

# COGNITIVE RECOVERY LAB



Issue 7 • Summer 2023

## 2022 - 2023 HIGHLIGHTS

We have had a busy year in the lab! Our **new ReadMap study** is up and running! Reading is very difficult for many people after their stroke. We hope ReadMap will help us understand this problem, which is called alexia. Understanding specific types of reading problems, and how people get better over time, is the first step toward finding new ways to treat alexia.

We started planning ReadMap last summer. After many months, our new tasks and MRI are finished. We are now enrolling participants in both ReadMap and BUILD! We are so grateful to everyone who has participated in our studies over the past year, and for everyone that has expressed interested in participating in ReadMap!



Top row left to right: Natalya Vladenko, Peter Turkeltaub, Sara Dyslin, Elizabeth Chang, Ryan Staples, D. Seles Gadson, Alycia Laks, Sarah Snider, Trini Kelly, Andrew DeMarco  
Bottom row left to right: Karina Diaz, Victoria Hannett, Anushka Oak, Jonathan Slawitsky, Devna Mathur, Sarah Phillips, *not pictured*: Kelly Martin and Kyle Shattuck

## RECENT NEWS

We have a new doctor to celebrate! In February, Tyler Ketchabaw defended his thesis, *Different folks, different strokes: Implications of premorbid language network variability on post-stroke aphasia outcomes*. Dr. Ketchabaw has now returned to finish medical school. We are so proud of all he accomplished while in the lab and we miss him already!



After a decade, Elizabeth Lacey, our former Research Associate, is taking a break from research to spend more time with her young children. We can't blame her – look how cute her kids are! If any former participants want to stay in contact with Elizabeth, she'd love updates! Her email is [EHLACEY@gmail.com](mailto:EHLACEY@gmail.com).

Candace van der Stelt has transferred to the University of Pittsburgh to finish her PhD. We wish her the best!

Caitlin McDermott, one of our undergraduate research assistants, graduated in May. Congratulations! Thank you for all of your hard work.

We continue to offer [free lectures](#) to speech-language pathologists in the area. Our hope is to make research and neuroscience more accessible to clinicians. We love getting to share science updates with local therapists!

Dr. Turkeltaub is now a Principal Investigator for the Stroke Central Atlantic Network for Research (SCANR). SCANR is an NIH-funded partnership of hospitals doing clinical trials for stroke. It's one of 25 regional partnerships in the national StrokeNet network.

## WELCOMING NEW LAB MEMBERS

We are incredibly excited to welcome Devna Mathur, BS, as a Research Specialist! Devna graduated from University of Pittsburgh this May with a degree in Psychology. Before joining the lab, she was involved in two research labs where she



explored topics such as circadian rhythms in mood disorders and cognitive development in older adults. She is interested in neuroplasticity, treatment of aphasia, and factors that can help with stroke recovery.



Natalya Vladyko joined the lab in the spring and will now be starting her second year as a PhD student in the Interdisciplinary Program in Neuroscience. Natalya is co-mentored by Drs. Elissa Newport and Peter Turkeltaub. She is interested in language processing and brain plasticity after strokes at the time of birth and adult strokes.

Ryan Staples joined our team this summer as a postdoctoral fellow! Ryan is a cognitive neuroscientist. His research uses computer models and brain imaging to better understand language processing and recovery after stroke. His training with us focuses on lesion-symptom mapping analyses and developing ways to map the brain basis of reading using computational models.



We also have new undergraduate research assistants in the lab: Linlee Mangialardi and Anjali Krishnan. Hooray for a growing team with diverse backgrounds!

## ALUMNI NEWS

Andrew DeMarco finished his postdoctoral fellowship with us in July. He is now an Assistant Professor here at Georgetown! His lab will study neuroplasticity and rehabilitation after stroke. We are excited to see his new research!

Vivian Dickens, who finished his PhD in 2021, graduated medical school this spring. He was the valedictorian of his class, and won multiple awards for his outstanding academic performance. He is now in a Neurology Residency at University of Pennsylvania. We're so proud of him! His patients are in great hands.

Mackenzie Fama, former graduate student and Assistant Professor in the Department of Speech, Language, and Hearing Sciences at The George Washington University, has started a new study investigating inner speech and naming. Check out her new [lab website!](#)

Joshua McCall, former graduate student, and his wife, Meezah, welcomed their first child this July! Congratulations!

## THANK YOU TO OUR PARTICIPANTS

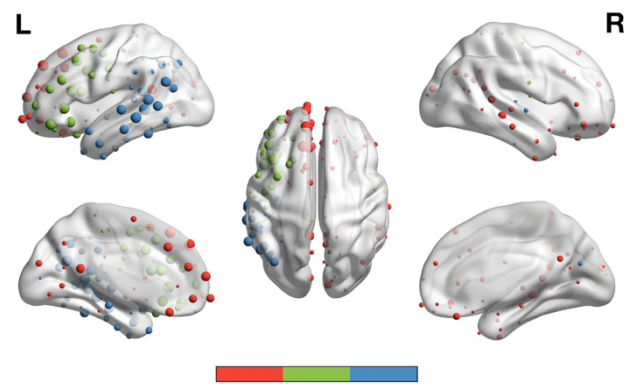
We enrolled 23 participants in the BUILD study this past year. In total, we have now enrolled 179 BUILD participants! We also started enrollment for our ReadMap study! We have now enrolled 4 participants. We continue to run a weekly “Conversation Group” for individuals with aphasia over Zoom. We love supporting stroke survivors in the area.

Below we’ve highlighted our publications and presentations over the last year. Thank you to our participants for contributing to the study of stroke and aphasia!

**We are recruiting!** If you or someone you know may be interested in participating in research, please reach out to us. We can schedule a phone screening to discuss the study and eligibility. See the last page of this newsletter for contact information and more detail on our current studies, BUILD and ReadMap. We love hearing from you (and love referrals—please keep those coming!).

## NEW RESEARCH PUBLICATIONS

Tyler Ketchabaw published a paper in *Brain Structure and Function* investigating how language function in the brain relies on a network of connections rather than a single part of the brain. We focused on the semantic system, which refers to how we store the meanings of words. The results support a tri-network semantic model. This model suggests that there are three main brain networks involved when using information related to word meanings. This may be important for better understanding the connection between semantic deficits and brain changes in post-stroke aphasia.

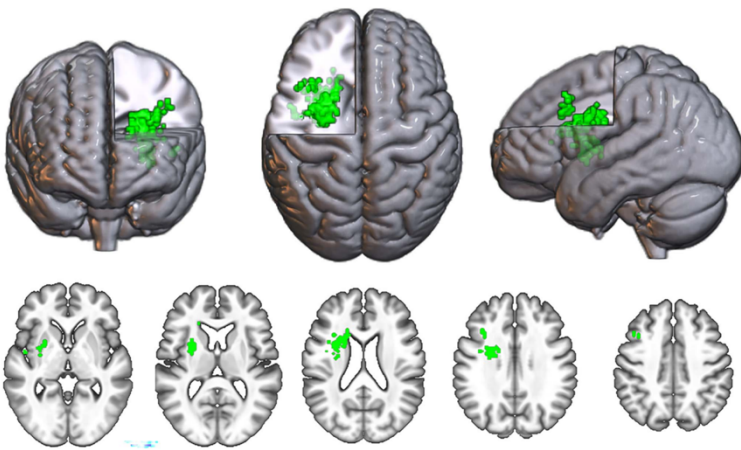


Red, green, and blue nodes showing brain networks involved in the semantic system

D. Seles Gadson published a paper in *Journal of Communication Disorders*. Past research has demonstrated that there are differences in language performance between Black and White American stroke survivors with aphasia. In this study, we investigated how race, socioeconomic status, and neurological factors impact aphasia and stroke severity. We found that race disparities are largest when strokes are large. We think there are two explanations for the difference in language performance: 1) there are disparities in access to

rehabilitation and 2) there is bias in our tests. Identifying these factors is an important step in improving equity in aphasia care across different races.

Joshua McCall published a paper in *Journal of Cognitive Neuroscience* researching the brain areas that a person uses when they detect an error while talking. Specifically, we investigated the different brain regions relevant for different types of errors. The first type of error is when someone produces a word that sounds close, but is not quite right (phonological error). The second type of error is when someone produces a word that is similar in meaning to the word they meant to say (semantic error). We found that people



with motor speech deficits detect fewer phonological errors than semantic errors. We also found that people with auditory comprehension deficits detect semantic errors less often. These findings will help us further understand speech error monitoring and will allow us to better treat these deficits in people with aphasia.

*Brain regions involved in detecting phonological errors*

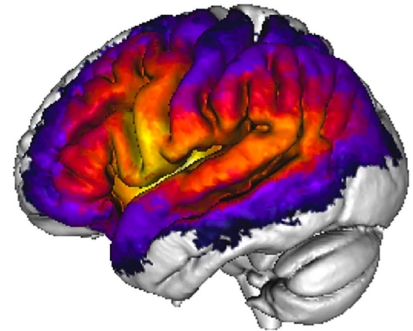
We also published a paper in collaboration with Dr. Brian Erickson at Drexel University in *Cortex*. Severity of aphasia is known to be related to damage to white matter connections. This study showed that connections that provide a “bypass” around a stroke are related to language abilities after a left hemisphere stroke.

We also published a paper in *Proceedings of the National Academy of Sciences* in collaboration with Dr. Elissa Newport here at Georgetown. We researched the common theory that younger brains are more capable of recovery and acquiring new information than adult brains. We found that people who had large left hemisphere strokes at the time of birth were able to process sentences and vocal emotion as well as other people. We also found that people who experienced strokes in the left hemisphere at birth used the right hemisphere for language. These findings help us understand developmental plasticity and the young brain’s ability to reorganize language. We hope that someday we can help adult stroke survivors by boosting plasticity so that language can reorganize like it does in babies.

All of this work is only possible with the help of participants, so we thank you for your contributions! Please email us at [crlab@georgetown.edu](mailto:crlab@georgetown.edu) if you have any questions or if you would like a copy of any of our publications.

## RECENT TALKS AND CONFERENCE PRESENTATIONS

- Andrew DeMarco, Candace van der Stelt, Chris Grisham, Kelly Martin, Sara Dyslin, and Tyler Ketchabaw presented research posters at the **Society for the Neurobiology of Language** in October 2022 in Philadelphia.
- Alycia Laks presented a poster at the **Academy of Aphasia Conference** in October 2022 in Philadelphia. The lab was busy in Philly this year!
- D. Seles Gadson was invited as a keynote speaker at the **Aphasia Awareness Fair** hosted by Temple University in October 2022. She was also invited to present her research on health disparities at the **American Speech-Language-Hearing Association Conference** in November 2022. Way to go, Seles!
- D. Seles Gadson was part of a round table discussion and Andrew DeMarco was on the program planning committee at the **Clinical Aphasiology Conference** in May 2023. Way to represent the lab!
- Dr. Turkeltaub presented on Aphasia Recovery at San Diego State University in April 2023.
- Dr. Turkeltaub was honored with the Susan Carter lectureship this year. He gave a lecture on medical care for people with aphasia at MedStar National Rehabilitation Hospital, and on brain plasticity at MedStar Georgetown University Hospital.
- Andrew DeMarco and Sara Dyslin presented posters at Human Brain Mapping in Montreal this July. We're excited to have international conferences again!



## TRAINING FUTURE LEADERS IN LANGUAGE RESEARCH

Dr. Turkeltaub also directs the Neuroscience of Language Training Program, which is funded by NIH. The program is now in its second year. This year, the program will support four PhD students and four postdoctoral fellows who are learning to do research on the brain basis of language. We hope to give these young researchers the opportunity to talk to people with aphasia and hear their stories. Let us know if you'd like to help!

## CURRENT STUDIES

As always, thank you to all of the people who have participated in our studies this past year! We cannot do our work without you.

### What is the **BUILD** study about?

Have you ever wondered why you recovered so well after your stroke? Have you wondered why you didn't recover as well as you'd hoped? Have you wondered why your strengths and weaknesses are so different from other stroke survivors you meet? In **BUILD**, we're studying whether these

individual differences are due to the nature of your stroke. We also want to understand how the strength of brain structures and connections that were not affected by your stroke impacts recovery. We hope that in the future, we will be able to predict who will recover well and who may need extra help after their stroke. We also hope that **BUILD** will guide us toward new targets for brain stimulation treatment. Participation requires a few sessions of behavioral testing and one MRI scan.

### What is the **ReadMap** study about?

Ever wondered how reading is affected as we age? Or after a stroke? Our new **ReadMap** study examines these questions. Our goal is to better understand the brain basis of reading abilities as we age and after stroke. Loss of reading ability after a stroke is called alexia. We hope that by studying reading in older adults and in those who have had a stroke, we will be able to improve diagnosis and treatment of alexia.

**Please call or e-mail Karina Diaz, MS, ([crlab@georgetown.edu](mailto:crlab@georgetown.edu), 202-687-5205) if you are interested in participating in **BUILD** or **ReadMap**.**

#### The **BUILD** Study

- Brain-based Understanding of Individual Language Differences after stroke
- 4-5 sessions of language, speech, and cognitive testing (at Georgetown or NRH)
- One MRI scan (at Georgetown)
- Receive a report with our observations about your language abilities and pictures of your brain

#### The **ReadMap** Study

- Reading after stroke and in typical aging
- 3-4 sessions of reading, cognitive, and language testing (at Georgetown or NRH)
- One optional MRI scan (at Georgetown)
- Receive a report with our observations about your reading abilities and pictures of your brain

Need to update your contact information with us? Let us know!

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