LENA™ FOUNDATION

Case Study

The author, Lisa Eberlein, with her children, Ford and Stella.

My 12-year-old son, Ford, was diagnosed with hearing loss at birth. Like many new parents of children who are deaf or hard of hearing, I was stunned and overwhelmed at first. Gradually, I immersed myself in early interventions and therapies, learning what I needed to know to ensure his access to sound, a rich acoustical environment, and a solid education. Then when Ford was six I had my second child, a girl. My daughter, Stella, was diagnosed with hearing loss as well. I found the news even harder to bear the second time around. Family and friends tried to comfort me by saying, "At least now you know what to expect." "Exactly!" I cried. "That's why I'm so upset! I don't know how I can do it all over again!" Of course, I would.

Early intervention looked pretty much the same back then as it does now. I would be videotaped while interacting with Ford or Stella during half-hour sessions. The taping sessions made me feel like an actor on a stage. I knew my interactions were different from everyday interactions at home. Meanwhile, my children weren't quite sure what was going on and definitely did not act naturally. Adding to my frustration, my husband and I had to wait weeks for the results. I thought, Isn't there a way to capture my family's natural language environment?

In the spring of 2008, I attended one of the quarterly meetings for the Children's Literacy Coalition in Denver. That's when I discovered the LENA System (LENA stands for "Language ENvironment Analysis"). At the event, LENA Foundation Language Research Director Jill Gilkerson, Ph.D., presented the system and explained how it worked.

Essentially, a child wears an unobtrusive LENA digital language processor (DLP) in the front pocket of a special garment. With the DLP, a parent can record up to 16 hours of the child's natural acoustical environment. At the end of the day, the parent hooks up the recorder to a PC. Special LENA software on the PC automatically uploads and processes the data, generating six reports and an assessment. For example, there are reports on child vocalizations, adult words, conversational turns, and (notably) the child's audio environment. The colorful, intuitive bar graph of the audio environment report measures the time and percentage of time that a child is exposed to silence and background sound, noise, TV and electronic sounds, and distant and meaningful speech.

The presentation blew me away. I couldn't believe that the technology actually existed or that it hadn't been created just for kids with hearing loss. Immediately following the presentation, I questioned Dr. Gilkerson

and another LENA representative extensively on the product and explained my perspective as a parent of two children who are hard of hearing. They invited me up to Boulder to share my perspective with others at the LENA Foundation. As hearing loss is a low-incidence disability, I was afraid that LENA wouldn't market the product to the DHH community; therefore, I eventually accepted an offer to join the foundation as a consultant.

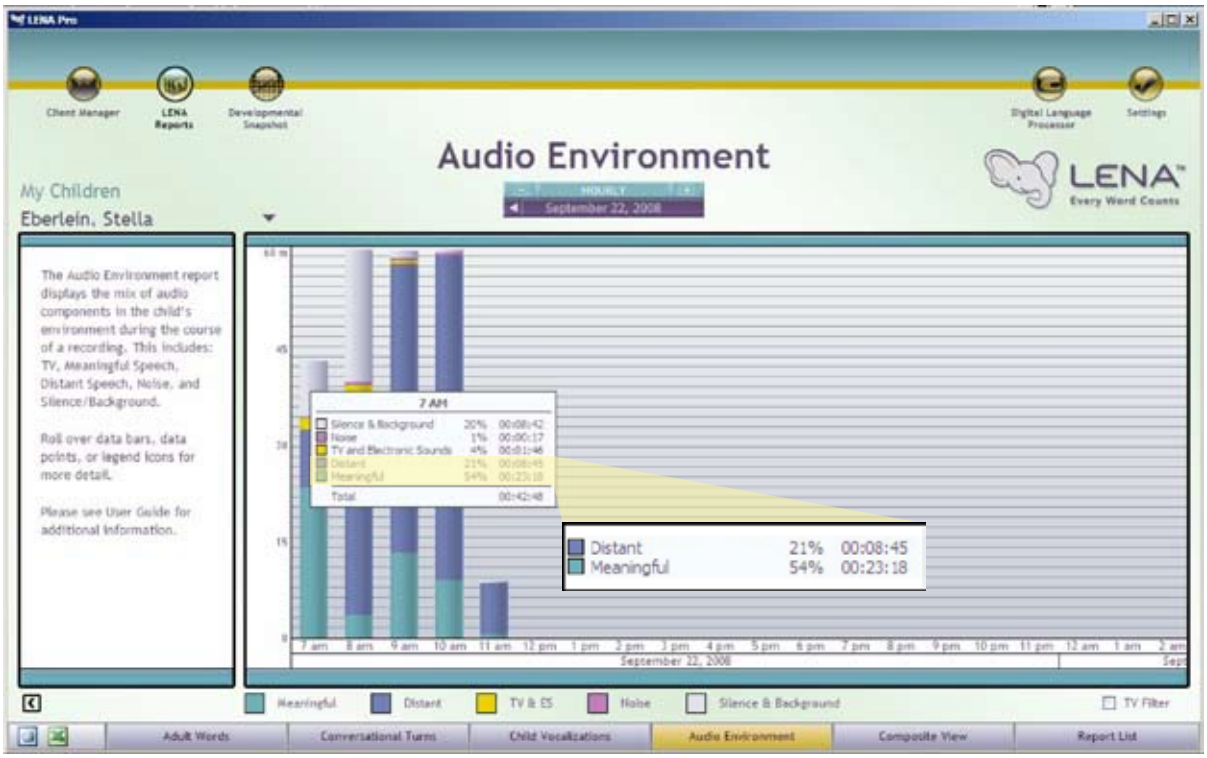
Suddenly I found myself overwhelmed again. Not only was I learning about the LENA System and traveling for the LENA Foundation, but Ford was starting middle school, Stella kindergarten. In the classroom, Ford had used and benefitted greatly from an FM system, and I felt Stella might too. However, Stella's itinerant teacher suggested that her kindergarten classroom simply be outfitted with a sound field system. Super busy and convinced that I was projecting Ford's problems onto Stella, I decided not to push for an FM system.

Regardless, the more familiar I became with LENA and its ability to distinguish distant speech from meaningful speech, the more I was determined to use it to test the quality of the acoustical environment enabled by the sound field system. So one morning in September 2008, I dressed Stella in cute LENA overalls, turned on the LENA DLP, and inserted the device in the special pocket on her chest. I dropped her off at school and told Stella's teacher what I was doing. "No problem," she said.

After picking up Stella at the end of the day, I connected the recorder to my PC and let the LENA Pro software do its work. Stella loved wearing the LENA DLP and listening to her recordings; furthermore, in one of the recordings I could even hear her singing, "I love LENA. I love LENA."

The results were illuminating. As you can see, the hourly Audio Environment report in Figure 1 showed a considerable discrepancy between the quality of speech Stella had been exposed to at home and at school. From 7:00 a.m. to 8:00 a.m., when Stella was at home, LENA estimated that the acoustical environment consisted of 54 percent meaningful speech and 21 percent distant and overlapping speech.

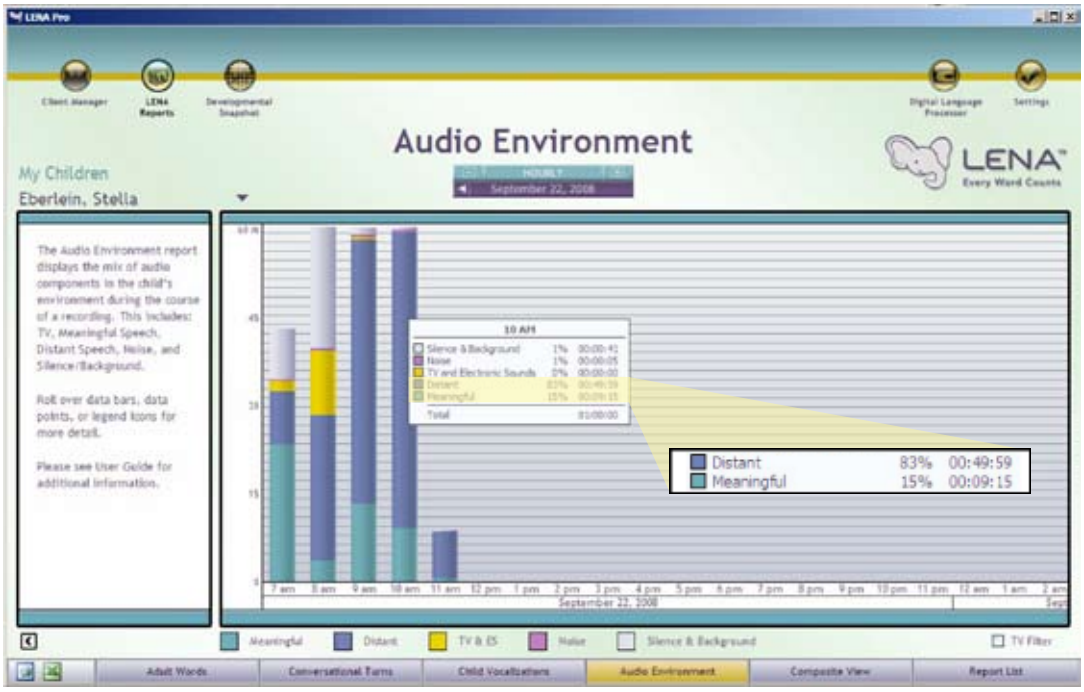
Figure 1.



The hour of 8:00 a.m. to 9:00 a.m. represents Stella's trip from home to school.

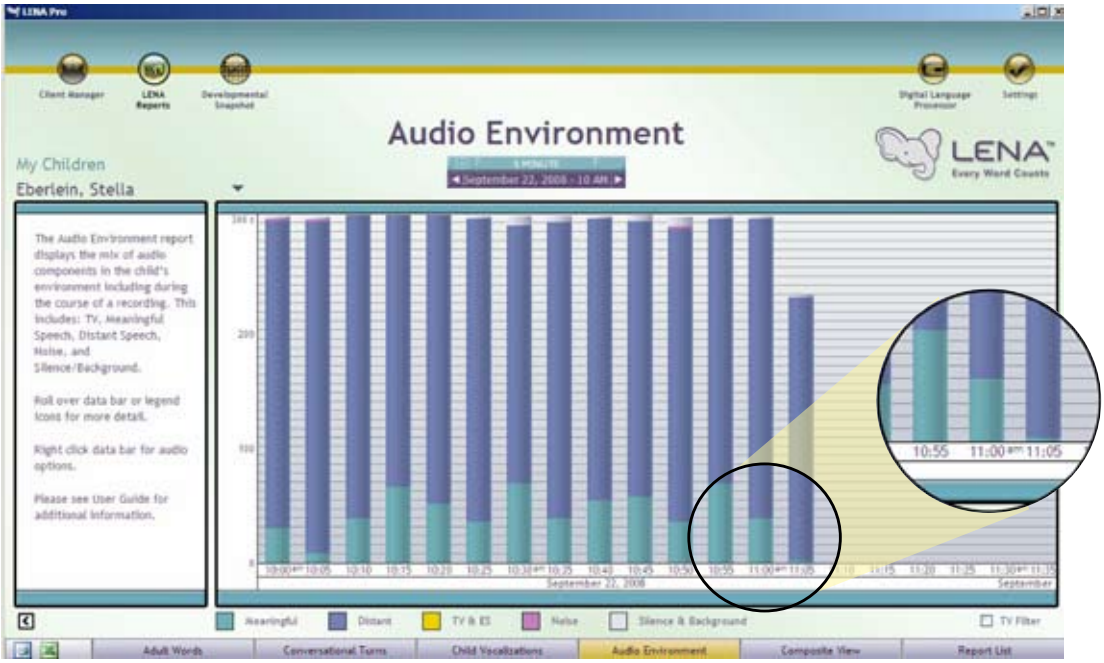
Capturing the period from 10:00 a.m. to 11:00 a.m. at the school, Figure 2 illustrates that the dominance of meaningful speech over distant speech flip-flopped. Conversely, the acoustical environment consisted of 15 percent meaningful speech and 83 percent distant and overlapping speech.

Figure 2.



Toggling the audio environment report from the hourly to the 5-minute view (Figure 3) showed how meaningful speech was such a small part of the classroom environment. This visual aid is also impressive because it shows the 5-minute segment from 11:00 a.m. to 11:05 a.m., the start of my daughter's lunchtime, which featured nearly zero meaningful speech. At this time, my children had become accustomed to turning off their hearing aids to block out the loud dissonance in the lunchroom.

Figure 3.



The graphs captured my concerns clearly, so I decided to take them to my daughter's IEP meeting to support my request for an FM system for Stella. The IEP team was really impressed, oohing and ahhing over the reports. When they saw the distinction between the amount of meaningful speech and distant speech in the audio environment report, the need for an FM system seemed obvious. We all concluded that the sound field system had just made the teacher's voice louder, but her voice was still distant and often drowned out by other auditory input in the room. I had suspected it—but LENA showed it. LENA provided the IEP team with independent, objective information and helped my daughter get the FM system she desperately needed. And that made all the difference.

A powerful new tool for the early screening, diagnosis, research, and treatment of language delays and disorders in children and adults.

For product information, system requirements, and general inquiries, please call toll free: 866.503.9918 or visit our website at www.lenafoundation.org

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