An idling truck, a sputtering lawnmower, a buzzing leaf blower on a distant lawn, the chatter of café conversation, a cellphone notification. These sounds don't damage our ears, yet they should concern us for the sake of our brains.

Chronic noise requires our hearing to be always “on,” leaving our brains fatigued and dulling our perceptions. We become less able to detect the sounds we want to hear and the subtle timing cues we need to understand speech. During this holiday season, let us notice the sound all around us and turn down the noise. Let's make room for the sounds that nurture our brains and feed our souls, like music and conversation with family and friends.

Nina
Trent Nicol, Jennifer Krizman, Silvia Bonacina, Anoop B. J., Chaitra V., Jacob Farley, Jenna Cunningham, Charlie Culbert
Joseph Luetkehans, Courtney Baker, Benjamin Livingston, Nicole Balassone, Anika Kaushikkar, Carl Youel, Maggie Powers, Rachel Kim, Lane Herbert, Brooke Sawyer, Macy Hoeveler

Artist collaborator: Katie Shelly
Of Sound Mind
Now in paperback and translated into six languages, OF SOUND MIND: How Our Brain Constructs a Meaningful Sonic World tells the story of how sound impacts our lives and shapes who we are. It received the PROSE award in Biomedicine from the Association of American Publishers and the NAUTILUS GOLD Award in Science and Cosmology. This is a story about the power of sound and the biological reasons for us to make good choices in education, medicine, and our personal lives.

Sound Embodies Betweenness
In his recent book The Matter with Things, Iain McGilchrist writes about his view of the world. He combines philosophy, medicine, the sacred, and physics. Iain believes that we overvalue individual things and undervalue the relationships between them. If you’re interested in peering into Nina’s scientific heart, have a listen to the conversation Iain and Nina shared recently.
https://youtu.be/IsMmvuxfhiM

Frequency Following Response Workshop
After two years of pandemic restrictions, we traveled to Barcelona to the International FFR workshop hosted by Carles Escera at Brainlab (Universidad de Barcelona). The workshop brought the growing research community together to talk about the origins and interpretation of this response, discuss recording and analyses, and new directions in this expanding field. Join us in 2024 when Northwestern University hosts the next edition of this workshop.

We got to be with colleagues from around the globe and reunite with Brainvolts alumni.
Our Life in Sound
BBC filmmakers of the docu-series How to Live to 101, traveled to Brainvolts for their upcoming episode, “Aging and Senses.” Eighty-seven-year-old Bobby Lewis has had a rich life in sound. As a jazz musician for over 50 years, his hearing brain benefits from his experience with the rhythm and timing of music, yet as a war veteran, the sounds of explosions damaged his hearing. Nevertheless, his biological response to sound is uncommonly robust. Bobby epitomizes how the hearing brain interacts with what we know, with our emotions, with how we think, with our movements, and with our other senses.

We Hear with Our Brain
Following total loss of hearing due to neurofibromatosis, Matt Hay received a brainstem implant which delivers sound signals directly to his brain. Most people recover little more than the awareness of sound following this surgery, but Matt has outstanding hearing abilities. Matt and Nina shared rich conversations even in challenging listening circumstances. Matt attributes his remarkable hearing to auditory training. He designed his own training program using music to re-train his brain. Years later, he found audiologist Angela Alexander whose training methods gave him enormous help to hear speech sounds. Our ongoing engagement with people with hearing loss strengthens the view that hearing is a holistic experience and that music can provide a little-recognized form of auditory training.

Learning about Concussion using Rhythm
Jacob Farley works closely with Dr. Cynthia LaBella, head of the Lurie Children’s Hospital Institute for Sports Medicine. Jacob has done a great job collecting data and recruiting participants this year. We continue to assess the impact of concussion on children’s auditory processing in analyses led by Silvia Bonacina. Specific attention has focused on the neural processing of sound and listening in noise. We have discovered that concussion disrupts rhythm skills. We are looking into how digital music medicine can speed concussion recovery.

Dartmouth Update
In collaboration with the Space Medicine Innovations Lab at Dartmouth, headed by astronaut Jay Buckey and the Muhimbili University of Health and Allied Sciences in Dar Es Salaam Tanzania, we
found hearing disruption in young adults living with HIV. We con-
tinue to monitor these individuals as they age. Niemczak, 2022, 
Otolaryngology-Head and Neck Surgery

Athlete Update
Our Big 10 collegiate student-athletes re-
sumed a full competitive schedule. Like-
wise, we ramped up our data collection 
for our NIH-funded longitudinal study ex-
amining the effects of sports-related con-
cussion and participation in contact and 
collision sports. To date, Brainvolts has 
conducted over 3500 testing sessions.

We continue to learn how playing a sport 
can benefit sensory perception. Athletes have 
quieter, that is to say less noisy, brains than non-athletes. 
This enables better connection with their sur-
roundings. Athletic activity also enhances neural encoding of cer-
tain aspects of sound, especially in female athletes. 
Krizman, 2022, Scientific Reports

While sports participation benefits our health, we have discov-
ered that a concussion can harm the hearing brain. Moreover, 
even without an overt head injury, seemingly healthy athletes 
who play sports with the most contact demonstrate disrupted 
sound processing. Kraus, 2022, submitted

Accented Speech
Jen, through her NIH R-21 grant, is studying how sound 
processing differs in native and non-native lis-
teners, especially in difficult listening environments.

We are looking for English monolinguals with hear-
ing loss, Chinese-English bilinguals, and Spanish-
English bilinguals (ages 30-55 years old). If you are 
interested in participating, please contact us at brainvolts@gmail.com.

Music and Hearing Loss
Postdoctoral fellow Anoop won a grant from the American Hearing Research Foundation to inves-
tigate neural activity evoked by musical notes, with a focus on people with hearing loss. In addition 
to traditional analyses, brain responses will be made audible, providing another dimension to as-
sess what hearing loss does to sound processing.
Alumnae Award

Northwestern University honored Nina as the 46th recipient of the Outstanding Alumnae Award. She told those assembled, “this award is not about me. It honors the work we do—sound touches everything we care about — and the people who do it.”

Welcomes

We are thrilled to welcome extraordinary sound man Charlie Culbert. As a musician, recording engineer and sound artist, he is helping us make brain responses audible so we can listen to how different people hear the world. By measuring a specific brain’s response to individual notes, we can assign them to a keyboard to ‘play’ that person’s brain.

We are proud to be partnering with Northwestern University Athletic Trainer and Concussion Care Specialist Matt Nerrie to study the hearing brain of our athletes.

Send offs

We miss Rembrandt Otto-Meyer terribly. He now works as an Operations Analyst at Montaro, providing insights to premium brands in San Francisco.

Danielle Colegrove, a longtime member of the NU Sports Medicine staff, has been promoted to Associate Athletic Director at UIC. We look forward to continuing collaborations.
On a Different Note

Nina has been promoted to “Nonna Nina.” Young Julian is at least as interested in sound as she is. He made his first trip to Trieste this summer and took in the magical silence and sounds of the woods he hiked with his Nonna... well, cradled in his front-carrier.

More Marathons

Jen is training for her next race in January at Disneyworld, where she will complete a 5K, 10K, half-marathon, and full-marathon on successive days. She recently completed the Disney Wine and Dine Challenge, running a 10K and a half marathon on back-to-back days.

Farm Life

Trent’s home front has expanded with more “kids.” Once again, he welcomed a set of fraternal twins. This time, goats!

Partner with Us

One hundred percent of our research is funded by outside sources, federal and private. If you would like to help us accelerate our work, please click the link to donate.

https://bit.ly/3dsToWW

Also write to us at brainvoltspartners@gmail.com to discuss how we can work together.
Visit us online!
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