



Lori Leibold, PhD, Director, Center for Perception and Communication in Children

Table of Contents

About the CPCC (p. 2)
 Careers at BTRNH (p. 2)

Research Cores

Administrative Core (p. 3)
 Human Subjects Core (p. 3)
 Technology Core (p. 3)

Current Projects

Development of Verbal Working Memory Strategies in Young Children (p. 4)
 Development of Audiovisual Speech Enhancement in Children (p. 4)
 Differential Diagnosis of Otitis Media (p. 4)
 Introducing: Dr. Hope Sparks Lancaster (p. 5)
 External Advisory Committee (p. 5)

Alumni Notes

Walt Jesteadt, PhD (p. 6)
 Mary Pat Moeller, PhD (p. 6)

Publications

July 2019 – October 2020 (p. 7-8)

Message from our Program Director

Welcome to the Center for Perception and Communication in Children (CPCC) at the Boys Town National Research Hospital. We are a group of scientists, clinicians, engineers, and administrators committed to improving speech, language, hearing, and cognitive outcomes for children with communication disorders. Through generous funding provided by the National Institute of General Medical Sciences (P20GM109023), the CPCC provides resources that promote the success of early career faculty members and infrastructure for clinical-translational researchers at all career stages.

The past eight months have been challenging. In response to COVID-19, CPCC data collection at the hospital has been paused and faculty have transitioned to working from home. One silver lining has been the implementation of virtual and remote research projects. Members of our Technology and Human Subjects Cores have developed creative methods for recruitment and data collection, while ensuring solutions are rigorous and meet compliance requirements. We look forward to sharing these solutions with the broader scientific community in upcoming months. We see benefits beyond the pandemic, as these new tools provide the flexibility to reach further into our communities to include individuals who might not otherwise participate in on-site experiments.

Recent months have also highlighted the systematic inequalities that are still present in our communities. Consistent with the long-standing mission of Father Flanagan's Boys Town, the CPCC stands for racial equality. Using the words of Father Steven E. Boes, President and National Executive of Boys Town, "As a passionate advocate of positive social change, we firmly stand with those individuals and groups who have dedicated themselves to the cause of racial equality and justice, and strongly support their efforts to bring about lasting, significant change."

In this issue, we highlight activities of the CPCC cores and faculty. We are excited to share our progress with you, and we encourage you to reach out with inquiries. Links to our website for more information are provided throughout the newsletter.

Lori Leibold

About the CPCC

Boys Town National Research Hospital established the **Center for Perception and Communication in Children (CPCC)** in 2014 with support from a Centers of Biomedical Research Excellence (COBRE) grant from the [National Institute of General Medical Sciences](#) (NIGMS) under Award Number P20GM 109023.

The mission of the CPCC is to identify the mechanisms and factors that influence children's communication development, and auditory and visual perception. Ultimately, the goal of the CPCC is to be the national leader for research on speech, language, hearing, and cognitive development in children with communication disorders.

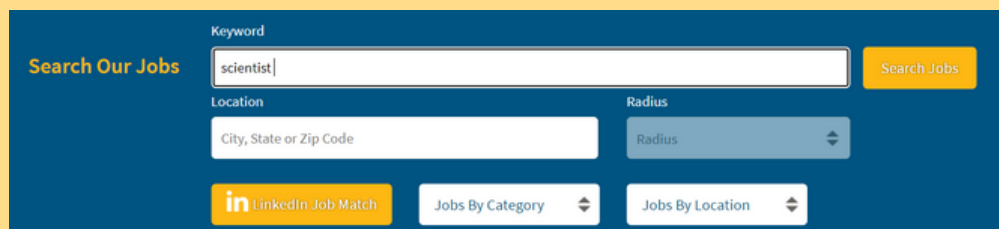


The specific aims for the CPCC are (1) to develop and support NIH-funded programs to research children's perception and communication, and (2) to strengthen the research infrastructure for junior and senior investigators. The CPCC consists of three research cores that support the achievement of these goals; these are the Administrative Core, Human Subjects Core, and Technology Core.

Click [here](#) to be directed to the CPCC homepage for more information.

Careers at BTNRH

Boys Town is currently recruiting scientists to join BTNRH and the CPCC. Click [here](#) and search keyword "**scientist**" to check out current job openings.



Research Cores

The Administrative, Human Subjects, and Technology Cores serve as the central foundation for the CPCC and provide support to individual research projects. The Cores' combined efforts facilitate the development of the CPCC, while maintaining its cohesion.

We expanded the reach of the Cores to benefit researchers outside of the CPCC, including those at other institutions. To learn more about how the Cores can support you, contact: Research-Services@boystown.org.

Click [here](#) to be redirected to the Core webpages. Recently, the Cores have adapted to support researchers' efforts to test remotely in response to challenges brought on by COVID-19.

Administrative Core

Led by Dr. Lori Leibold, the Administrative Core is responsible for establishing a framework to evaluate the center's scientific progress through a robust mentorship program for junior investigators, as well as to advance administrative processes with the goal of long-term sustainability.

The CPCC's most recent External Advisory Committee (EAC) meeting was held online May 19th & 20th due to COVID-19 restrictions. The virtual format was a success. We are grateful to our exemplary EAC members for their contributions to our program over the last seven years. Click [here](#) to learn more about EAC members.

Technology Core

Led by Dr. Daniel Rasetshwane, the Technology Core (TC) develops highly customized software for experimental design and data acquisition; provides acoustic calibration expertise and technical support for studies including EEG, EMG, and fNIRS; and provides administrative support for several software tools and platforms used by Boys Town's research staff.

The Technology Core also houses the Auditory-Visual (AV) Core Facility and the Anechoic Chamber Core Facility. Dr. Chris Stecker serves as Scientific Lead for these facilities. The AV Core Facility includes a specialized sound booth and control room for running AV and virtual reality experiments. The Anechoic Chamber Core Facility has an advanced design incorporating 19-inch tall triangular foam wedges to attenuate acoustic reverberations. Later this year, the CPCC will announce pilot grant opportunities for innovative Core Facility projects. Stay tuned for more information!

Human Subjects Core

Led by Dr. Karla McGregor, the Human Subjects Core (HSC) provides clinical measurement expertise. Recruitment of human subjects is supported by a proprietary database of > 10,000 research volunteers, a wide variety of community outreach activities and talks, and regulatory training and reports for Boys Town's 20+ labs.

The HSC also designed, built, and continues to grow its Clinical Measures Database. This database includes a broad battery of assessment data and intake information collected from over 600 research participants since the CPCC's inception.



The Anechoic Chamber Core Facility is the newest addition to our CPCC research facilities.



Current Projects



Angela AuBuchon, PhD

Development of Verbal Working Memory Strategies in Young Children

Internal Mentors: Ryan McCreery, PhD and Christopher Conway, PhD

External Mentors: Stephen Barlow, PhD (University of Nebraska at Lincoln)

Dr. Angela AuBuchon is conducting research to characterize individual differences in the rehearsal strategies used by children to overcome working-memory limitations. Working memory is the temporary storage and processing of information. Working memory contributes to performance on a wide range of academic and cognitive skills in children and adults. While it is known that young children have immature working memory, the strategies used by children to overcome limitations in working memory are not well understood. To address this important gap, Dr. AuBuchon is evaluating the influence of attentional capacity as well as differences in efficient use of processing strategies on individual differences in children's working memory.

Click [here](#) to be directed to Dr. AuBuchon's laboratory webpage for more information.



Kaylah Lalonde, PhD

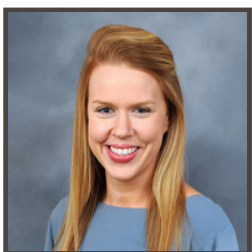
Development of Audiovisual Speech Enhancement in Children

Internal Mentor: Monita Chatterjee, PhD

External Mentor: Mitchell Sommers, PhD (Washington University)

Dr. Kaylah Lalonde is evaluating the extent to which both auditory and visual speech cues benefit children's speech processing in noise. It is well known that adults use visual speech to enhance the processing of auditory speech, a phenomenon called audiovisual (AV) speech enhancement. However, few studies have examined AV speech enhancement in children. This project includes experiments that aim to characterize age effects in the benefit of AV speech enhancement as well as examining the underlying mechanisms. Recently, Dr. Lalonde and her team expanded the scope of their research to include children with hearing loss. This work has important clinical implications, as children with hearing loss often have reduced access to auditory speech.

Click [here](#) to be directed to Dr. Lalonde's laboratory webpage for more information.



Gabrielle Merchant, PhD

Differential Diagnosis of Otitis Media

Internal Mentors: Stephen Neely, PhD

External Mentors: Emily Buss, PhD (University of North Carolina at Chapel Hill)

Dr. Gabrielle Merchant is investigating the communication outcomes of children with middle-ear infections (otitis media). While most children are diagnosed with otitis media before the age of three, the impact of otitis media on communication outcomes is variable. Dr. Merchant's project is focused on improving differential diagnoses, a critical first step towards predicting when otitis media can cause negative long-term outcomes. Dr. Merchant is evaluating wideband acoustic immittance – a noninvasive and objective measure – to differentiate between variants of otitis media in young children. Her project also investigates the relationship between these variants and the degree of conductive hearing loss.

Click [here](#) to be directed to Dr. Merchant's laboratory webpage for more information.



Introducing: Dr. Hope Sparks Lancaster



Q: Tell us a bit about your background and prior research experience?

My BA is in Psychology and my PhD is in Hearing and Speech Sciences. I started doing research during my undergraduate program, where I worked at the Learning Sciences Research Institute at the University of Illinois at Chicago. I was hooked and went on to Vanderbilt University. There I

Hope Sparks Lancaster, PhD

Development of Online Tool for Speech-Language Research

Internal Mentor: Karla McGregor, PhD

External Mentor: Sara Hart, PhD (Florida State University)

did research on language and literacy disorders. I had always been interested in the genetic component of these disorders and I managed to get a postdoctoral position at Arizona State University to learn how to incorporate genetics in my research.

While there, my postdoctoral training grant (NIH F32) was funded to study the genetics of reading disorders and I had the opportunity to work with cleft palate researchers.

Q: What motivated you to join the CPCC faculty at BTNRH?

I have always wanted a research focused position. Furthermore, collaboration and community are important to me and I wanted to work somewhere that also valued those aspects of research. When I interviewed at BTNRH, it became very clear that BTNRH supported collaboration and community.

Q: What is the focus of your COBRE project?

My COBRE project is the first piece of a larger project. There are all of these existing

genetic research cohorts, like 23&Me, that will work with researchers to collect survey or behavioral data for large scale genetic studies. But to do these studies we need online data collection tools! So, the aim of my COBRE project is to adapt existing speech, language, and reading measures into online formats that can be delivered at scale (e.g., to thousands of participants) for large genetic studies on speech, language, and reading. We will be testing the tool and validating that it is sensitive to atypical speech, language, and reading performance.

Dr. Hope Sparks Lancaster joined the CPCC in August of this year.

External Advisory Committee

The External Advisory Committee (EAC) reviews and provides feedback on individual projects and overall program developments to ensure scientific rigor. The EAC consists of five members, all of whom have extensive experience as grant reviewers and mentors.

Lisa Bedore, PhD, Chair and Professor, Department of Communication Sciences and Disorders, Temple University

Lisa Goffman, PhD, Professor, Nelle C. Johnston Chair in Communication Disorders in Children, School of Behavioral and Brain Sciences, University of Texas at Dallas

Kevin Munhall, PhD, Professor, Department of Psychology, Queen's University (Ontario, Canada)

Andrew Oxenham, PhD, Professor, Department of Otolaryngology, Head and Neck Surgery, University of Minnesota

Robert Shannon, PhD, Chair of EAC, Emeritus Professor of Research in Otolaryngology, Biomedical Engineering, and Neuroscience, University of Southern California

Click [here](#) to be directed to the EAC webpage for more information.



Alumni Notes



Walt Jesteadt, PhD

Founding Program Director

Walt retired in 2017 and now splits his time between Omaha and North Dakota, where he spends his time remodeling a 100-year old cottage and walking on the beach of Lake Sakakawea. Walt was the founding Program Director of the CPCC and continued in that role until 2017. He remains active in retirement, serving the CPCC as the Chair of the Administrative Advisory Committee. Last year he published an outstanding article that describes how BTNRH became a leading center for hearing research. You can read his work [here](#).



Mary Pat Moeller, PhD

Founding Human Subjects Core Director

Mary Pat retired from BTNRH in 2018, relocating to Charlotte, North Carolina where she enjoys spending time with her husband, children, and grandchildren. She continues to be involved in competitive swimming and has also taken up stand-up paddle boarding. Mary Pat was the founding Director of the Human Subjects Core, providing an outstanding foundation for the next generation of scientists at BTNRH. She continues to serve BTNRH in a consulting role. Her main current focus is leading the effort to revise an International Consensus Statement on Family Centered Early Intervention for Children who are Deaf or Hard of Hearing (originally published in 2013). She also continues to collaborate on manuscripts related to the [Outcomes of School Age Children who are Hard of Hearing](#) project (OSACHH).



The following publications received support from our COBRE grant (Award Number P20GM 109023)..

- Al-Salim S, Moeller MP, McGregor KK, [Performance of Children With Hearing Loss on an Audiovisual Version of a Nonword Repetition Task](#). *Lang Speech Hear Serv Sch*. 2020 Jan 8;51(1):42-54. doi: 10.1044/2019_LSHSS-OCHL-19-0016. Epub 2020 Jan 8. PubMed PMID: 31913807; PubMed Central PMCID: PMC7251587.
- Aloi J, Blair KS, Meffert H, White SF, Hwang S, Tyler PM, Crum KI, Thornton LC, Mobley A, Killanin AD, Filbey FM, Pope K, Blair RJ. [Alcohol Use Disorder and Cannabis Use Disorder Symptomatology in Adolescents Is Associated With Dysfunction in Neural Processing of Future Events](#). *Addict Biol*. 2020 Mar 5;:e12885. doi: 10.1111/adb.12885. [Epub ahead of print] PubMed PMID: 32135572.
- Aloi J, Blair KS, Crum KI, Bashford-Largo J, Zhang R, Lukoff J, Carollo E, White SF, Hwang S, Filbey FM, Dobbertin M, Blair RJ. [Alcohol Use Disorder, but Not Cannabis Use Disorder, Symptomatology in Adolescents Is Associated With Reduced Differential Responsiveness to Reward Versus Punishment Feedback During Instrumental Learning](#). *Biol Psychiatry Cogn Neurosci Neuroimaging*. 2020 Jun;5(6):610-618. doi: 10.1016/j.bpsc.2020.02.003. Epub 2020 Feb 19. PubMed PMID: 32299790; PubMed Central PMCID: PMC7286796.
- Ambrose SE, Appenzeller M, Al-Salim S, Kaiser AP. [Effects of an Intervention Designed to Increase Toddlers' Hearing Aid Use](#). *J Deaf Stud Deaf Educ*. 2020 Jan 3;25(1):55-67. doi: 10.1093/deafed/enz032. PubMed PMID: 31711178; PubMed Central PMCID: PMC7275820.
- Ambrose SE, Appenzeller M, Mai A, Desjardin JL. [Beliefs and Self-Efficacy of Parents of Young Children With Hearing Loss](#). *J Early Hear Detect Interv*. 2020 May;5(1):73-85. PMID: 32999939; PMCID: PMC7523736.
- Appenzeller MC, Ambrose SE. [Using Technology to Monitor Hearing Device Use and Linguistic Environments: Early Intervention Providers' Perspectives](#). *J Early Hear Detect Interv*. 2020;5(1):62-72. PMID: 32968696; PMCID: PMC7507746.
- AuBuchon, A. M., Kronenberger, W. G., Stone, L., & Pisoni, D. B. (2020). [Strategy Use on Clinical Administrations of Short-Term and Working Memory Tasks](#). *Journal of Psychoeducational Assessment*. <https://doi.org/10.1177/0734282920930924>
- Bosen AK, Barry MF. [Serial Recall Predicts Vocoded Sentence Recognition Across Spectral Resolutions](#). *J Speech Lang Hear Res*. 2020 Apr 27;63(4):1282-1298. doi: 10.1044/2020_JSLHR-19-00319. Epub 2020 Mar 26. PubMed PMID: 32213149; PubMed Central PMCID: PMC7242981.
- Bosen AK, Luckasen MC. [Interactions Between Item Set and Vocoding in Serial Recall](#). *Ear Hear*. 2019 Nov/Dec;40(6):1404-1417. doi: 10.1097/AUD.0000000000000718. PubMed PMID: 31033634; PubMed Central PMCID: PMC6776730.
- Chatterjee M, Kulkarni AM, Siddiqui RM, Christensen JA, Hozan M, Sis JL, Damm SA. [Acoustics of Emotional Prosody Produced by Prelingually Deaf Children With Cochlear Implants](#). *Front Psychol*. 2019 Sep 30;10:2190. doi: 10.3389/fpsyg.2019.02190. eCollection 2019. PubMed PMID: 31632320; PubMed Central PMCID: PMC6779094.
- Christensen JA, Sis J, Kulkarni AM, Chatterjee M. [Effects of Age and Hearing Loss on the Recognition of Emotions in Speech](#). *Ear Hear*. 2019 Sep/Oct;40(5):1069-1083. doi: 10.1097/AUD.0000000000000694. PubMed PMID: 30614835; PubMed Central PMCID: PMC6606405.
- Damm SA, Sis JL, Kulkarni AM, Chatterjee M. [How Vocal Emotions Produced by Children With Cochlear Implants Are Perceived by Their Hearing Peers](#). *J Speech Lang Hear Res*. 2019 Oct 25;62(10):3728-3740. doi: 10.1044/2019_JSLHR-S-18-0497. Epub 2019 Oct 7. PubMed PMID: 31589545; PubMed Central PMCID: PMC7201339.
- Flaherty MM, Buss E, Leibold LJ. [Developmental Effects in Children's Ability to Benefit from F0 Differences Between Target and Masker Speech](#). *Ear Hear*. 2019 Jul/Aug;40(4):927-937. doi: 10.1097/AUD.0000000000000673. PubMed PMID: 30334835; PubMed Central PMCID: PMC6467703.
- Helfer KS, Poissant SF, Merchant GR. [Word Identification With Temporally Interleaved Competing Sounds by Younger and Older Adult Listeners](#). *Ear Hear*. 2020 May/Jun;41(3):603-614. doi: 10.1097/AUD.0000000000000786. PubMed PMID: 31567564; PubMed Central PMCID: PMC7080604.
- Holt RF, Beer J, Kronenberger WG, Pisoni DB, Lalonde K, Mulinaro L. [Family Environment in Children With Hearing Aids and Cochlear Implants: Associations With Spoken Language, Psychosocial Functioning, and Cognitive Development](#). *Ear Hear*. 2020 Jul/Aug;41(4):762-774. doi: 10.1097/AUD.0000000000000811. PubMed PMID: 31688320; PubMed Central PMCID: PMC7190421.
- Jorgensen EJ, McCreery RW, Kirby BJ, Brennan M. [Effect of Level on Spectral-Ripple Detection Threshold for Listeners With Normal Hearing and Hearing Loss](#). *J Acoust Soc Am*. 2020 Aug;148(2):908. doi: 10.1121/10.0001706. PMID: 32873021; PMCID: PMC7443170.
- Kamerer AM, Kopun JG, Fultz SE, Allen C, Neely ST, Rasetschwane DM. [Examining Physiological and Perceptual Consequences of Noise Exposure](#). *J Acoust Soc Am*. 2019 Nov;146(5):3947. doi: 10.1121/1.5132291. PubMed PMID: 31795718; PubMed Central PMCID: PMC6881192.



- Kamerer AM, Kopun JG, Fultz SE, Neely ST, Rasetshwane DM. [Reliability of Measures Intended to Assess Threshold-Independent Hearing Disorders](#). Ear Hear. 2019 Nov/Dec;40(6):1267-1279. doi: 10.1097/AUD.0000000000000711. PubMed PMID: 30882533; PubMed Central PMCID: PMC6745005.
- Kamerer AM, AuBuchon A, Fultz SE, Kopun JG, Neely ST, Rasetshwane DM. [The Role of Cognition in Common Measures of Peripheral Synaptopathy and Hidden Hearing Loss](#). Am J Audiol. 2019 Dec 16;28(4):843-856. doi: 10.1044/2019_AJA-19-0063. Epub 2019 Oct 24. PubMed PMID: 31647880; PubMed Central PMCID: PMC7210438.
- Lalonde K. [Effects of Natural Variability in Cross-Modal Temporal Correlations on Audiovisual Speech Recognition Benefit](#). Proc. Interspeech 2019, 2260-2264, DOI: 10.21437/Interspeech.2019-2931.
- Lalonde K, Werner LA. [Infants and Adults Use Visual Cues to Improve Detection and Discrimination of Speech in Noise](#). J Speech Lang Hear Res. 2019 Oct 25;62(10):3860-3875. doi: 10.1044/2019_JSLHR-H-19-0106. Epub 2019 Oct 16. PubMed PMID: 31618097; PubMed Central PMCID: PMC7201336.
- Lalonde K, McCreery RW. [Audiovisual Enhancement of Speech Perception in Noise by School-Age Children Who Are Hard of Hearing](#). Ear Hear. 2020 Jul/Aug;41(4):705-719. doi: 10.1097/AUD.0000000000000830. PubMed PMID: 32032226.
- Leibold LJ, Browning JM, Buss E. [Masking Release for Speech-in-Speech Recognition Due to a Target/Masker Sex Mismatch in Children With Hearing Loss](#). Ear Hear. 2020 Mar/Apr;41(2):259-267. doi: 10.1097/AUD.0000000000000752. PubMed PMID: 31365355; PubMed Central PMCID: PMC7310385.
- Merchant GR, Siegel JH, Neely ST, Rosowski JJ, Nakajima HH. [Effect of Middle-Ear Pathology on High-Frequency Ear Canal Reflectance Measurements in the Frequency and Time Domains](#). J Assoc Res Otolaryngol. 2019 Dec;20(6):529-552. doi: 10.1007/s10162-019-00735-1. Epub 2019 Oct 31. PubMed PMID: 31673928; PubMed Central PMCID: PMC6889121.
- Merchant GR, Schulz KM, Patterson JN, Fitzpatrick D, Janky KL. [Effect of Cochlear Implantation on Vestibular Evoked Myogenic Potentials and Wideband Acoustic Immittance](#). Ear Hear. 2020 Sep/Oct;41(5):1111-1124. doi: 10.1097/AUD.0000000000000831. PMID: 32032225; PMCID: PMC7392788.
- Moeller MP, Thomas AE, Oleson J, Ambrose SE. [Validation of a Parent Report Tool for Monitoring Early Vocal Stages in Infants](#). J Speech Lang Hear Res. 2019 Jul 15;62(7):2245-2257. doi: 10.1044/2019_JSLHR-S-18-0485. Epub 2019 Jul 2. PubMed PMID: 31265353; PubMed Central PMCID: PMC6808354.
- Patterson J, Rodriguez A, Barin K, Janky KL. [Effect of Gaze Angle During the Vertical Video Head Impulse Test Across Two Devices in Healthy Adults and Subjects With Vestibular Loss](#). Otol Neurotol. 2020 Jul;41(6):e751-e758. doi: 10.1097/MAO.0000000000002652. PubMed PMID: 32343516; PubMed Central PMCID: PMC7311278.
- Picou EM, Lewis D, Angleley G, Tharpe AM. [Rerouting Hearing Aid Systems for Overcoming Simulated Unilateral Hearing in Dynamic Listening Situations](#). Ear Hear. 2020 Jul/Aug;41(4):790-803. doi: 10.1097/AUD.0000000000000800. PubMed PMID: 31584502; PubMed Central PMCID: PMC7117994.
- Porter HL, Leibold LJ, Buss E. [Effects of Self-Generated Noise on Quiet Threshold by Transducer Type in School-Age Children and Adults](#). J Speech Lang Hear Res. 2020 Jun 22;63(6):2027-2033. doi: 10.1044/2020_JSLHR-19-00302. Epub 2020 May 27. PMID: 32459139.
- Salanger M, Lewis D, Vallier T, McDermott T, Dergan A. [Applying Virtual Reality to Audiovisual Speech Perception Tasks in Children](#). Am J Audiol. 2020 Jun 8;29(2):244-258. doi: 10.1044/2020_AJA-19-00004. Epub 2020 Apr 6. PubMed PMID: 3225064

