

Elizabeth S. Norton, Ph.D.

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CURRENT APPOINTMENTS

Northwestern University, Evanston, IL 2015-present
Assistant Professor, Department of Communication Sciences & Disorders, School of Communication;
by courtesy, Department of Medical Social Sciences, Feinberg School of Medicine
Principal Investigator, Language, Education and Reading Neuroscience (LEARN) Lab,
<http://learnlab.northwestern.edu>
Co-Director, Neurodevelopmental Resource 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

Currently Funded Grants

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

NIH – NIDCD R01 DC016273 (MPIs Norton & L. Wakschlag) <i>The When to Worry about Language Study (W2W-L): Joint consideration of developmental patterning and neurodevelopmental context for enhancing early identification of language impairment.</i> Total direct costs: \$2,498,151 Diversity supplement to R01 DC016273 to support research coordinator Total direct costs: \$52,000	2018- 2023
Northwestern Memorial Foundation Dixon Translational Research New Investigator Award (PI Norton), <i>Neural biomarkers of language in preterm infants.</i> Direct costs: \$34,851	2018- 2019
NIH – NICHD R03 HD096098 (PI T. Perrachione, Boston University) <i>Cortical development and neuroanatomical anomalies in developmental dyslexia.</i> Role: Consultant	2018- 2020
Delaney Fund for Research and Communication Grant (PI Norton) <i>'Beginning with Babble' to improve language development and communication health in low-SES toddlers and their parents: a randomized control pilot intervention study.</i> Direct costs: \$46,304	2017- 2019
NIH – NICHD R01 HD083310 (PI S. Waxman) <i>Linking language and cognition in infancy: Entry points and developmental change.</i> (Competing revision to R01 – adding EEG/ERP to existing paradigm) Role: Co-Investigator	2017- 2020
AHA Strategically-Focused Research Network Grant (PI B. Marino) <i>Cardiovascular health in children – Healthier, earlier.</i> Role: Co-Investigator and Mentor	2017- 2020
NIH – NIMH R01MH107652 (PI L. Wakschlag) <i>Generating an earlier science of when to worry: A neurodevelopmental, transactional approach to characterizing irritability patterns beginning in infancy.</i> Role: Co-investigator	2016- 2021
NIH – NIMH U01MH082830 (PI L. Wakschlag) <i>Dimensions of early temper loss & low concern: Clinical utility & mechanisms.</i> Role: Co-investigator	2016- 2019

Grants Under Review/Pending

NIH – NIDA R34 DA050266 (PI L. Wakschlag) <i>Optimizing access, engagement and assessment to elucidate prenatal influences on neurodevelopment: The Brains Begin Before Birth (B4) Midwest Consortium</i> Role: Co-Investigator Impact score: 28	2019- 2021
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Completed Grants and Fellowships

Alumnae of Northwestern University Grant, <i>Predicting children's response to intensive summer language intervention</i> Role: PI Direct costs: \$4,081	2016
Northwestern University Undergraduate Research Assistant Program Role: PI for summer funding of lab students Direct costs: \$3,500	2016

Simons Center for the Social Brain, Schwinn Family Postdoctoral Fellowship, MIT Role: Fellow, 2 years salary + \$10,000 research expenses	2013–2015
National Science Foundation Graduate Research Fellowship Role: Fellow, 3 years stipend + tuition + \$10,000 research expenses	2007–2010
Evans Literacy Fellowship, Tufts University Role: Fellow, 1 year stipend + tuition	2006–2007
Filene Fellowship in Psychological & Brain Sciences, Dartmouth College Role: Fellow, \$4,000 stipend	2004–2005
Hodgson Grant for Cognitive Neuroscience Research, Dartmouth College Role: Fellow, \$2,000 research grant	2004
Waterhouse Research Grant, Dartmouth College Role: Fellow, \$1,500 research grant	2003
Rothenburg Grant, Dartmouth College Role: Fellow, \$1,000 research stipend	2002

PUBLICATIONS

Published Peer-Reviewed Manuscripts

(^Student mentee author)

20. ^Manning, B. L., Roberts, M. Y., Estabrook, R., Petitclerc, A., Burns, J., Briggs-Gowan, M., Wakschlag, L. S., & **Norton, E. S.** (in press). Relations between toddler expressive language and temper tantrums in a community sample. *Journal of Applied Developmental Psychology*.
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*. <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*. <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.

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. D., Halverson, K. 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://dx.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.**, Gaab, N., & Gabrieli, J. D. E. (2019). Neural predictors of dyslexia. In L. Verhoeven, K. Pugh, & C. Perfetti (Eds.), *Dyslexia across languages and writing systems: A handbook*. 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 submitted/under review

(^Student mentee author)

1. **Norton, E. S.**, Saygin, Z. M., Beach, S. D., Whitfield-Gabrieli, S., Ghosh, S., Minas, J., Ozernov-Palchik, O., Gaab, N., & Gabrieli, J. D. E. (in revision). White matter microstructure and behavior predict which kindergarten children at risk for dyslexia become good versus poor readers.
2. Yu, X., Zuk, J., Purdue, M. V., Ozernov-Palchik, O., Raney, T., Beach, S., **Norton, E. S.**, Gabrieli, J., & Gaab, N. (in revision). Protective neural mechanisms in pre-readers with a family history of dyslexia who subsequently develop typical reading skills. BiorXiv: <https://doi.org/10.1101/707786>
3. Luby, J., Allen, N., Estabrook, R., Pine, D., Rogers, C., Krogh-Jespersen, S., **Norton, E. S.**, & Wakschlag, L. (in revision). Mapping infant neurodevelopmental precursors to mental disorder: Enhancing prediction of early childhood psychopathology via synthetic cohort & computational approaches. *Behavior Research and Therapy*.
4. Zuk, J., Dunstan, J., **Norton, E. S.**, Yu, X., Ozernov-Palchik, O., Wang, Y., Hogan, T., Gabrieli, J., & Gaab, N. Multifactorial pathways facilitate resilience among kindergarteners at risk for dyslexia: A longitudinal behavioral and neuroimaging study. BiorXiv: <https://doi.org/10.1101/618298>
5. ^McWeeny, S., & **Norton, E. S.** (submitted). Event related potentials (ERPs) in speech and language research: a tutorial review.

Publications in preparation – drafted, to be submitted

7. Norton, E. S., ^Manning, B. L., Jones, M., & Roberts, M. (in prep). Neural correlates of naturalistic parent-child interaction in typical child development and autism.
8. ^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.
9. **Norton, E. S.**, Sideridis, G., Ozernov-Palchik, O., Beach, S. D., Gabrieli, J. D. E., & Gaab, N. (in prep). Low phonological or rapid naming skills can disrupt the typical trajectory of reading development: A cusp catastrophe model.
10. ^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.
11. **Norton, E. S.**, ^Cook, K., ^Page, J. M., Briggs-Gowan, M., & Wakschlag, L. (in prep). Parsing the effects of SES on language development: Demographic and psychosocial factors.
12. Litt, R., de Jong, P., Nation, K., & **Norton, E.S.** (in prep). To repeat or not to repeat? The effect of item repetition on RAN performance and its relation with reading ability.

Publication metrics

Citations in Google Scholar as of 9/15/19: 1,374

H-index in Google Scholar as of 9/15/19: 12

AWARDS and HONORS

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 <i>Ranked 1st of over 300 applicants from all of MIT, \$600 award to present at SSSR</i>	2015
ERP Boot Camp Fellowship , UC Davis Center for Mind and Brain <i>Full tuition, room/board, and travel award for 10-day EEG/ERP training workshop</i>	2013
Outstanding Young Investigator Award (The Rebecca Sandak Award) <i>Awarded by Society for the Scientific Study of Reading to one postdoc or junior faculty member per year who shows outstanding promise in research</i>	2012
Outstanding Research Presentation , Tufts Graduate Research Symposium <i>Best research presentation among Ph.D. students of all disciplines</i>	2012
Graduate Travel Award , Tufts University <i>Awarded five times for travel to present research at conferences</i>	2007-2012
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 socioeconomic 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 difficulties. 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 inter-vention 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)

- 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.**, Osher, D., 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

Illinois Speech-Hearing-Language Association (ISHA) Conference <i>Invited speaker (3 sessions)</i>	2020
MIT Simons Center for the Social Brain, Cambridge, MA <i>Invited colloquium</i>	2019
SLANT Literacy Summer Institute, Buffalo Grove, IL <i>Invited keynote</i>	2019
Association of Educational Therapists Conference, Chicago, IL <i>Invited keynote</i>	2019
Brain and Mind Institute Annual Symposium, The Chinese University of Hong Kong <i>Invited talk on early language and reading development</i>	2019
Department of Psychiatry, Washington University, St. Louis MO <i>Invited talk on pediatric EEG</i>	2018
Everyone Reading Illinois Annual Conference, Naperville, IL <i>Invited presentation to teachers/school administrators/families</i>	2017
Center for Talent Development, Northwestern University <i>Invited presentation to teachers/families</i>	2017
Jobs for Dyslexics, Annual Gala, Chicago, IL <i>Invited keynote presentation to stakeholders, donors, and families</i>	2017
Everyone Reading Illinois Annual Conference, Naperville, IL <i>Invited presentation to teachers/school administrators/families</i>	2016
Department of Neuroscience, Oberlin College <i>Guest lecture in course "Neurodevelopment in society; utility and applications"</i>	2016
Department of Child Study and Human Development, Tufts University <i>Proseminar presentation to Ph.D. students</i>	2016
Department of Communication Sciences & Disorders, Northwestern University <i>Invited presentation to CSD Alumni Conference</i>	2016
Department of Psychology, Harvard University <i>Language and Cognition Seminar Series</i>	2015
Cognitive Brain Mapping Group, Northwestern University <i>Colloquium</i>	2015
Department of Psychology, University of Connecticut <i>Brown Bag Series talk and guest lecture to cognitive science student group</i>	2015

Landmark College Summer Institute, Landmark College, Putney, VT <i>Professional development seminar, "The new neuroscience of learning and teaching"</i>	2015
Netherlands Institute for Advanced Study, Wassenaar, Netherlands <i>Invited presentation at Cross-Linguistic Perspectives on Dyslexia workshop</i>	2014
Simons Center for the Social Brain, MIT, Cambridge MA <i>Workshop on The Social Brain: Opportunities for Discovery & Technology Development</i>	2014
Simons Center for the Social Brain, MIT, Cambridge, MA <i>Simons Social Talk Series, "Fundamentals of MRI and EEG neuroimaging"</i>	2013
Department of Psychiatry, University of California, San Francisco <i>Colloquium</i>	2013
Watertown Public Schools, Watertown, MA <i>Professional development for elementary school teachers</i>	2012
Landmark School, Beverly MA <i>Professional development for teachers, full-day workshop</i>	2011
Laboratories of Cognitive Neuroscience, Children's Hospital Boston <i>Colloquium</i>	2011
Psychological and Brain Sciences Department, Dartmouth College, Hanover, NH <i>Cognitive Brown Bag Series</i>	2008

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.

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 special cases, such as bilingual, language poverty, language disorder, and signed language development. Research methods and inquiry are highlighted. Enrollment: 20.

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. Mean enrollment is ~35 students.

Honors Thesis Seminar

2016-present (3 academic 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. 3-6 students per year complete the honors thesis.

Other teaching

Social Development, Teaching Fellow, Spring 2010, Fall 2010
Harvard University, Department of Psychology, Prof. Craig Smith

Introduction to Child Development, Lead Teaching Assistant, Spring 2008, Spring 2009
Tufts University, Department of Child Development, Prof. Maryanne Wolf

Language Development, Teaching Assistant, Fall 2007, Fall 2008, Spring 2010
Tufts University, Department of Child Development, Prof. Chip Gidney

Faculty Member, Landmark School, Beverly, MA, 2005-2006
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, July 2018, July 2019

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

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
Advisory Panel, 2017

Ad-hoc journal review: (past 3 years)

American Journal of Speech-Language Pathology
Brain Imaging and Behavior
Brain Research
Brain Structure & Function
Cortex
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
Journal of Visualized Experiments (JoVE)
Language & Linguistics Compass
Mind, Brain & Education
NeuroImage
Neuropsychologia
PLoS One
Psychophysiology
Reading & Writing
The Journal of Neuroscience
Trends in Neuroscience & Education

University service: Northwestern Institute for Innovations in Developmental Sciences,
Executive committee member and co-director of Neurodevelopmental
Core, 2016–present
Committee on the first-year experience, School of Communication, 2017
Faculty search committee, Department of Psychology, 2017

School / departmental service: Module director, The Communicating Brain, 2018–present
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 (2015-present)
Brittany Manning, CCC-SLP (2016-present)
Sean McWeeny (2016-present)
Julia Nikolaeva (2019-present)
Sou Jin (Jinnie) Choi (2019-present)

Northwestern PhD students, doctoral/thesis committee member

Bailey Sone (2019-present)
Peiyao Chen, PhD (2015-2019)
Phillip Curtis (2016-2019)
Lisa Gresch, CCC-SLP (2017-2019)
Allison Hilger (2017-2018; lab rotation supervisor)
Kritika Nayar (2015-present)
Amanda Nili (2017-present; NIH diversity supplement co-mentor)
Yael Stern (2016-present)

Devin St. John (2015-2016; lab rotation supervisor)
Kenya Thomas (2019-present)
Kristi Ward (2017-present; NIH F31 co-sponsor)

Postdoctoral Scholars, primary mentor

Jessica Page, PhD (2018-present)
Ashley Nielsen, PhD (2019-present)

Northwestern MS-SLL (speech-language pathology) students

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

Northwestern undergraduate students,

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

Emma Baime '18 (2017-2018)
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 (2018-present)
Jissmaria Karickal (2019-present, summer alumnae grant)
Haroon Khan (2019-present)
Skylar Ngozichukwu Ozoh '19 (URG, 2017-2019)
Winnie Liang (EREA, 2018-present)
Jade Tierra Mitchell '18 (independent study, 2017-2018)
Olufemi Nyabingi (Weinberg summer research grant, 2019-present)
Kamila Postolowicz (EREA, Undergraduate Language Grant, 2017-present)
Cadence Reed-Bippen (EREA, 2016-present)
Maddie Ratkowski (2018)
Kevin Zhang '19 (URG, 2016-2017)

Other students/mentees:

Jolie Davidson (undergraduate, Tufts), Summer 2019
Remi Weibel (undergraduate, Middlebury) Summer 2019
Naomi Fischhoff (high school student), Summer 2018
Camille Nuttall (undergraduate, BYU), Summer 2017
Elizabeth Hasseltine (undergraduate, UVA), Summer 2014, 2015
Blair Daniel (undergraduate, Wellesley), Fall 2014-Spring 2015
Lucy Cronin-Golomb (undergraduate, Tufts), Summer 2015

Madlyn Kates (high school student), Summer 2014
 Ebenezer Nkwate (undergraduate, MIT), Summer 2014
 Maria Ruiz (undergraduate, MIT), Spring 2014
 Andrew Peach (SLP clinical fellowship), Fall-Winter 2013
 Cirkine Sherry (high school student), Summer 2013
 Candice Coulter (post-baccalaureate), Summer-Fall 2012
 Gina DiStefano (high school student), Summer 2012
 Jessie Hild (high school student), Summer 2012

MEDIA and PRESS COVERAGE

- “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 in *Mind, Brain and Education*, <http://www.newsweek.com/brain-based-learning-myth-103817>

PUBLIC OUTREACH AND ADVOCACY

Decoding Dyslexia – Virginia branch

- Provided consultation on screening for dyslexia in kindergartens, 2019

Northwestern CSD/National High School Institute summer program

- Program organizing committee, 2019
- Presented workshops on scientific communication and brain imaging tools to diverse high school 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 MA Secretary of Education Matthew Malone
- 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