

NARRATOR: When a person's senses begin to fade, they often feel disconnected from friends, family, and community. Now there is new hope for people with sensory deficits. The University of Minnesota has launched the Center for Applied and Translational Sensory Science, known as CATSS.

CATSS is an innovative interdisciplinary research collaborative based on the premise that people have multiple senses that work together in complicated ways. Peggy Nelson is the director of CATSS:

DR. PEGGY NELSON: *So the world is going on around us and we have multiple sensory ways to get information, and our senses work together in complicated ways. So vision and hearing work together when we're in a conversation. Everybody is multi-sensory.*

It is not just a specialized group who is in need multi-sensory research. We're all multi-sensory. Depending on the room, or the situation, our age or our health, we might be relying more on one sense than the other, but we want to be able to switch and balance those. So we think we're into some new territory here that we hope will lead to some new solutions.

NARRATOR: The CATSS Center and its Multi-Sensory Perception Lab is doing groundbreaking work to tackle the problems faced by people with sensory deficits.

DR. NELSON: *It is leading edge stuff. There have been individuals and small groups who have worked on multi-sensory projects for decades and we are relying on their foundational work.*

NARRATOR: Before Dr. Nelson became the director of CATSS, she was Chair of the Department of Speech-Language-Hearing Sciences, one of the formative branches of multi-sensory research. One of her own research interests is in the area of sensory aids for hearing loss.

DR. NELSON: *Well, the common ground is the brain. I am an audiologist and sometimes we audiologists are accused of thinking about the ear more than we think about the brain. Clearly, hearing is a source of input to the brain. So is vision. So we know that they come together at the point in the brain where we are trying to make sense of our environment.*

There are differences. So, vision science has progressed in a way that has discovered some things that have been faster than the auditory science has been. On the other hand, in hearing science we have the one successful implant - a cochlear implant - which hasn't been successful in the visual realm. So we very much hope that one can inform the other.

NARRATOR: Dr. Gordon Legge is a science co-director at CATSS. He is a Distinguished McKnight University Professor and former Chair of the University of Minnesota's Department of Psychology. Dr. Legge, who himself has low vision, is also the founder of the Minnesota Lab for Low Vision Research. He is internationally recognized for his work with visual perception, cognition and reading. He feels unique circumstances at the University of Minnesota created fertile ground for CATSS and the Multi-Sensory Perception Lab:

DR. GORDON LEGGE: *We have, really, maybe unique but certainly unusual strength in both vision science and auditory science. If you look across universities in the US or across the world you'll find places that have excellence in one or the other, but very few that have excellence in both. I think we are blessed here by having clusters of researchers. And I think we are very lucky to have Peggy come in as our first director.*

NARRATOR: Dr. Legge said CATSS is collaborating and building alliances with other key departments at the university:

DR. LEGGE: *There is support or interest from the medical school and, of course, the College of Liberal Arts, which includes Psychology. We also have the College of Science and Engineering, people with engineering and computer science expertise to help with development of technology. And there's also a group in Kinesiology - so, there in Kinesiology, they're interested in motor control, balance, posture, and vision, for example.*

NARRATOR: Dr. Nelson emphasizes the importance of interdisciplinary research for the study of balance:

DR. NELSON: *Balance is kind of a perfect multi-sensory system. We rely on what we can see; we rely on our ears - our vestibular system and our ears - and we rely on proprioception, how we stand. Balance is kind of a three-sensory system naturally.*

So we have the balance laboratory, that's out behind us right now, and what we're looking at, along with people from the medical school, from the Otolaryngology Department, is how certain environmental conditions might affect our balance system.

NARRATOR: The CATSS Center focuses on the real-world problems of people with sensory limitations such as hearing and vision loss. The goal is informing the development of devices and technologies to help solve those problems. An important goal for CATSS is partnering with industry for new product development. Dr. Nelson says the university is embracing these types of collaborations:

DR. NELSON: *Around ten years ago, the University of Minnesota really changed its approach to working with industry and made it a much more transparent and desirable environment for companies to come to the University of Minnesota, for the companies to say "We already have a fledgling idea, we can use some help on this. How could we negotiate ownership of that idea - that intellectual property - so that once the solution is done, each side of the partnership gets what's due to them?"*

NARRATOR: Dr. Legge says the translational aspect of CATSS signals the goal of creating ideas that will work in the real world:

DR. LEGGE: *Translational is kind of a buzzword that's come up in biomedical research. Sometimes people use the little cliché "bench to bedside." That kind of means "from the laboratory to the clinic" - and that's kind of the translational piece, moving from basic laboratory science to its applications in a clinical context. So, maybe, the development of iPhone apps for spatial information to people who are visually impaired.*

NARRATOR: Dr. Nelson emphasizes CATSS' goal is doing work that people will actually use.

DR. NELSON: *We very consciously don't want to be doing this research "in a bubble." We want to be listening, attending to what people who are living with sensory deficits say that they live through, what their limitations are, what the needs are. We want this to be something that would be actually of use to people. The key to helping someone reach their full potential is communication and connection with their environment.*

NARRATOR: For more information, go to CATSS online; C-A-T-S-S dot UMN dot EDU.

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Produced: February 2, 2017