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Things You May Not Know about Susan Scollie

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Susan Scollie is currently one of the most famous scientists in pediatric audiology, so it may come as a surprise that there are a few things that most people do not know about her. Susan is widely regarded as a leader in advancing our thinking about pediatric amplification, including research on verification methods, signal processing, and the greatest and best hearing aid prescription for children, the Desired Sensation Level (DSL). She has mentored researchers and other scientists in the field, taught countless droves of audiology students, and has been an invited speaker worldwide. What else could there possibly be to know and appreciate about Susan?

When asked to write this piece describing Susan's impact on our field, I knew that other contributors would probably focus on these widely appreciated accomplishments. However, I want to share how two particular papers that Susan published early in her career profoundly impacted the direction of our

research program at Boys Town National Research Hospital. Susan has published numerous articles during her career, and the two articles I want to highlight are not even in Susan's top ten most-cited articles. When I talk about these articles now, audiologists and hearing scientists often squint and respond with puzzled expressions. However, both of these articles highlight how writing papers that make other scientists think can totally change the direction of a research program.

My first example begins in 1999 when things were very different in pediatric audiology and the world in general. While everyone was listening to NSYNC and losing their minds about the potential collapse of technology related to Y2K, Susan and Richard Seewald quietly published a paper in the *Hearing Journal* entitled "Infants are not average adults: Implications for audiometric testing." At that time, I was an undergraduate at the University of Northern Colorado who was more interested in partying and dating as many future speech-language pathologists as possible than in auditory brainstem response or real-ear-to-coupler differences. However, this article was so influential that it may be one of the only things I read that year that I remember today.

The premise of the article is very simple. Thanks to Susan and her colleagues, the impact of ear-canal acoustics on hearing aid fitting for infants and young children is widely appreciated. Tiny ear canals lead to higher-than-expected sound pressure levels in the ear canal, and these differences need to be accounted for when hearing aids are fitted. What is less appreciated even today, but that Susan and Richard brought to light in their *Hearing Journal* article was that this same coupling that produces higher than expected sound levels in the ear-canal with hearing aid fitting also affects our hearing assessments with infants and children. The implication is that hearing threshold expressed in dB HL for infants and young children often underestimates the amount of hearing loss that children may have because the sound levels in the ear canal during the assessment are much higher in an infant's ear than in the coupler used to calibrate or insert earphones.

When I eventually became a clinical audiologist several years later, the idea that ear-canal acoustics affected our hearing assessments with infants and young children was something that I thought about a lot. It often influenced my clinical decision-making and counselling for children with hearing loss. Even later, when I moved into a career in research, I noticed that many children with mild degrees of hearing loss in a research study we were conducting were not consistently receiving hearing aids while others were. Thinking back to the effects of ear-canal acoustics, I knew that many of these children with mild hearing loss diagnosed at very young ages probably had much greater degrees of hearing loss that were not apparent from the dB HL audiogram. This work led our team to explore using unaided audibility, which accounts for the effects of ear-canal acoustics on thresholds, in place of dB HL thresholds for hearing aid candidacy (McCreery et al. 2020). Our line of thinking was influenced by that memory of Susan's publication in a trade journal over two decades ago.

The second article is probably more widely recognized but also significantly impacted our team's

research. Susan published a paper in Ear and Hearing in 2008 that described predictions of the speech intelligibility index (SII) for children with hearing loss and included age-based proficiency factors (Scollie, 2008). When this paper was published, I was in the Ph.D. program and actively thinking about the directions my own research would take. It’s easy to forget that at that time, speech audibility was mostly considered a technical area of study in speech perception and not widely thought of or used as an outcome measure for hearing aid fitting for children. However, Susan’s paper outlined many scientific issues around using the SII to predict speech recognition using transfer functions derived from children and greatly influenced my dissertation examining audibility transfer functions for nonwords for children with normal hearing (McCreery & Stelmachowicz, 2011).

The implications of my early research on this topic remain questionable, but what I learned during that process that was heavily influenced by Susan’s work spilled over into another project that was launching around the same time. Shortly after finishing my dissertation, I was asked to work as a co-investigator on the Outcomes of Children with Hearing Loss (OCHL) study, a collaboration between the University of Iowa, University of North Carolina, and Boys Town National Research Hospital. The research team was debating how to characterize hearing aid benefit and had been influenced by Susan’s research on speech audibility for children, as well as work by Derek Stiles that examined relationships between aided audibility and language outcomes in his dissertation research at Iowa. The OCHL team decided early in the project to measure aided audibility for our study's children with hearing loss, primarily due to Susan’s research. Other large-scale research studies that were ongoing at the same time often had to rely on variables related to the timing of intervention or degree of hearing loss from the audiogram as predictors of outcomes. Looking back at the results of the OCHL project, some of the most important contributions of that work are related to how hearing-aid fitting quality and aided audibility affect speech recognition, language growth, and academic outcomes.

We are thankful for Susan’s contributions to the field of pediatric audiology and look forward to the next burst of inspiration that we will get from her research.

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