The Spoken Word Language and Brain Lab Digest

2023



In this Issue

- 4 The Extraordinary Benefit of Friendship in Language Recovery After Stroke
- 6 | Living Life: Resilience and Adventure with Deidra Brown
- 8 Untangling a Speech Mystery: One Experiment at a Time
- $10 \mid \texttt{A Conversation}$ with Dr. Derek Houston
- $12 \mid \ensuremath{\texttt{Right}}$ or Left? Which Side of the Brain Tells Us Who is Talking?
- 14 Braided Science: Multiple Methods to Unravel Aphasia Therapies
- 16 Listening In: How Baby Talk Helps Infants Learn Speech
- 18 | A Peek Inside the LAB Lab: A Photo Essay
- $\mathbf{20} \mid \texttt{An Invitation to Participate in}_{\mathsf{Research}}$

Editor-in-chief, Design, Illustrations Hannah Mechtenberg

> Associate Editors Portia Washington Naomi Sellers Hannah Olson

Writers

Michelle Shavnya Lane Perkins Daniella Bryson Elizabeth Teskey Mikaela Puzzo Caitlyn Sodergren Kavita Srirangam

Principal Investigator of the LAB Lab Emily Myers



Note from the Editor

I am proud to introduce you to our eighth issue of *The Spoken Word*. Our modest research digest has a simple overarching goal: to bring research in speech and language sciences to non-scientists. We, the team behind *The Spoken Word*, believe that knowledge gained through experimentation and conversation belongs to everyone. Although researchers are excellent at communicating their findings to other experts, there are few pathways for that research to reach public audiences in accessible and engaging formats. We aim to change that.

Every academic year, a team of extraordinary undergraduate students (guided by a handful of graduate students) learn how to write for non-scientist audiences. They dissect popular science articles, choose topics, practice the skills of drafting and critquing, and ultimately work together to produce the articles that comprise this issue. The care that each student pours into *The Spoken Word* is remarkable, and I am grateful to have been a part of their science communication journey.

Each issue has a character of its own, shaped by student interest and recent research. The theme of this issue, with no guidance from me, emerged as one of studying speech and language in natural environments. For example, we have a story about learning how multiple talkers pronounce their speech sounds in unique ways—a task that we undertake every day. We also have an inspirational interview with Deidra Brown, a woman living with aphasia, who teaches us how to tackle adversity and to maintain life full of adventure. Together, these articles create a tapestry of hope and progress—all while moving out of the lab and into the world.

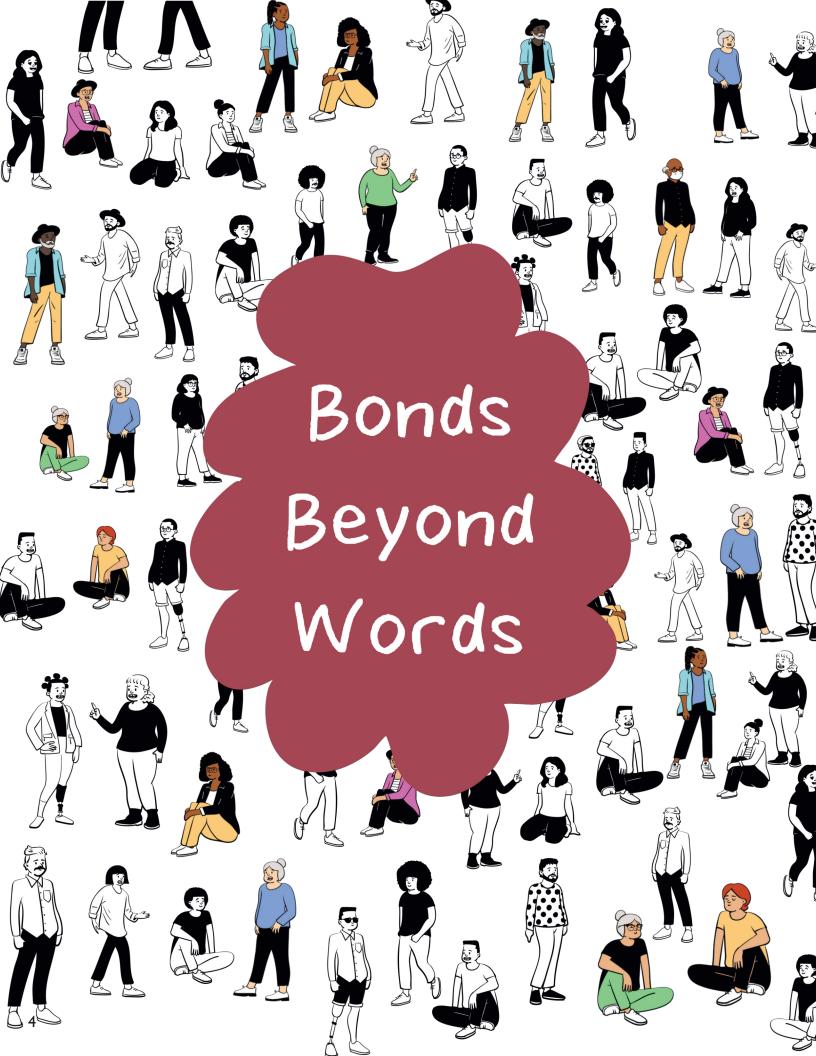
Beyond the writing, the art and illustrations seek to capture how science is done in all sorts of wonderful ways. I mixed digital doodles and photography and collages to create a diverse spread that is attention-grabbing and representative of the creativity inherent in each study and interview.

In all, this issue is one of our very best. We hope you enjoy flipping through each article and learning a little more about speech, language, and aphasia. The knowledge is yours and we are excited to deliver it to you.

Best,

Hannah Mechtenberg, Editor-in-chief and Creator of The Spoken Word

MMMMMM



The Extraordinary Benefit of Friendship in Language Recovery After Stroke

by Daniella Bryson

A phasia is a language disorder, often as a result of a stroke, that damages a person's language abilities. There are many different ways aphasia can present itself including jumbled or disjointed speech, difficulty finding words, and understanding what others are saying.

For instance, imagine picking up the phone to call a close friend to tell them about your hectic week. You dial their number, listen to the ringtone, and are thankful to hear them greet you. Your attempts to initiate conversation, however, aren't successful as you struggle to communicate your racing thoughts to your friend.

The connection between language difficulties and social well-being is exactly what researcher and clinician Natalie Douglas at Central Michigan University wanted to understand better.

Douglas and her team recognized that older adults (50 and older) tend to have weaker social networks, and that this is likely an even bigger problem for older adults with aphasia. From there, they conducted a meta-analysis to see what can be done to help those struggling with isolation later in life. A meta-analysis combines data published in other research articles and analyzes it all together.

The main purpose of this study was to find a way to alleviate the social isolation experienced by older adults by testing the effectiveness of friendship programs.

Through this analysis, the researchers found that most people reported a positive outcome due to the programs they participated in. These results included increased confidence and engagement, frequency of friendship contact, and other favorable effects.

Many types of programs were included in this study. Most were educational programs which included a reflection component that aimed to motivate participants to break out of their social comfort zones. Others were activity-based, mirroring activities that are used when individuals need rehabilitation. The third category was networking-based, such as peer befriending that supported participants as they navigated new friendships. But it's important to note that not all the participants in this study were people with aphasia. With that being said, Douglas believes that older people are a great population to learn from, despite that not every person with aphasia is an older adult. Researchers think, and hope, that these findings would be particularly beneficial to those who live with aphasia, as their social bonds have been impacted in a more drastic sense.

According to Douglas, it is essential to "learn some important lessons about some of the programming that's been done, so that we're able to start any programming that we might want to study further in the aphasia population."

So what does this mean? It means the best thing we can do to help those with aphasia is provide ongoing support relating to friendship maintenance. This includes holding onto friendships from before their language struggles started and promoting new friendship initiatives.

"Neuroplasticity is in your favor," said Douglas. Keeping our loved ones socially engaged is how we pull them out of the feelings of isolation and keep them sharp as they age.

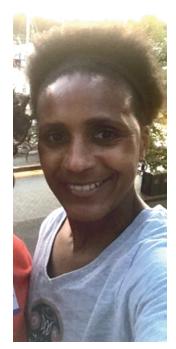
Source: Douglas, N. F., Archer, B., Azios, J. H., Strong, K. A., Simmons-Mackie, N., & Worrall, L. (2023). A scoping review of friendship intervention for older adults: Lessons for designing intervention for people with aphasia. Disability and Rehabilitation,45(18),3012–3031.https://doi.org/

Doodles by Pablo Stanley; CC0 License Stock photo from Pexels.com





Deidra Brown had two strokes in 2017. The first was a mild stroke that luckily didn't affect her greatly, but the second one left her with significant difficulty speaking. The right side of Brown's body was also weaker than it was beforehand. Despite these challenges, Brown never gave up as she worked to recover what she lost.



Deidra Brown Provided by Brown



Have you ever heard of the phrase, "tip of your tongue?" When you know what you're trying to say, but can't quite find the right words? There are people whose lives are like this all the time after they are diagnosed with a form of aphasia (a language disorder usually caused by traumatic injury to the brain) in which the person knows what they want to say, but they are often unable to produce the correct words or sentences.

The most common cause of this type of aphasia is when a person suffers damage, oftentimes due to a stroke, to an area of the brain vital for speech production. It wasn't until I met Deidra Brown, a two-time stroke survivor who was willing to share her story with me about her experience with aphasia, that I understood that all people with aphasia have a unique experience and outlook.

Immediately after her second stroke, the only word that Brown could say was "yes." No matter what anyone asked her, she would only say "yes," even though she had other things she wanted to say. She described this to me as being frustrating, but it never shook her conviction to get better. When I asked her what she would say to the entire aphasia community, she said to "Keep practicing. Practice, practice, practice. Don't give up and take your time with it."

That's what she did. Brown joined multiple aphasia support groups, some filled with people also living in Washington DC, and others with people from all over the world.

She said that, **"Talking to [other] people with** aphasia helps to know that you're not alone, and that you take your time with each other."

An important part of communicating with someone with aphasia is patience. Others may find

this frustrating, but Brown says that "if you don't like it, then that's okay. Because this is me."

This was one of the things I respected about Brown; she did not let her aphasia or strokes define her. In her free time, Brown goes to her local community center where they host different types of adaptive outdoor activities. She has participated in adaptive indoor rock climbing, bike riding, kayaking, and more. She feels grateful that her area helps make these types of activities accessible so she is able to partake. **"People with disabilities still want to get out and do things they did before. Let us get out of the house and do fun things!"**

After speaking with her, I asked Brown how we can help bring awareness to aphasia and what we could do to help. Brown just asked people to be patient with her and others with aphasia. She understands the frustration with communication and the difficulties people around her may face when they talk to her, but patience is the one thing that will make aphasia patients feel appreciated.

As someone who has had full access to speech and language all my life, seeing Brown's consistent work and effort that she gives to recover has given me a completely new understanding of what it meant to live life with aphasia. However, I do believe that Deidra Brown's strong personality and inspiring resilience can serve as an inspiration for those currently living with aphasia.

She has shown time and again the beauty of living life as is, no matter the hardship, and being confident in yourself and your abilities, a lesson I believe anyone in the world would appreciate.

Stock photo from Pexels.com



Interview and Story by **Kavita Srirangam**

, with assistant direc-3 ra, musical director 2 n, and c'-d. , z. J. Qr.

ing.a.

ringino

emble.

HARMA COCIETY CUNTER AL Dositive Society Contest and State following the following E DOSITIVE COMPL S' Idept intont SOF LIL 's Daim https://w nore icut A ans-eve 8 Day R all 860 he Windso dubon. -WS ranchare nore ini Ilans place ram illust SOFTE .r ditio This " " art, F rici 4 ies an Vinc guage, custo, custo, guage, w the impacts their life and w the The audience is tems herti sauce & ad meats.

Y Crescent St. Wh

into

a salk t

an intent or applicatio

ext or call 860-423-6.

Pomír t

PONT 'ET-TI

windh



Untangling a Speech Mystery

ONE EXPERIMENT AT A TIME by Lane Perkins

Have you ever met someone new and found it difficult to have a conversation with them at first? As we get to know someone, our conversations with one another become much easier, but why?

One idea researchers have is that we learn in a very specific way how a particular person speaks. People have unique quirks in aspects of their speech, like in pronunciation, and we are able to pick up on those. We are constantly learning and updating what we know about voices for different people in our everyday conversations.

Recently, a group of researchers from the University of Connecticut discovered that doing this kind of learning can be quite difficult when you are trying to learn the ways two different people talk at the same time. In fact, we often need to listen to each talker's voice quite a bit to learn about it.

Back in 2021, Sahil Luthra, Hannah Mechtenberg, and Emily Myers tested whether people could learn two other peoples' unique pronunciations at the same time.

They had people listen to one male- and one female-sounding voice say a set of 32 words each. While listening, they had to decide whether they thought the talker sounded male or female. Separate groups of people performed slightly different versions of this task, one where they were told if they were right or wrong, and one where they were given no feedback.

When the data were analyzed there was no indication, for either task, that people were learning anything about each individual talker.

Mechtenberg noted that she and other researchers were surprised by these results, saying, "they were interesting and not what we expected." The good news is that the story doesn't end here. They took the same task and doubled the number of times that people listened to each talker. This time, people heard each talker say a set of 64 words, instead of just 32. Under these conditions the researchers finally observed a learning effect.

Repetition (hearing each talker twice) helps us learn the differences in the talkers' quirks. It may sound difficult, but it is possible for the brain to simultaneously comprehend the quirks in both talkers' speech. It can even do this kind of learning after listening to only 64 words! The brain struggles to learn, however, when it has a limited amount of evidence that these talkers pronounce sounds a little differently.

The results of this study tell us that learning and listening become easier when we are able to hear something more than once.

"We wanted to validate that people can learn," said Mechtenberg.

Understanding how we learn about people's particular way of speaking can be useful to keep in mind, especially when you meet new people for the first time. It is important to note that when it comes to learning voices, practice makes perfect (or at least easier).

It will not always go smoothly the first time. Maybe you have a family member or a friend who has been sick or had a recent trauma that affected their voice. It could even be as simple as meeting a new teacher or working with a new supervisor.

We may struggle a bit with listening and understanding others at first, but the more conversations we have with them, the easier it becomes!

Source: Luthra, S., Mechtenberg, H., & Myers, E. B. (2021). Perceptual learning of multiple talkers requires additional exposure. Attention, Perception, & Psychophysics, 83(5), 2217–2228. https://doi.org/10.3758/s13414-021-02261-w

a conversation with DEREK HOUSTON, PhD



Interview and Story by **Caitlyn Sodergren**

Derek Houston is the new head of the Speech, Language, and Hearing Sciences department here at the University of Connecticut (UConn) as of fall 2022. This is his first year as department head, and he brings years of experience and deep knowledge of the field. Houston received his PhD in cognitive psychology. He then dedicated many years to conducting research on the speech perception of deaf or hard-of-hearing children with cochlear implants. I sat down with Houston to learn more about where he started and how his career led him to Connecticut.



Derek Houston. Provided by Houston



I first asked him what sparked his interest in studying how children with cochlear implants [an electronic hearing device that helps people with nerve damage by sending electrical signals to the nerves in the inner ear] process spoken language:

"When I was in high school, I met a neurologist that did research on and treated people with aphasia. That sparked my interest in language and language disorders, and I had an opportunity to work in his lab in the summer. Most of the stuff went over my head, but I thought maybe if I learned how language is developed, then I could understand these language processes better. Once I started taking classes in language development, I realized there is very little known about language and language development. That [language development] became my main interest.

Towards the end of my PhD, I learned that there was a postdoctoral fellowship position opening up, and they were interested in studying speech perception in young children with cochlear implants. When I thought about it, I realized that I had barely even heard of a cochlear implant because this was in 1999. I realized, wow you have these deaf infants and now they're going to have access to sound. All the work I was doing as a PhD student was about studying all of the developmental changes in speech perception during the first year of life. So this idea that they basically couldn't have any of these processes happen during the first year of life and that they would happen after the cochlear implant was an exciting puzzle."

Houston created the first lab to investigate the speech perception and language skills of deaf infants with cochlear implants. He worked closely with families with children who were deaf and had cochlear implants, and I couldn't help but think about everything he has learned from seeing the world from the perspective of these children and families. I asked Houston whether his experiences with these families changed how he views the world and what he wishes more people would know about these unique situations:

"When you say that, I think of a parent at a talk I went to. The parent talked about the shock of finding out she has a baby who is deaf. She used an analogy: it's like you're planning a trip to London but then you actually end up going to Paris. It's not really any better or worse. Every person is born with their own set of challenges and opportunities. As a parent, no matter what child you have, you have challenges and opportunities. There is a whole lot more to a child than whether or not they can hear."

After learning about his past, I asked about how scientists and nonscientists can work together to create a better future in the speech, language, and hearing sciences world:

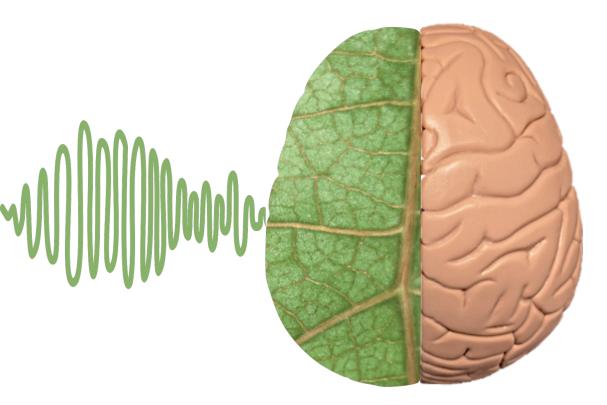
"I think that we, as humans, evolved to coordinate and cooperate. The more that we take the time to understand where the clinicians and providers are coming from and what the patient and client perspectives are, that will make the world a better place. The activity of getting together to solve problems is what would make the world a better place more so than the answers themselves. The process is the solution."

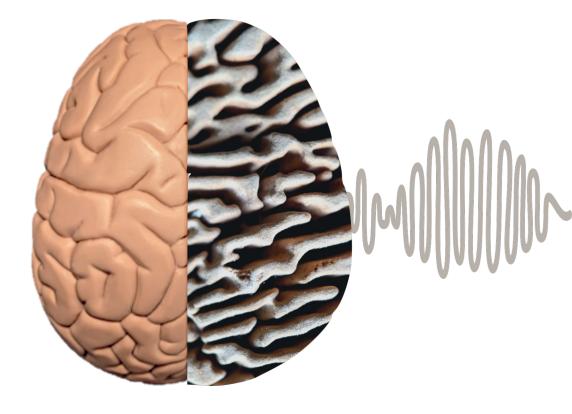
(LEFT) the sign in front of the Phillips Building on UConn's South Campus. This building hosts the Speech and Hearing Clinic, lab spaces, and the Brain Imaging Research Center.

(RIGHT) the entrance to the Phillips Building.

Photographs by Hannah Mechtenberg







Right or Left?

by Elizabeth Teskey

You hear two voices in a dark room. One is your best friend and the other is a complete stranger. Could you tell them apart by voice alone? Of course you could! For most people, it's second nature to recognize the voices of your friends and family members. However, your brain has to do a lot of work to distinguish between multiple voices.

In this process of sorting out whose voice belongs to who, both the right and left side of the brain are activated. Evidence from a 2023 study by Sahil Luthra (a Language and Brain Lab PhD graduate) found that the right side of the brain was active when determining who was talking, whereas the left side plays a bigger role in making sense of the content of what is being said.

We know a lot more about how the left side of the brain processes spoken language, while there is a lot less known about what the right side contributes to language processing. So, why is it so important to figure out what the right hemisphere of the brain is doing?

According to Luthra, the people who come into speech and hearing clinics to receive care are "mostly people with left hemisphere damage who have pronounced difficulty in speech comprehension (understanding speech) or speech production (speaking)."

Only studying the function of the left hemisphere significantly limits our overall understanding of language processing, and therefore limits potential treatment methods for people with damage to the right hemisphere that results in language difficulties.

To help move research in the right direction, the functions of the right side of the brain must be distinguished from the functions of the left. One method, using an MRI machine, allows scientists to peek inside the skull and see how different areas of the brain respond to speech. Researchers can ask people to complete multiple tasks, like identifying celebrity voices, listening to speech versus nonspeech sounds (like laughter!), and naming celebrities and famous places from photographs. ONE STEP CLOSER TO FIGURING OUT WHICH SIDE OF THE BRAIN TELLS US WHO IS TALKING

A study by Katharina Von Kriegstein and Anne-Lise Giraud in 2004 had participants listen to the speech of someone they knew well and someone who they were less familiar with. After each trial, people answered questions about what they heard and who was talking to determine what area of the brain lit up for each type of information. Like Luthra, they found that the right hemisphere cared more about the identity of the person talking and less about what they were saying.

Understanding the different roles that each side of the brain takes opens up the potential for patients to receive optimized treatment plans that are specifically designed for them. Although it is too soon to develop treatment plans for right hemisphere damage, this work paves the way for future research and, eventually, targeted interventions.

"We (researchers) don't go out of our way to recruit people with right hemisphere damage or assume that anything is wrong with the speech comprehension system [in the right hemisphere]. But the idea that there might be really subtle things [going on] is worth following up on just to make sure we can give people the best treatment," said Luthra.



Science in action: Dr. Sahil Luthra (right) and Hannah Mechtenberg (left) take a photo as they run a participant in a study that uses electromagnetic pulses to temporarily "turn off" a brain region. This was a follow-up study to the one reported here. Photographs by Hannah Mechtenberg

Source: Luthra, S., Magnuson, J. S., & Myers, E. B. (2023). Right Posterior Temporal Cortex Supports Integration of Phonetic and Talker Information. Neurobiology of Language, 4(1), 145–177. https://doi.org/10.1162/nol a 00091

Source: Kriegstein, K. V., & Giraud, A.-L. (2004). Distinct functional substrates along the right superior temporal sulcus for the processing of voices. NeuroImage, 22(2), 948–955. https://doi.org/10.1016/j.neuroimage.2004.02.020

Braided Science: Multiple Methods Aphasia Therapies

Learning about effective aphasia treatments is invaluable for people with aphasia and their caregivers, but the complex writing style of many journal articles can prevent the general public from understanding research findings. In this article, we aim to share results from two recent studies on aphasia treatment in a more accessible way. Examining these two studies also showcases the diversity of aphasia research in terms of scale and methodology.

The first study, led by Miranda Rose at La Trobe University in Australia, was conducted between 2016 and 2020 and involved 216 participants in Australia and New Zealand. Rose started her career as a clinician, but after some time she realized addressing gaps in existing research would have the broadest impact.

One gap was about developing, and testing the effectiveness of, intensive aphasia treatments using various communication types like writing, reading, gestures, drawing, and talking. In Rose's study, she compared the outcomes for three different therapies: **an intensive talking therapy (Constraint-Induced Aphasia Therapy-Plus)**, **an intensive multimodal therapy (Multi-Modality Aphasia Therapy)**, **and usual care (low dose, low-intensity therapy)**.

Every person with aphasia who participated was randomly assigned to receive one of these therapies, meaning that about 70 individuals received each type.

Which treatment was most effective? **Rose explained that both of the intensive therapies worked.** Clinicians and consumers can have confidence in Constraint-Induced Aphasia Therapy-Plus and Multi-Modality Aphasia Therapy.

Results suggest that if, on average, a person does 30 hours of Constraint-Induced Aphasia Therapy-Plus or Multi-Modality Aphasia Therapy over two weeks, they should see significant improvements in word finding, expressing wants and needs, and general quality of life. Also, those with severe or mild aphasia tended to do well with Multi-Modality Aphasia Therapy, while those with moderate aphasia tended to do well with Constraint-Induced Aphasia Therapy-Plus; a distinction that Rose would like to investigate further.

The other study, completed by Jennifer Mozeiko and two graduate students at the University of Connecticut, studied only two people: one who participated in 2015 and another who participated in 2019. Mozeiko initially became intrigued by aphasia after learning about the brain's ability to change after injury. Now, the science behind aphasia treatments and working closely with patients motivates her. Because there is little research examining outcomes for people with severe aphasia, she wanted to explore the topic further.

She and her graduate students implemented a set of aphasia therapy guidelines originally developed by Hildred Schuell, a speech-language pathologist who worked in the 1960s. Their study tracked changes in the communication skills of two people with severe aphasia.

to Unravel

by Michelle Shavnya

How did their communication abilities change? Mozeiko said that the improvements were "a little subtle and hard to characterize, but they both made big changes that improved their quality of life." For instance, one family member told her that their loved one seemed "more plugged in and understanding more about what was going on." Mozeiko also highlighted that people close to the two aphasia patients noticed positive changes in their loved one's communication skills.

Both researchers–Rose and Mozeiko–have important messages for people with aphasia and their caregivers that go beyond the specific results of their work. Rose focuses on the hope that her research has generated. She says "it takes effort and a therapeutic environment where people know what they're doing, but it's a very positive take on the brain's ability to reorganize and respond to specific interventions." Similarly, Mozeiko stresses how far diligence can go even in chronic or severe aphasia, and how families can promote further progress by **"researching communication partner strategies and using them regularly,**

encouraging being part of an existing social network, and making the environment more conducive to having a conversation."

Both Rose and Mozeiko express their utmost gratitude to the people who participate in their studies and help to contribute to a better world for people with aphasia.

Source: Rose, M. L., Nickels, L., Copland, D., Togher, L., Godecke, E., Meinzer, M., Rai, T., Cadilhac, D. A., Kim, J., Hurley, M., Foster, A., Carragher, M., Wilcox, C., Pierce, J. E., & Steel, G. (2022). Results of the COMPARE trial of Constraint-induced or Multimodality Aphasia Therapy compared with usual care in chronic post-stroke aphasia. Journal of Neurology, Neurosurgery & Psychiatry, 93(6), 573–581. https:// doi.org/10.1136/jnnp-2021-328422

Source: Marsalisi, C. A., Hughes, S., & Mozeiko, J. (2023). The Therapeutic Effect of Schuell's Stimulation Approach for Severe Chronic Aphasia. Aphasiology, 37(9), 1427– 1455. https://doi.org/10.1080/02687038.2022.2096206

Source: Pierce, J. E., O, 'Halloran Robyn, Togher, L., & Rose, M. L. (2019). What Is Meant by "Multimodal Therapy" for Aphasia? American Journal of Speech-Language Pathology, 28(2), 706–716. https://doi.org/10.1044/2018_AJSLP-18-0157

Photograph (left) by Hannah Mechtenberg

A Closer Look at the Methods

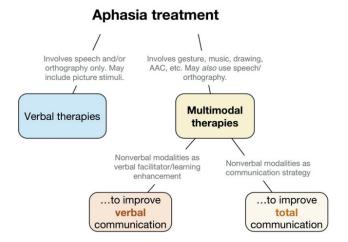
Randomized control trial (Rose's study)

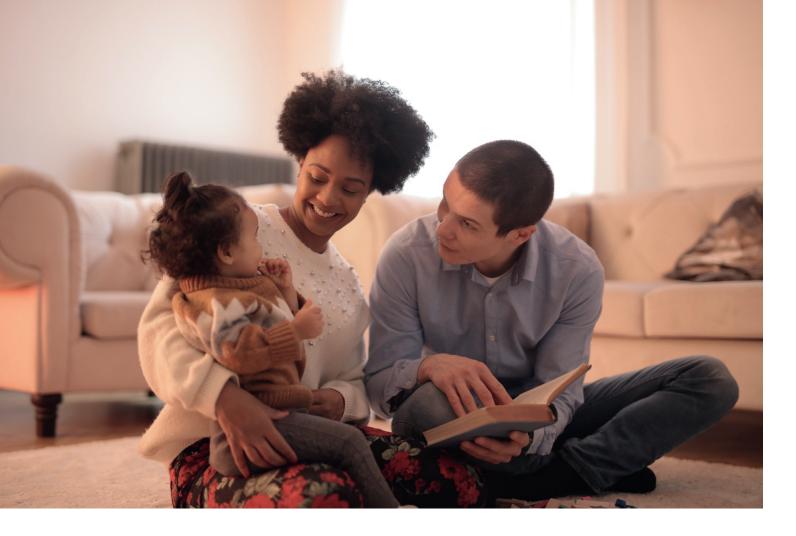
A randomized control trial randomly assigns people to different types of treatments with the goal of determining which treatment, if any, causes the greatest improvement. Although determining causality is useful, studies with this design are often not feasible in the field of communication disorders. It is difficult to find enough participants and the amount of time and funding needed is a significant barrier. Additionally, because the results only take the "average" result, it is difficult to examine what led specific people to perform better or worse.

Single-subject multiple baseline (Mozeiko's study)

A single-subject multiple baseline compares each person's performance against themselves throughout treatment, with the goal of measuring steady improvement as treatment continues. This approach is used when relatively few people fit the criteria a researcher wants to explore or when researchers want detailed information about a particular person. However, the lack of broad findings makes generalization to other people challenging. Also, although examining a few participants at a time seems easier, researchers must still work very hard to ensure treatment is delivered consistently at all times and with each person.

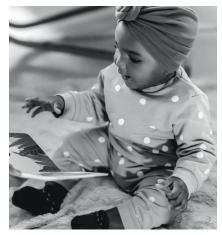
Helpful graphic showing aphasia treatment types – taken from another article by Miranda Rose! https://pubs.asha.org/doi/10.1044/2018_AJSLP-18-0157





LISTENING IN HOW BABY TALK HELPS INFANTS LEARN SPEECH

by Mikaela Puzzo



All stock photos from Pexels.com

Have you noticed that when people talk to babies, they tend to exaggerate and use a singsong-like voice? This speaking style is used when talking to babies and is called infant-directed speech.

Infant-directed speech is clearer than speech we use when talking to other adults, as it has longer vowels and greater enunciation (e.g., 'Hiii babyyyy'). Researchers wonder if this style of speaking helps babies learn language by giving them a clear model of their native language.

As a bilingual parent, Adrian Garcia-Sierra (a researcher at the University of Connecticut) wondered if his accent affected the quality of his infant-directed speech, and thus his children's language learning. He explained that high-quality infant-directed speech has long, exaggerated vowels and exaggerated enunciation. Both of these qualities together make speech overall more clear.

In 2021, Garcia-Sierra decided to run a study and found that highquality infant-directed speech helps babies learn their language.



In the study, parents wore a recording device while talking to their Spanish-English learning babies. Garcia-Sierra was especially interested in capturing the length of vowels (e.g., vowels "ooo" and "ah") produced by parents while talking and reading to their babies at home and while reading to them in the lab. Then, the babies listened to speech sounds in the lab that were created to resemble the type of speech we use when talking to other adults (not as long vowels or exaggerated enunciation).

The speech sounds played to the babies were either: two sounds that were meaningfully different in their native language (but not different in an unfamiliar language) or two sounds that were meaningfully different in an unfamilar language (but not different in their native language). For example, /da/ and /ta/ are heard as distinct sounds in Spanish and English, but not in Chinese.

Garcia-Sierra used an electroencephalogram (EEG) to look for a specific brain response while the babies listened to the familiar and unfamiliar speech sounds. The EEG is a tool that uses electrodes placed on the scalp to measure the brain's activity.

Garcia-Sierra used the EEG recording to pick out a specific brain response that indicates that the baby is paying attention to the sounds, and is building routines in their mind to process the language.

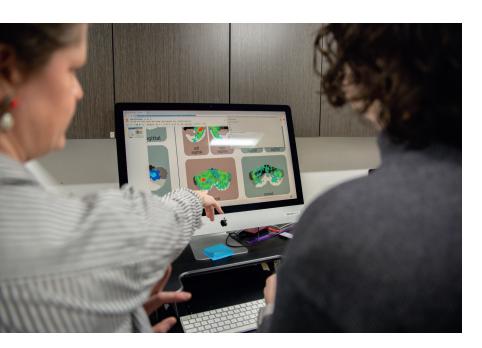
Garcia-Sierra explained these routines using a tennis analogy. When you first learn to play tennis, you're thinking about the moves you need to make to execute specific shots. The more you practice, the more these movements become automatic. Similarly, when learning a language, we build routines in our minds to help us process it. Eventually, these processes become natural so that no effort is required for us to understand our language.

While the infants' brains showed responses to both familiar and unfamiliar speech, the EEG recording showed that there was more brain activity in response to familiar sounds. Interestingly, the quality of the infant-directed speech (that came directly from parents) was only related to brain responses to the native sounds. This means that high-quality infant-directed speech may help babies pay attention to speech sounds in their native language, helping them build the routines needed for learning their language.

So help babies learn language by talking to them with looooong voweeeeeells!

Source: García-Sierra, A., Ramírez-Esparza, N., Wig, N., & Robertson, D. (2021). Language learning as a function of infant directed speech (IDS) in Spanish: Testing neural commitment using the positive-MMR. Brain and Language, 212, 104890. https://doi.org/10.1016/j.bandl.2020.104890

A peek inside... the Language a



Before our science appears in print, we have many discussions about possible interpretations of the data. The **above** photo captures a conversation about patterns in brain activity for an unpublished study about the cerebellum. The photo on the **right** shows how we create statistical models that help us describe the data we observed (and determine if what we measured is meaningful or not).

Building Model Briess TD ~ for Sir Sir (DV) by ... IV expanded 0 ID ~ time (does ID S) ID ~ time (does ID Is M2 better than MI? Eg.) R² = .50, R² = .5 M2 vs. M3 M(213) Vs. M4



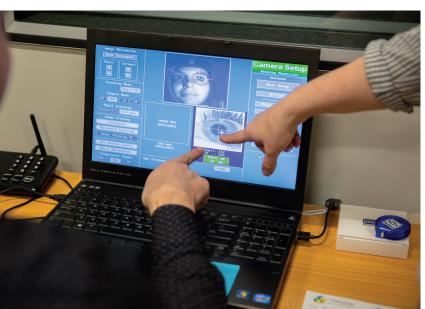
The eyes as windows into the mind.

The **near right** photo shows the control screen for our in-lab eyetracker (fancy infrared camera). This screen allows us to change the camera settings and make sure that the camera is centered on a person's right eye.

The **far right** photo shows the eyetracker capturing a participant's eye while we stabilize their heads. Eyetracking can tell us how the pupil changes size when listening to speech and can also track gaze direction.P Both methods give us insight into the mind when listening to spoken sentences and words!

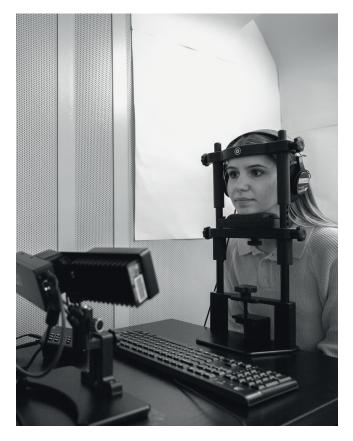
nd Brain Lab





In the LAB Lab, we prioritize personal connection and well-being.

Science is made for and by people. We LAB Labbers work hard to create a lab atmosphere that is friendly, collaborative, and inviting for everyone! We maintain a team of superb undergraduate research assistants that help the lab function as they learn the ins and outs of speech and language science. We use a highly interconnected mentorship model so that everyone (from the head of the lab all the way to our newest research assistant) has the opportunity to learn from all other lab members. Questions are always welcome! Our lab ethos is photographed at **left**.



All photographs by Bri Diaz/UConn Photo

This issue is brought to you by the:



follow us on Twitter: @UConnLABLab

Have feedback or want to pitch a story that should be in the next issue? **Email us at: uconnmyerslab@gmail.com**

Interested in participating in language research?

At the UConn Language and Brain Lab, we're always looking for participants (age 18 and over). We're making a list of adults who may be interested in participating in our studies in the future. **We are also looking for adults with aphasia** who are interested in participating in our studies!

You can sign up to be contacted about future studies by completing a brief survey on our website or contacting us directly.

There is no payment for completing the survey, but you may qualify for future studies that compensate between \$15 and \$30 an hour.

TO FIND OUT MORE: Visit our website: myerslab.uconn.edu Contact us at: 860-486-0931 or uconnmyerslab@gmail.com



Follow to survey and more information