

The UofSC Aphasia Lab Newsletter

Research and Community News for People with Aphasia, Their Families
and the Rehabilitation Professionals Who Work with Them

Magnetic Resonance Imaging (MRI), the Champion of Brain Diagnostics

Samaneh Nemati, Doctoral Student

The brain is a very mysterious information processing system and people have always been interested in understanding how it works. It wasn't until the 1970s that a method was invented that allowed scientists to look inside the brain while it performed a certain task. That method is called Magnetic Resonance Imaging (MRI). Not only could scientists start answering fundamental questions about who we are and what makes us human, but they could also improve upon the diagnosis and therefore treatment of many neurological disorders. **How does the MRI scanner work?**

Magnetic Resonance Imaging is a safe and painless diagnostic method that uses a very powerful magnetic field, radio waves, a fast and powerful computer, and imaging software to produce high-resolution images to examine almost any part of the body including the brain. The basic principle of



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MRI is based on the fact that the nucleus of a hydrogen atom (part of what makes up water molecules) can act as a tiny magnet. About 70% of the human body is made up of water molecules. Normally, the water molecules inside us are arranged in random directions. But when we lie inside the MRI scanner, the strong magnetic field affects the water molecules inside us and causes them to line up in the same direction. We cannot feel it and it does not affect us in any way. Whenever water molecules spin around, they give off a slight pulse of energy in the form of a radio wave. The computer uses imaging software to perform millions of calculations to translate these radio signals into detailed black-and-white images. **What is that knocking?** One of the most frequently asked questions after an MRI scan is why the machine makes so much noise. The strong static magnetic field in the MRI machine is created by an electrical current running through a coiled wire. When the current is switched on to generate the image, the force on the coil is so intense that it causes it to expand, which makes a clicking or knocking sound. Depending on the frequency at which the magnetic fields are switched on and off, there can be different vibrations. Since the scanner is hollow inside, these sounds echo and become louder. People use different words to describe the sounds they hear which includes banging, clicking, whirring, clanging, and beeping. **What is MRI used for in the UofSC Aphasia Lab?** In the lab, we utilize different types of brain images collected by an MRI scanner to reveal underlying brain tissue damages in persons with different types of aphasia. In addition, we use language-related tasks in the MRI scanner (like a picture naming task) before and after treatment to explore treatment-induced brain changes in persons with chronic aphasia. This allows us to examine how specific treatments affect the neurobiology of recovery from chronic aphasia, and to understand which treatment works best for each type of aphasia. Understanding how different treatments influence the function and structure of the brain may lead to better selection of the treatment approach for each person which, in turn, may lead to more improvement in an individuals' ability to communicate.



The Aphasia Recovery Groups at UofSC

Anne Elise Nicoladis, Graduate Assistant

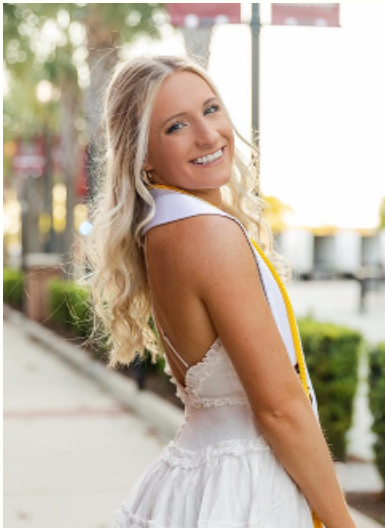
For 20 years, the Aphasia Lab and the UofSC Montgomery Speech-Language-Hearing Clinic have been hosting recovery groups for people with aphasia. These groups are led by students in the UofSC speech-language pathology program (under the supervision of certified speech-language pathologists), are open to our aphasia research participants free of charge, and are an opportunity for individuals to receive speech and language therapy in a fun and inviting group format. This summer, the student clinicians asked the group members how they felt about aphasia groups and this is what they said:



Welcome New Lab Members



Kristen DeJulio is a 2021 graduate of UofSC with a Bachelor's degree in Early Childhood Education. While she earned her degree in SC, she is originally from New York. She is honored to be continuing her education here in the COMD Master's program to fulfill her dream of becoming an SLP.



Leona Kelly is a graduate student in the Speech-Language Pathology program at the University of South Carolina. She is from Spartanburg, South Carolina, and received her undergraduate degree in Public Health from the UofSC. Leona aspires to work with children or adults with neurologically-based disorders in the hospital setting.



Lauren Owens is a graduate student in the University of South Carolina Speech-Language Pathology program. She is from Johnsonville, SC, and graduated from Francis Marion University with a B.A. in Mass Communication. Though she is excited to learn about all aspects of the field, she is interested in working with individuals with neurogenic disorders, specifically TBI's and strokes.

Welcome New Lab Members



Kristi Snow is a graduate student in the Speech-Language Pathology program at UofSC. She is from Alexandria, VA, and graduated from Clemson University with a B.A. in Communication. Kristi hopes to work with adults with neurological illnesses or injuries in the future and is excited to gain experience in the Aphasia Lab.



Kat Vlach is a graduate student in UofSC's Speech-Language Pathology program. She completed her undergraduate degree in Linguistics & French at UCLA. Kat hopes to work with stroke victims, helping them regain their speech, especially when it comes to phonetic articulation.



Joshua Hutto is an undergraduate student at the University of South Carolina Honors College majoring in Biological Sciences. Anticipating a May 2022 graduation, he hopes to attend a medical school and pursue a career in diagnostic radiology. Joshua enjoys traveling, is fluent in German, and holds both American and German citizenship. In his spare time, he enjoys playing guitar, motorcycling, piloting and aviation, SCUBA diving, and wrenching around on anything with an engine.

Current Aphasia Studies at the University of South Carolina



Study on Neural Bases of Vocal Sensorimotor Impairment in Aphasia

The Speech Neuroscience Lab at the University of South Carolina is looking for individuals with post-stroke aphasia to participate in a research study to help us learn about the brain mechanisms of speech production and their impairment following stroke.

Eligibility Criteria:

You may be eligible to participate if you:

- are between 21-80 years of age
- are diagnosed with aphasia due to chronic (> 6 months) left-hemisphere stroke
- are able to provide informed written or verbal consent
- have the ability to understand study instructions and speak

If you would like to learn more about this study, please contact:

Kimaya Sarmukadam, PhD

USC Speech Neuroscience Lab

803-777-9872

BrainLab@mailbox.sc.edu

Additionally, the Center for the Study of Aphasia Recovery at the UofSC is currently enrolling participants for two treatment studies, SpARc (Speech Entrainment for Aphasia Recovery) and TERRA (Telerehabilitation for Aphasia). If you or a family member with aphasia is interested in participating in SpARc, please contact Dr. Mary Aitchison at 803-777-5905 or mjaitchi@mailbox.sc.edu. If you or a family member with aphasia is interested in participating in TERRA, please contact Dr. Leigh Ann Spell at 803-777-2693 or SpellL@mailbox.sc.edu.

Care Partner Corner

Marsha Ryninger, Newsletter Editorial Board Member

When a person has a stroke and is diagnosed with Aphasia, the whole family is affected. This month's Care Partner Corner will spotlight **Elsie Graham** and her husband **Tom**, who know this truth and how they adapted.

Tell us your story. How did you become a caregiver/support partner for someone with aphasia? Tom had a stroke on August 24, 2016. I had never heard the term Aphasia until he was discharged from the hospital. I just knew he was having trouble finding words and talking. He also had open heart surgery on November 4, 2016.

What kind of changes took place in your lives as a result of your loved one having a stroke and aphasia? The biggest change was responsibilities, Tom always paid household bills and it became my responsibility.

What helped you and your loved one the most as you navigated your “new normal” after a stroke? With the help from our Church, family and friends.

What do you know now that you wished you had known right after your loved one had a stroke and aphasia? How to encourage (without making him feel bad) to attempt different things, and what I knew he could do.

How did you help other family members and friends understand aphasia and how it affected your loved one? Prayed (and cried), looked for information to share with others and encouraged them to talk to Tom and most of all be patient and let him find the words (this was hard for me at first).

What advice do you have for other caregivers/support partners of someone experiencing aphasia? The main thing is to be patient.



The UofSC Aphasia Lab

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What's Happening in the Aphasia Lab?

Keep up with the latest events in the lab, access free resources,
and get connected with others!

Follow us on Facebook

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and visit our website!

<https://web.asph.sc.edu/aphasia/>