

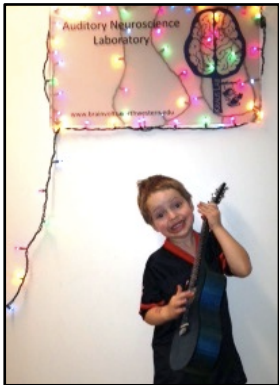
Auditory Neuroscience Laboratory

www.brainvolts.northwestern.edu

Discovering early markers of language development by studying brain activity, listening, and learning



Season's Greetings & Happy New Year!



Happy holidays! We can't believe that another year of BIoTots has come and gone, and we can't wait to start seeing families—many for the *fourth consecutive year*—in January.

It has been a wonderful year for the study. The BIoTots were just featured in WNYC's *Only Human* podcast, following a feature in NPR's *Morning Edition* last summer. This fall, the American Academy of Pediatrics also took note of the BIoTots study and our work on neural markers of early reading skills.

We're delighted to let you know that a new paper from the BIoTots study has just been accepted for publication by *Developmental Cognitive Neuroscience*. Kali, Adam, Travis, and Nina found that BIoTots who are better at keeping a steady drumming beat have more stable brain responses to sound. This is an important finding because both steady beat-keeping and neural stability tracks with literacy skills.

The entire BIoTots team wishes you and your family a happy holiday season and relaxing New Year. We look forward to seeing you in 2016. Oh, and come January we're unveiling a new t-shirt! Can't wait for you to see it on your next visit to the lab.

The Biotots research team

Researcher Spotlight:



Silvia Bonacina
Research Assistant

Silvia's interests are in the early foundations of literacy and language, their links to musical skills, and the brain mechanisms underlying these phenomena. Silvia also wishes to develop music-based interventions to support language development.

She recently completed a master's degree in developmental and communication psychology at the Università Cattolica del Sacro Cuore in Milan, Italy. Silvia also studied music therapy before coming to the States. She investigated the impact of rhythmic training on literacy skills in children with dyslexia, and her manuscript "Improving reading skills in students with dyslexia: The efficacy of a sublexical training with rhythmic background" was just published in *Frontiers in Psychology*.

Silvia is originally from Lecco, a town in northern Italy on Lake Como, and now lives with her husband in Evanston. While she enjoys living in the States, she is still trying to adapt to American coffee.

We hope you had fun playing with us!

If you have any questions about the project or would like to share photos of your child with us, please call or email: (847) 491-2457 biototsresearch@gmail.com

Did you know that Northwestern has a communication clinic?

The *Center for Audiology, Speech, Language, and Learning* provides care to patients across the lifespan, and is located just across the street from the Auditory Neuroscience Lab!

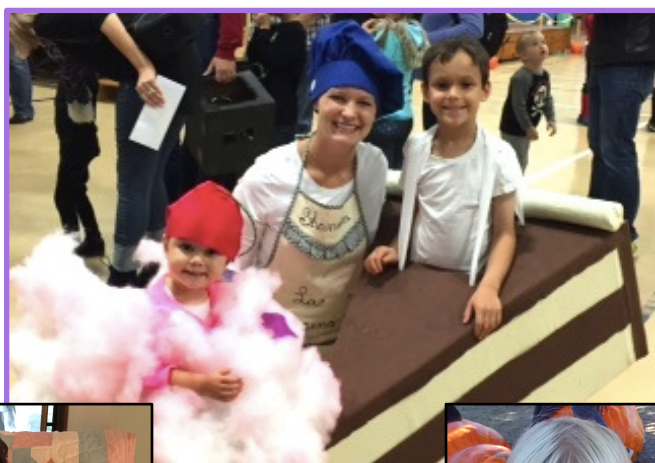


- Expert **clinical faculty** provide a broad spectrum of services, from hearing and balance, to speech and language, to learning and attention.
- They provide care in a **brand new, state-of-the-art facility**
- The clinic **integrates research and practice**. We have launched an exciting collaboration with them to provide auditory brain testing.
- The BIoTots are **improving care** – our clinical colleagues are learning from this project as much as we are. By incorporating our brain testing into their multidisciplinary approach they are providing unprecedented neurobiological assessments.

If you would like to learn more about the center, visit them online at www.communicationclinic.northwestern.edu. If you have specific questions you can also contact us at biototsresearch@gmail.com and we're happy to connect you to the best person on their team.

Halloween Raffle Winner!!

Congratulations to **Shawn** for winning this year's BIoTot Halloween Costume Raffle! We received so many wonderful pictures of BIoTots in their Halloween 2015 costumes this year. Check out Shawn with his family as tasty treats and a few other creative costumes:



Let's bake Science Cookies!

Here's a fun recipe for holiday cookies that are reminiscent of visits to our lab! Frosting, or "science paste," is used to hold toppings to the cookie (an edible version of electrodes).



Ingredients:

Cookies

1/2 c (1 stick) butter, softened
 1/2 c sugar
 1/4 c brown sugar
 1/4 c applesauce (sub 1 large egg)
 1 tsp vanilla extract
 1 3/4 cups unbleached all-purpose flour
 1/2 Tbsp cornstarch or arrowroot powder
 1 tsp baking powder
 1/2 tsp baking soda
 1/4 tsp salt
 1-2 tsp milk (for dairy-free, use non-dairy milk)

Frosting (Science Paste)

1/2 c (1 stick) butter, softened
 2 1/2 - 3 c powdered sugar
 Splash milk
 optional: 1 tsp vanilla extract or
 peppermint extract

Toppings

(Electrodes/Science buttons)

Crushed oreos
 Chocolate chips
 M&M's

Instructions:

1. Add softened butter to a large mixing bowl and cream with mixer. Add sugar, brown sugar, vanilla, and applesauce. Beat 1 min.
2. Set sifter over something that will catch fall out and add dry ingredients (flour, cornstarch, salt, baking soda and baking powder). Use a spoon to briefly stir, then sift over butter and sugar mixture.
3. Mix until incorporated. Add almond milk. Mix until soft.
4. Cover and freeze dough for 15 mins, or refrigerate for 30-45 minutes (up to overnight).
5. Preheat to 350°F and position rack in the center of oven.
6. Scoop out heaping 1 tbsps of chilled dough and roll into balls. Alternatively, roll out between two pieces of wax paper, lightly flouring the bottom layer, remove top layer, and cut out shapes. (NB: for shapes, freeze on baking sheet for 10 mins before baking)
7. Arrange cookies on baking sheet 2 inches apart. Dip a glass into cane sugar and gently smash balls into discs to bake evenly.
8. Bake on center rack for 10-12 mins for (8-10 for cutout shapes), or very slightly golden brown.
9. Remove from oven and let cool, then transfer to a cooling rack. Prepare frosting in the meantime.
10. FOR FROSTING: Wipe/rinse your mixing bowl clean and add softened butter. Beat until light and fluffy. Then add vanilla or peppermint extract (optional) and mix once more.
11. Add powdered sugar 1/2 cup at a time and continue mixing until thick and creamy. Drizzle in a little non-dairy milk to thin. You want this frosting to be pretty thick so it will hold its shape once on the cookies, so only add a little milk and add more powdered sugar if it gets too thin.
12. To add natural food coloring, finely grate a raw beet into a clean dishtowel and then squeeze it over the frosting and whisk.
13. Once cooled, frost cookies with science paste and add "buttons." Store leftovers covered at room temperature for up to a few days. Freeze for longer-term storage (up to several weeks).

Trouble shopping for your child this season? Try a book!

According to the Internet, books are great presents for children because:

1. Books are easier to wrap than footballs!
2. Books don't need batteries or assembly!
3. Books never come in the wrong color or size and never need ironing!

According to the BIoTots team, books are great presents because reading aloud to your children is one of the very best ways to help build sound-to-meaning connections. Your children hear strings of speech sounds that start to make sense as you read the text with enthusiasm, point to pictures that illustrate the content, offer clarifying comments, and ask questions.



Books expose your children to brand new vocabulary that they learn through repeated reading of favorite books. Instead of being embedded in tedious drills, the words come alive through exciting stories and fascinating non-fiction. In the same way, your children become familiar with grammar constructions by listening to books they love to hear repeated. We'd love to hear about your family's favorite books. We think it's true that a book is a gift you can open again and again and again!



To learn more about our work, visit our website:

www.brainvolts.northwestern.edu

start under "slideshows" to learn about our current projects



We want to keep in touch!

Moving? Have a new e-mail or phone number?

Update your contact information with us by
shooting an email to biototsresearch@gmail.com
or calling us at (847)-491-2457.

We're looking forward to seeing you in 2016!

