017). Investigating protective and compensatory mechanisms in kindergarteners at risk for reading impairment who subsequently develop typical reading. Association for Psychological Science Meeting, Boston, MA.

Ozernov-Palchik, O., Brown, M., **Norton, E. S.,** Perrachione, T., Beach, S., Wolf, M., Kuperberg, G., Gaab, N., & Gabrieli, J. (2017). Investigating lexical and perceptual learning effects on phonetic processing in young children with dyslexia. Society for the Scientific Study of Reading, Halifax, Canada.

Norton, E. S., ^Harriott, E. M., **^**Brown, S., **^**Isaacs, S. H., **^**Kaufer, S., **^**Selph, L., Gaab, N., & Gabrieli, J. D. E. (2016). How response time variability during a rapid automatized naming task relates to pre-reading skills and future reading ability. Psychonomic Society Annual Meeting, Boston, MA.

Nayar, K., Hogan-Brown, A., La Valle, C., McKinney, W. Gordon, P. C., Martin, G. E., **Norton, E. S.,** & Losh, M. (2016). Rapid automatized naming as a marker of genetic liability to autism: An eye tracking study. International Meeting for Autism Research, Baltimore, MD.

Zuk, J., Becker, B., **Norton, E.,** Ozernov-Palchik, O., Mauer, M., Beach, S., Hogan, T., Gabrieli, J., & Gaab, N. (2016). Structural brain alterations in kindergarteners with speech sound disorders. Cognitive Neuroscience Society, New York, NY.

Norton, E. S., Beach, S. D., Cyr, A., Ozernov-Palchik, O., Halverson, K., Gaab, N., & Gabrieli, J. D. (2014). Kindergarten pre-reading skills and ERP mismatch negativity predict 1st grade connected text reading fluency. Cognitive Neuroscience Society, Boston, MA.

Litt, R., de Jong, P., **Norton, E. S.**, & Nation, K. (2014). To repeat or not to repeat? The effect of item repetition on RAN performance. Society for the Scientific Study of Reading, Santa Fe, NM.

Ozernov-Palchik, O., **Norton, E. S.**, Beach, S. D., Langer, N., Cyr, A. B., Gabrieli, J. D. E., & Gaab, N. (2013). Subcomponents of early reading correlate with cortical thickness in distinct reading network areas. Organization for Human Brain Mapping, Seattle, WA.

Norton, E. S., Beach, S. D., Ozernov-Palchik, O., Cyr, A. B., Gaab, N., & Gabrieli, J. D. E. (2013). Rapid automatized naming skill is associated with brain activation for orthographic processing in kindergarten children. Cognitive Neuroscience Society, San Francisco, CA.

Saygin, Z., **Norton, E. S.,** Beach, S., Cyr, A., Ozernov-Palchik, O., Gaab, N., & Gabrieli, J. D. E. (2012). Structural connectivity predicts risk for dyslexia in kindergarteners. Society for Neuroscience, New Orleans, LA.

Norton, E. S., Eddy, M., Perrachione, T., Cyr, A., Wolf, M. & Gabrieli, J. D. (2011). ERP mismatch negativity predicts reading fluency in young children. Cognitive Neuroscience Society, San Francisco, CA.

Perrachione, T., Kovelman, I., Ostrovskaya, I., Lymberis, J., O'Loughlin, P., **Norton, E.**, Ghosh, S., & Gabrieli, J. (2009). Temporal and prefrontal cortical contributions to phonological working memory for words and pseudowords. Society for Neuroscience, Chicago, IL.

Norton, E. S., Kovelman, I., Gaab, N., Christodoulou, J. A., Triantafyllou, C., Lieberman, D. A., … & Gabrieli, J. D. E. (2009). Evidence for different neural processing of auditory language phonological awareness in children with developmental dyslexia. Society for the Scientific Study of Reading, Boston, MA.

Ullman, C., **Norton, E. S.,** Gottwald, S., Spencer, K., & Wolf, M. (2009). Evidence for a fluency-specific deficit in developmental dyslexia. Society for the Scientific Study of Reading, Boston, MA.

Norton, E. S., Kovelman, I., Gaab, N., Christodoulou, J. A., Lieberman, D.A., Whitfield-Gabrieli, S., Wolf, M., & Gabrieli, J. D. E. (2009). Neural correlates of auditory phonological processing in typical reading development and dyslexia. Cognitive Neuroscience Society, San Francisco, CA.

INVITED LECTURES / COLLOQUIA

Invited academic colloquia/conference presentations

International Congress on Infant Studies (ICIS) annual conference, held virtually 2020
Invited seminar: Using video chat to conduct remote evaluation of toddler language

University of Michigan, Department of Psychology 2020

Illinois Speech-Hearing-Language Association (ISHA) Conference, Rosemont, IL 2020
Invited featured session speaker

MIT, Department of Brain & Cognitive Sciences/Simons Center for the Social Brain 2019

Brain and Mind Institute Annual Symposium, The Chinese University of Hong Kong 2019

Washington University in St. Louis, Department of Psychiatry 2018

Oberlin College, Department of Neuroscience, 2017
Guest lecture in course "Neurodevelopment in society; utility and applications"

Tufts University, Department of Child Study and Human Development 2016
Proseminar presentation to Ph.D. students

Harvard University, Department of Psychology 2015
Language and Cognition Seminar Series

University of Connecticut, Department of Psychology 2015
Brown Bag Series talk and guest lecture to cognitive science student group

Netherlands Institute for Advanced Study, Wassenaar, Netherlands 2014
Invited presentation at Cross-Linguistic Perspectives on Dyslexia workshop

MIT, Simons Center for the Social Brain 2014
Workshop on The Social Brain: Opportunities for Discovery & Technology Development

MIT, Simons Center for the Social Brain 2013
Simons Social Talk Series, "Fundamentals of MRI and EEG neuroimaging"

Department of Psychiatry, University of California, San Francisco 2013
Colloquium

Children's Hospital Boston, Laboratories of Cognitive Neuroscience, 2011
Colloquium

Dartmouth College, Psychological and Brain Sciences Department, 2008
Cognitive Brown Bag Series

Invited Talks for Professional Organizations

SLANT Literacy Summer Institute, Buffalo Grove, IL 2019
Invited keynote

Association of Educational Therapists Conference, Chicago, IL 2019
Invited keynote

Everyone Reading Illinois Annual Conference, Naperville, IL 2017
Invited presentation to teachers/school administrators/families

Jobs for Dyslexics, Annual Gala, Chicago, IL 2016
Invited keynote presentation to stakeholders, donors, and families

Everyone Reading Illinois Annual Conference, Naperville, IL 2016
Invited presentation to teachers/school administrators/families

Watertown Public Schools, Watertown, MA 2012
Professional development for elementary school teachers

Landmark School, Beverly MA 2011
Professional development for teachers, full-day workshop

Invited Talks at Northwestern University

Family Weekend, *Invited speaker* 2019

Women in Science and Engineering Research (WISER) 2019

Department of Communication Sciences & Disorders, Alumni Conference 2016, 2018

Center for Talent Development, *Invited presentation to teachers/families* 2017

Cognitive Brain Mapping Group, *Colloquium* 2015

TEACHING

At Northwestern University

Cognitive Neuroscience of Human Communication, CSD 369/395 2018-present (2 times)
This undergraduate seminar includes didactic discussions of published papers and critical reflections in order to help students become critical readers of cognitive neuroscience literature. Students design and execute an ERP study as part of the course. Enrollment is 4-6 students (capped at 8).

Language Development and Usage, CSD 392 2017-present (3 times)
This undergraduate course gives an overview of language development from birth through adulthood, in typical development and in children who are bilingual, acquiring a signed language, in poverty, or have a language disorder. Research methods and inquiry are highlighted. Enrollment 20-40 students.

Seminar: Experimental and Theoretical Aspects of Audiology, CSD 516
Co-led with other members of CSD faculty 2017-present (8 times)
The goal of this PhD student seminar is to review major and emerging issues in hearing sciences and their relation to broader communication. Students engage in a journal club format to evaluate articles from the literature in terms of their rigor and argumentation.

Pediatric Language Disorders, CSD 492 2016-2017 (4 times)
This course for MS-SLL students provides an overview of the etiology, characteristics, and treatment approaches for children with primary and secondary language disorders. Students complete assignments designed to develop their practical skills, such as weighing the evidence for different treatment approaches for a particular child's profile. Enrollment 25-37 students.

Honors Thesis Seminar 2016-present (4 years)
As chair of the undergraduate honors committee, I work with students individually and lead four seminar meetings for students completing an honors thesis. Seminars focus on development of their projects from communicating methods and results to developing an effective spoken presentation. 2-6 students per year complete the honors thesis.

Other teaching

Harvard University, Department of Psychology, 2010
Social Development, Teaching Fellow (2 times), Prof. Craig Smith**,**

Tufts University, Department of Child Development, 2007-2010
Introduction to Child Development, Lead Teaching Assistant (2 times), Prof. Maryanne Wolf
Language Development, Teaching Assistant (3 times), Prof. Chip Gidney

Landmark School, Beverly, MA, 2005-2006
Faculty Member, Taught two sections each of Biology and Chemistry for high school students with language-based learning disabilities. Taught daily one-on-one reading tutorials for two students with dyslexia.

PROFESSIONAL ACTIVITIES

Grant review panels: NIH LCOM (Language and Communication) Review Panel, June 2018
ASHA Grants Review Panel, 2018, 2019, 2020

Ad-hoc grant review: Hong Kong Innovation and Technology Commission, 2018
NIH Building Infrastructure Leading to Diversity Initiative (U54), 2017
NSF Developmental and Learning Sciences Research Program, 2016
Graduate Women in Science Research Awards, 2016
US-Israel Binational Science Foundation, 2014

***Journal editorial boards*:** *Scientific Studies of Reading,* 2019-present
Journal of Learning Disabilities, 2017-present
Journal of Speech, Language, and Hearing Research, 2018-2019

Ad-hoc journal review: (past 3 years)

American Journal of Speech-Language Pathology
Brain Research
Brain Structure & Function
Cerebral Cortex
Cortex
Developmental Cognitive Neuroscience
Developmental Psychology
Developmental Science
Journal of the American Academy of Child & Adolescent Psychiatry
Journal of Educational Psychology
Journal of Experimental Child Psychology
Journal of Research in Reading
Mind, Brain & Education
NeuroImage
Neuropsychologia
PLoS One
Psychophysiology
Reading & Writing
The Journal of Neuroscience
Trends in Neuroscience & Education

Advisory boards: LEAP (Language Empowers All People), Chicago IL,
"Bridging the word gap" grant project, 2015-2016
Academic advisory panel, 2016-present
Illinois State Board of Education, Reading Teacher/Reading Specialist Certification Advisory Panel, 2017

University service: Northwestern Institute for Innovations in Developmental Sciences, Executive committee member and co-director of Neurodevelopmental Core, 2016–present
Advisor, Desire 2 Aspire (mentoring group for undergraduate women to support elementary-age girls), 2019–present
Committee on the first-year experience, School of Communication, 2017
Faculty search committee, Department of Psychology, 2017

School / departmental service: Module designer and coordinator, The Communicating Brain, 2018–present
Module coordinator, Children and Communication, 2019-2020
Undergraduate committee, Chair, 2018-present, member 2015–present
PhD program committee, 2015–present
CSD faculty search committee, 2016–2017

Society memberships: Cognitive Neuroscience Society, 2008–present
International Dyslexia Association, 2007–2012
Society for Neuroscience, 2007–present
Society for Research in Child Development, 2016–present
Society for the Scientific Study of Reading, 2009–present
Voting Member, 2015–present

Conferences and symposia organized:

"Understanding the autism spectrum: Clinical, biological, and cultural perspectives," conference at Northwestern University, co-organized with Molly Losh and Megan Roberts, 2019.

"Learning and learning disabilities," Symposium co-organized with Steve Zecker and CSD department for Northwestern CSD Connect Conference, 2018.

"New insights into reading development and disorders from diverse brain imaging modalities" Symposium co-organized with Robin Litt at the Society for the Scientific Study of Reading conference, Porto, Portugal, 2016.

"Neurobiology, neurochemistry, and genetics of dyslexia" Symposium co-organized with Nicole Landi at the Society for the Scientific Study of Reading conference, Kona, Hawaii, 2015.

STUDENT MENTORING

Northwestern PhD students, primary advisor

Silvia Clement-Lam, Ph.D. '19 (2015-2019)
Brittany Manning, CCC-SLP (2016-present)
Sean McWeeny (2016-present)
Julia Nikolaeva (2019-present)
Jinnie (Soujin) Choi (2019-present)

Northwestern PhD students, doctoral program/thesis committee member

Peiyao Chen, Ph.D. '19 (2015-2019)
Phillip Curtis (2016-2019)
Lisa Gresch, CCC-SLP (2017-2019)
Allison Hilger, CCC-SLP, Ph.D. '20 (2017-2018; lab rotation supervisor)
Kritika Nayar, Ph.D. '20, Clinical Psychology (2015-2020)
Amanda Nili (2017-present; NIH diversity supplement co-mentor)
Bailey Sone CCC-SLP (2019-present)
Yael Stern (2016-present)
Devin St. John (2015-2016; lab rotation supervisor)
Kenya Thomas (2019)
Kristi Ward, Ph.D.-Au.D. '20 (2017-2020; NIH F31 co-sponsor)

Postdoctoral Scholars, primary mentor

Jessica Page, Ph.D. (2018-present)
Ashley Nielsen, Ph.D. (2019-present)

Northwestern MS-SLL (speech-language pathology) student research assistants

Biya Ahmed, '19 (Fall 2017-Fall 2018)
Emma Baime '20 (diagnostic clinical placement, Fall 2018-Spring 2020)
Maggie Boland, '19 (Winter 2017-Spring 2019)
Sara Brown '17 (Spring 2016-Spring 2017)
Celia Kaufer '17 (Spring 2016-Spring 2017)
Eliana Cashman '19 (Fall 2017-Spring 2019)
Kiera Cook '18 (thesis student, Winter 2017-Spring 2018)
Shauna Czarnik '17 (Winter 2017)
Alexandra Harpole '20 (honors thesis, diagnostic clinical placement, Fall 2018-Spring 2020)
Ann Lee '17 (Winter-Spring 2017)
Shradha Mehta '18 (Summer-Fall 2017)
Camille Nuttall '20 (Fall 2018-Spring 2020)
Heather Turnbull '17 (Winter-Spring 2017)
Gabrielle Schwarte, '18 (diagnostic clinical placement, Summer 2018)
Linda Selph '17 (Spring 2016)
Alice Wang (Fall 2019-present)

Northwestern undergraduate students

Honors/grants/awards: early research experience award (EREA), undergraduate research assistant (URAP), undergraduate research grant (URG)

Emma Baime '18 (2017-2018)
June Choe '20 (2019-2020)
Emily Harriott '19 (EREA, URAP, URG, advanced URG, all-school outstanding sophomore honor, alumnae award, honors thesis, 2015-2019)
Shelby Isaacs '18 (independent study, honors thesis, 2016-2018)
Yuri Jo (independent study, 2018-present)
Jissmaria Karickal '20 (summer alumnae grant, independent study, 2019-present)
Haroon Khan '20 (2019)
Natalia Kolek '22 (2020-present)
Winnie Liang (EREA, all-school outstanding sophomore honor, 2018-present)
Jade Tierra Mitchell '18 (independent study, 2017-2018)
Olufemi Nyabingi (Weinberg summer research grant, URG, 2019-present)

Skylar Ngozichukwu Ozoh '19 (URG, 2017-2019)
Meakailyn Philips (EREA, 2019-present)
Kamila Postolowicz '20 (EREA, undergraduate language grant, independent study, 2017-2020)
Anuradha Raife '20 (2019-2020)
Cadence Reed-Bippen '20 (EREA, 2016-2020)
Maddie Ratkowski (2018)
Ola Wicko (2020-present, summer internship grant)
Ambreen Zaidi '20 (2019-2020)
Kevin Zhang '19 (URG, 2016-2017)

***Other students/mentees*:**

Jolie Davidson (Tufts), Summer 2019
Remi Weibel (Middlebury) Summer 2019
Naomi Fischoff (HS) Summer 2018
Camille Nuttall (BYU), Summer 2017
Elizabeth Hasseltine (UVA), Summer 2014, 2015
Blair Daniel (Wellesley), Fall 2014-Spring 2015
Lucy Cronin-Golomb (Tufts), Summer 2015
Madlyn Kates (HS), Summer 2014
Ebenezer Nkwate (MIT), Summer 2014
Maria Ruiz (MIT), Spring 2014
Andrew Peach (SLP clinical fellowship), 2013
Cirkine Sherry (HS), Summer 2013
Candice Coulter (post-baccalaureate), 2012
Gina DiStefano (HS), Summer 2012
Jessie Hild (HS), Summer 2012

MEDIA and PRESS COVERAGE

Press coverage of "Relations between toddler expressive language & temper tantrums" paper 2019
Covered by Science Daily, Consumer Affairs, ecounseling.com, the Daily Northwestern, others. International: Times of Malta, The Sector (Australia), Babyology (Australia), Southern Weekly (China). Top 10 most-read story of the year on Northwestern News: https://news.northwestern.edu/stories/2019/11/toddler-speech-delays-and-temper-tantrums/
Reddit: #1 post on /r/science, #15 on r/all
NBC Chicago: https://www.nbcchicago.com/news/local/researchers-look-into-link-between-delayed-speech-severe-tantrums-in-toddlers/2188621/
Parents magazine: https://www.parents.com/news/late-talkers-more-tantrums/
ASHA Leader: https://leader.pubs.asha.org/doi/10.1044/leader.RIB1.25032020.16
Fatherly.com: https://www.fatherly.com/health-science/toddler-tantrums-for-late-talkers/

"Blame it on Gutenberg" Documentary, featured expert, Black Pearl Productions/ Filmmakers Collaborative, https://vimeo.com/342004109 2019

Interview on myths about dyslexia, Society for Neuroscience's brainfacts.org 2018
http://www.brainfacts.org/diseases-and-disorders/childhood-disorders/2018/do-people-with-dyslexia-read-and-write-backwards-082218

Press coverage of "Connectivity Precedes Function in the VWFA" paper 2016
Covered by Ars Technica, Science Daily, and others. MIT News Office article: http://news.mit.edu/2016/brain-connections-key-reading-0808. Commentary in issue by Dehaene & Dehaene: http://www.nature.com/neuro/journal/v19/n9/full/nn.4369.html

NPR, "Here and Now" story on dyslexia prediction research 2014
Story about dyslexia and brain imaging research with kindergarteners produced by WBUR Boston: http://hereandnow.wbur.org/2014/07/22/dyslexia-brain-research

Press coverage of "Tracking the Roots of Reading Ability" paper 2013

Covered by the BBC, CBS News, US News and World Report, Boston Public Radio/WBUR, Fox, Boston Magazine, and others. MIT News Office article and video: http://web.mit.edu/newsoffice/2013/brain-scans-may-help-diagnose-dyslexia-0813.html

Newsweek, "Is Brain-Based Learning a Myth?" 2012

Discussed findings from "Are There Separate Neural Systems for Spelling?" paper: http://www.newsweek.com/brain-based-learning-myth-103817

PUBLIC OUTREACH AND ADVOCACY

Professional Development/Consultation, School District #37/AVOCA, Wilmette, IL

- Provided consultation on reading assessment and instruction to teachers and administrators, 2020

Decoding Dyslexia – Virginia branch

- Provided consultation on screening for dyslexia in kindergarten, 2019-2020

Northwestern National High School Institute summer program in CSD and Neuroscience

- Program organizing committee, 2019
- Presented workshops on scientific communication and brain imaging tools to diverse students

Illinois State Board of Education

- Served as a member of workgroup on revision of Reading Specialist and Reading Teacher licensing and endorsement standards, 2017

Jobs for Dyslexics

- Delivered invited keynote at yearly fundraising dinner
- Provided consultation on science of dyslexia

Everyone Reading Illinois

- Presented to annual conference for teachers, clinicians and parents, 2016 and 2017

Decoding Dyslexia – Massachusetts branch

- Provided expert testimony regarding dyslexia legislation to MA Congress Joint Education Committee
- Organized two meetings on dyslexia research with state Secretary of Education
- Provided pro-bono consulting to individual families on dyslexia intervention/assessment

Landmark School

- Wrote invited blog for Landmark360.org on dyslexia brain research
- Panel member for student career day and for presentations to faculty about dyslexia research

READ Study partner schools

- Presented to several parent and teacher groups about reading development and dyslexia
- Designed and carried out "brain awareness days" for kindergarten students