

Professor Awarded \$2.6M NIH Grant for Research on Listener Training to Support Communication for People with Parkinson's Disease

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Stephanie Borrie

Communication is integral to our daily lives. It serves as the foundation for building and maintaining relationships, conducting work, raising children, accessing services, engaging in our communities, and much more. Stephanie Borrie, associate professor in the Department of Communicative Disorders and Deaf Education, was recently awarded a second multimillion dollar grant from the National Institutes of Health to improve communication in people with Parkinson's disease. This most recent grant, a \$2.6M grant, is a five-year clinical trial that seeks to provide the necessary efficacy data for a new approach to treat the speech intelligibility challenges that frequently accompany Parkinson's disease.

"Traditional speech treatments for people with Parkinson's disease focus on the person with Parkinson's disease," says Borrie. "But these speaker training treatments (e.g., strategies like talking louder and speaking more clearly) require substantial cognitive and physical effort on the part of the speaker to achieve and maintain gains. Therefore, patients with intelligibility deficits who cannot behaviorally modify their speech are not viable candidates for current speech interventions. This constitutes a significant health disparity, and one that disproportionately affects people with a progressive neurological disease."

Borrie proposes a novel way of thinking about this issue of speech intelligibility by focusing on the listener instead of the person who is speaking. The definition of speech intelligibility is the accuracy with which a message is conveyed by a speaker and received by a listener. "So, what if we didn't try and make the person with dysarthria (a motor-based impairment that makes speech difficult to understand) speak better, but instead we make their communication partner understand better?"



Study participants will listen to speech samples to train them to better understand the spoken words of people with Parkinson's Disease.

This question has driven a large part of Borrie's research over the last decade as she has sought to understand how listeners can learn to better understand the speech of people with speech disorders (listener training). "You've probably all experienced or observed this naturally in your own lives," says Borrie. "You're chatting to a parent and their kid comes up and says something completely unintelligible, and you think, what was that? And the parent says, 'oh, he wants an ice cream'. The parent has adapted their representation of language to account for the ambiguous speech sounds. Our research has shown that we can use these adaptation mechanisms to help communication partners better understand someone with a neurological speech disorder."

In this grant, Borrie and her collaborator, Associate Professor Kaitlin Lansford from Florida State University, will move their research program from bench to bedside by taking what they have learned over the last 10 years about the science of listener training in the lab and implementing it into a structured training program. They will conduct a large randomized controlled clinical trial to establish the efficacy of using this training program with people with Parkinson's disease and their primary communication partners (e.g., spouse, family, friends).

In brief, the listener training involves recording speech from people with Parkinson's disease and then using these speech samples in a training program that is provided to their communication partners. Training sessions are completed in front of computer with headphones

and an evidence-based communication skills software program designed using the data in both Borrie and Lansford's research labs. In previous studies, Borrie and Lansford have documented up to 20% intelligibility improvement following listener training. This exceeds the 5-12% benchmark that is considered clinically significant improvement for treatment in neurological speech disorders.

In addition to shifting the burden of treatment from the person with the speech disorder onto their communication partners, this training can be done both in the clinic or at home. In this way, many more participants can participate in the study. "Health disparities are a huge issue for many families who live in rural communities and seek healthcare treatment options. When treatment can be delivered remotely, it can mitigate some of these disparities," explains Borrie.

"The hope is that this grant will also expand clinical outcome measures. Across a number of studies, we have demonstrated improvements to intelligibility following listener training. We anticipate finding similar results in this critical clinical trial. But we do not yet know how listener training will impact measures such as listening effort, comprehension, and participation in communicative interactions. We are excited to learn more about the broader communication impacts of listener-based training in this funded project," Lansford said.

"The goal is to help people with speech disorders experience more successful communication so that they can fully participate in all aspects of their lives," concludes Borrie. "Working with individuals with neurological disorders is very rewarding, but the treatment options have been limited until now. We have been working on understanding how to change this in the lab for years, and it's finally reached the point of taking this science to the real world and establishing new evidenced-based treatment tools for clinical use. It's really exciting to be at this point."

Currently, Borrie mentors 11 student researchers in her lab, who range from undergraduates to postdocs. This research keeps Borrie busy, but she is passionate about helping people with speech disorders and their communities to communicate more successfully with one another.