



PODCAST #2: DR. GORDON LEGGE & MN READ (TRANSCRIPT)

NARRATOR: Welcome to a CATSS profile. We are featuring Dr. Gordon Legge, scientific co-director of CATSS - the Center for Applied and Translational Sensory Science - at the University of Minnesota. Dr. Legge is the former Chair of the U of M Department of Psychology and one of the founders of CATSS.

One of Dr. Legge's specialties is helping people with low vision increase their ability to read and comprehend printed words. His work led to the creation of MN Read. The name "MN Read" stands for "Minnesota Eye Chart for Measuring Reading Vision."

For Dr. Legge, his work with reading and low vision started early in life. This is Gordon Legge in his own words:

DR. GORDON LEGGE: I did have a life threatening disorder called Stevens-Johnson Syndrome. Of course I recovered from it, but my vision, my eyes, were permanently damaged, so I had very low visual acuity.

So, I started off learning print; my parents and actually a home teacher for the first year drew big black letters on cardboard for me to learn print. But then I went to a school for the blind.

At that time, they discouraged visual reading, so I learned Braille, but I continued to know how to read visually. And then when I got into high school and university, I got access to video magnifiers, so-called TV magnifiers, so I could read highly enlarged print on the video screen. Then, years later we got to computers, where screen magnification software enabled me to magnify print to very large size on the computer screen. So, that became very valuable to me.

And then, over the years, probably my vision -- I've always had very low acuity since age six, but it's probably deteriorated very slowly -- so I became more reliant on the use of audio screen-reading software and computer audio books and so on. So now, I still use vision to read difficult material, like math equations or graphs, but I rely pretty heavily myself on audio, computer speech, audio books and the like for reading long passages of narrative text.

NARRATOR: Dr. Legge talks about how he began to make reading and low vision his life's work.

DR. LEGGE: As a student in college I was a physics major and I actually started off in graduate school in astronomy. I was very interested in physics, astrophysics, but at some point I decided that I wanted to work on a topic that was more related to the human condition, if you want to put it that way.

So I switched into psychology, I ended up doing my PHD in psychology. But one of the specialty areas of psychology is how the visual system works, visual perception. My PhD thesis was based on sort of basic properties of human visual perception, normal vision now, not low vision.

After I finished my PHD I did a post-doctoral year at Cambridge University, and my mentor there was Fergus Campbell, who was a famous scientist. His background had been in Ophthalmology, and he sort of opened the window to me on applications of basic visual science to clinical areas of vision and low vision in particular.

So when I came to the University of Minnesota as a young professor, I started thinking about, okay, how can this basic research on vision science be applied to understanding issues facing people with low vision, particularly reading, which everybody recognized even in those days many years ago, reading was a big problem for low vision.

And I start hunting around in the literature and I discovered there had been very little research done on reading and low vision. There was some clinical advice because the clinicians knew about these problems but very little laboratory research, very little application of vision science to low vision.

So, thus began my foray into low vision research. I wrote a small grant to NIH to study some aspects of low vision reading and, here is an interesting thing that happened: NIH received this grant; they'd been looking for researchers to do some work on low vision, hadn't had any applications, so they said here's a young guy, seems to have some reasonable ideas... why don't we encourage him, why don't we give him extra money on his grant so he can actually do more than he's proposing to do here.

So this is pretty unheard of to actually ask for a grant and have them come back saying we'd like to double it. So, I was able to hire a colleague who came in as a post-doctoral researcher, Dennis Pelley, who's now a famous researcher at New York University, and he and I got this program of low vision research off the ground and we've been working hard on it ever since, and I think we've played a major role in opening up the whole field of vision science to studies of low vision.

NARRATOR: That research led to the development of MN Read eye test technology. Dr. Legge describes the differences between traditional letter charts and MN Read chart:

DR. LEGGE: The test is kind of like a standard letter chart, except instead of using isolated letters, it uses passages or single sentences that have been carefully calibrated both in terms of their visual characteristics, size, length, and so on and also in terms of their linguistic properties.

When the test is done, the examiner asks the subject or the patient to read aloud the sentences, they decrease in size just as the lines on the typical eye chart decrease. The examiner will time how long it takes the person to read each sentence and then that can be converted into a reading speed.

NARRATOR: Dr. Legge talks about the development of MN Read:

DR. LEGGE: Well, it's kind of an interesting history... it goes back into some early research in my lab in the 1980's when we were first trying to uncover a better understanding of the limitations or challenges for low vision reading. So, we had developed some computerized tests of reading speed, how it's affected by print size, contrast, color of the text and so on. And then at some point it was suggested that maybe this technology would be useful for clinical applications or research applications.

We first developed a set of reading cards, printed cards with very large print, sentences, similar to the current MN Read sentences. So, colleagues suggested, well, why don't you make a chart, kind of like an eye chart, but make it built out of sentences. So that's exactly what we did.

All of the MN Read sentences have exactly 60 characters. These sentences also have to format into a box of a given shape and size, three lines, approximately 20 characters per line.

NARRATOR: A purpose of MN Read is to simulate a person's reading environment to provide real-world assessments:

DR. LEGGE: We want it to be a good surrogate for everyday reading. The whole goal of this test is to provide information that is transferable or is relevant to everyday reading. Just to give one example of that, this test, the MN Read test, is printed using the Times Roman font. The reason we selected that font is it's a very commonly used font in newspapers, magazines and books.

NARRATOR: Dr. Legge describes how the results are used:

DR. LEGGE: This test is used in a number of ways. Sometimes it's used by clinicians, eye doctors, ophthalmologists, optometrists. Another use of it is in clinical trials where researchers are testing out some new eye therapy of some sort, whether it's some new treatment for eye disease or some new surgical method, whatever; the typical thing there is to do a test before the treatment, do the test after the

treatment. But often the goal of the therapy is to improve vision so people can perform better in the real world.

NARRATOR: Dr. Legge tells why low vision reading is important to him:

DR. LEGGE: Personally, I have low vision myself; I understand, at a personal level, the challenges faced by people with low vision. It can be hard, it can be challenging, but I think it's possible to do almost anything with low vision.

It's professionally important too, to bring to the notice of the research community the important need for applications of vision science to low vision.

There are going to be millions of people who are going to live their lives with low vision; it's important for researchers to think about how to maximize the quality of life for people with low vision.

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

Narrator: Ken Mills

Writer & Producer: Ken Mills

Produced: March 20, 2017

© 2017 Regents of the University of Minnesota. All rights reserved.
The University of Minnesota is an equal opportunity educator and employer.