

USU Team to Build an AI-Based App Supporting Parents of Children Who Use Hearing Aids

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The app will provide proven strategies to support behavior change in parents.

Karen Muñoz, professor and head of the Department of Communicative Disorders and Deaf Education in the Emma Eccles Jones College of Education and Human Services, has received a grant from the Research and Development group of Sonova, a Switzerland-based hearing device company that specializes in hearing care ranging from seniors to pediatrics. The funding will be used to develop an app for exploration purposes that leverages artificial intelligence to support the parents of children who use hearing aids, with additional funding to be awarded in upcoming phases of the project.

Approximately 99 percent of children born in the United States receive a hearing screening within days of birth and most children diagnosed with hearing loss are fitted with hearing aids within the first months of life. For spoken language development, children need to wear their hearing aids whenever they are awake. The amount of time the child wears hearing aids is critical to their neurological development; however, many children only wear them a few hours a day. Unfortunately, this isn't enough to avoid developmental delays early in their life, which directly impacts children's ability to talk, their education prospects, and their life's trajectory.

"You've got to get sound to the brain," says Muñoz. "Research shows that children who wear hearing aids ten hours or more per day have better language outcomes than children who wear them for less time. They won't have the development they could otherwise."



Karen Muñoz, professor and head of the Department of Communicative Disorders and Deaf Education at USU

Leaving a 20-year career in clinical audiology for academia in 2007, Muñoz has spent the past 17 years at USU researching issues related to pediatric audiology and the last 11 years applying her expertise to researching and remedying the problem with hearing aid use for young children. Through other research projects, she has closely examined what parents are experiencing emotionally and socially and has conducted several interventional studies to learn the best ways to help parents get the support they need.

Muñoz explains the problem, according to her research findings. "We can identify hearing loss early and provide well-programmed hearing aids so children have access to sound, but we send the parents home to handle daily management tasks with minimal support for the challenges they experience. Basically, they need to fend for themselves," she says. "They get varying amounts of support, but not enough to change their behaviors on a day-to-day basis." Most parents are unfamiliar with hearing loss and hearing aids, so it makes sense that they need help. Additionally, it can take time for parents to gain confidence in managing their child's hearing aid use.

For instance, it's common for toddlers to repeatedly take out their hearing aids during this developmental period. "It drives parents crazy. They feel like they're putting them back on all day, and that can get frustrating, so getting them back on ears may or may not happen."

This is where the app comes in. Its aim is to provide parents with evidence-based information to help them

learn new skills. The app will provide proven strategies to support behavior change as parents incorporate the hearing aids into their daily lives. The app will also provide guidance for behavior management techniques, so they have regular support in managing their child's hearing aid use amid often unpredictable family life.

"Parents don't need guilt," Muñoz says. "They know how important hearing aids are. They need support. We're trying to find a scalable way to give parents access to that support. We are hopeful this app will give them confidence and help them deal with their thoughts and emotions so they can handle the day-to-day stuff effectively. We want to help them be comfortable with the routine—putting the hearing aids on, making sure they work every day, and handling different environments that can be more challenging."

To develop the app, Muñoz is working with an interdisciplinary team at USU who are bringing their unique skillsets to the project. Michael Twohig, professor in the Department of Psychology and world leader in Acceptance and Commitment Therapy (ACT), is incorporating acceptance, mindfulness, and values-based strategies (basic principles of ACT) into the app's content. Casey Clay, assistant professor in Special Education and Rehabilitation Counseling (SPERC) with an emphasis in behavior analysis, is creating and testing short video segments that will incorporate behavior management skills. Sharad Jones, a data analyst in the Analytics Solutions Center in the Huntsman School of Business, is using his team of developers to build the app. Muñoz and colleague Danielle Glista at Western University in Ontario, Canada, are the audiologists on the team.

"I have been working with Karen Muñoz for more than 10 years, and in that time she has transformed the way we think about person-centered care in audiology," says Twohig. "Her work has found that, in order to get the greatest adherence to audiological care, we need to address all issues that affect the client. This includes many variables that have historically not been addressed such as emotional and psychological issues. I have loved working with her on ways to address the psychosocial issues that clients may face."

The app will enable parents to set goals and track the hours their child is wearing his or her hearing aids. It will also feature AI assistance that will enable parents to search relevant online content for answers to questions they may have. In addition to the AI component, videos will educate parents who can then share them with other caregivers, such as grandparents and babysitters, so their support can be expanded to a larger sphere of people in the child's lives.

Sonova, the largest supplier of hearing aids in the world and one of the only companies focused on pediatric audiology, joined forces with Muñoz and her team in late Fall of 2024, a year after the researchers began working together on the app and before receiving funding. Muñoz had approached Sonova to discuss ideas around how an app could help parents with the daily management of hearing aids. Subsequent discussions led the researchers to the R&D group at Sonova, who expressed an interest in funding the project.

If the project is successful and the results are impacting parent behavior in ways the team anticipates, Muñoz and her colleagues are hopeful the app will be available to parents of children around the world. "This is still a research project, and we will publish papers, but in the end we will also have a resource for parents," she says. "My goal is for families with kids with hearing loss, regardless of where they live, to have the support and help they need. I'm hoping parents can move forward with confidence and their children can have access to sound so their development will be optimized."