Transgender and gender diverse people may benefit from a proper voice training app

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Transgender and gender diverse people want the same thing most people take for granted when visiting a store, restaurant or movie: to be respected, feel safe in their surroundings and to be properly

acknowledged when addressed.

But that doesn't happen for many who report negative encounters that can lead to harassment or in worst cases violence.

Often the cue for this bad behavior is a voice-gender incongruence—or a mismatch between the person's gender and the way their voice is perceived by themselves and others. An example is a trans woman being referred to as "sir" because she has a deep voice.

A study co-authored by University of Cincinnati researcher Vesna Dominika Novak suggests that transgender and gender diverse people may benefit from better-designed smartphone apps that offer voice and communication training software that help lessen voice-gender incongruence for transgender individuals. The study is available in the *Journal of Voice* and includes the results of a 57-question survey and interviews of 21 transgender and gender diverse individuals focusing on voice, technology app usage, surgery, voice training and gender expression and identity.

Four app features were identified as most critical: feedback, which could be real-time or terminal; accountability, which could be enhanced by long-term performance monitoring and reminders; automated goal setting and training voice characteristics other than pitch. Participants also saw a need for non-interactive elements such as videos to provide fundamental knowledge. The end goal is allowing the individual's voice to be perceived as more feminine or masculine.

"For some people the need for voice training is an internal motivation, they don't like the way they sound," says Novak, Ph.D., associate professor in UC's College of Engineering and Applied Science, and the study's corresponding author. "For others it's just, 'I just don't want to get beat up when I go somewhere.' People talk in a different way to fit in

so they are not noticed. Some people stress out when they hear themselves and others don't care how they sound."

"There are some voice training apps available, but they have been criticized by users, and some are for profit," says Novak. "We wanted to make a better one, but we felt that we should first find out what people actually want to see in an app. And that worked out with this study, so we pulled a lot of design idea where people say, 'I want that; I want it done this way.'"

"Voice training is training fundamentally," says Novak. "A lot of people will do it for two hours and give up. It is like weight loss for two hours. You don't get anything from that. But if you do this long term you will see results. It works if you do it well enough and long enough. Most people can't figure out how to do it well."

Novak, who is transfeminine, says her study began while she was a faculty member at the University of Wyoming in Laramie, Wyoming. Other co-authors who are also associated with the University of Wyoming include: Erin Jill Bush, Ph.D., Breanna Irene Krueger, Ph.D., and Joshua Dean Clapp, Ph.D. Mel Cody, a community member and lead organizer of the 2021 Laramie Pridefest, was also an author of the study.

Novak says a properly designed app could be more accessible and offer cheaper alternatives to professional voice training or surgical procedures. Surgery can improve voice pitch and perceived femininity or masculinity in trans women and men, but has negative effects like reduced pitch range, phonation time and loudness.

"Trans people want to have apps or software because they can't afford to pay for professional help," says Novak. "It is so overwhelming to try to do voice training by yourself and many individuals will give up if they

have no support. They want to feel included and respected and not just talked at when using an app. They want interactive elements that don't stress them out. They want feedback on how to do it but they don't want to feel judged or stressed out."

Novak says making sure an app provides feedback was a valuable suggestion made during the survey.

"It's like doing yoga," says Novak. "You can watch a video on how to do a pose and you can do it, but if someone doesn't tell you if you are doing it right, you won't get better. With this app people want to hear, 'This is what you are good at' and 'this is where you need to improve.' There are apps out now that offer suggestions on what to do but you have no idea if it has been done right."

Novak says survey participants also asked for accountability with an app. "They want reminders on when to do it and they want to see improvement," she notes. "The app can say you are 5% better today, offering positive reinforcement to keep users on track."

So what's the next step for Novak and the team of researchers? "I know for a fact there is a team at Cornell University working on an app," says Novak. "There is a good chance we are going to start working on our own app or maybe a set of exercises, maybe not a full stand alone product. But we need those interactive exercises with good feedback and accountability measures."