
BU Deaf Studies researchers look for ways to prevent deaf children from being deprived of language / BY ELIZABETH DOUGHERTY

Getting the



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A few years ago, Naomi Caselli stumbled upon her father's faded class picture from the 1960s. He stood in the back, a suited adolescent in a sea of elementary schoolchildren. Caselli, a School of Education assistant professor in the Deaf Studies program, assumed he was a teacher's aide. He wasn't. Her father had been held back.



HE HAD LAGGED BEHIND HIS PEERS FOR A REASON. Raymond Kenney is profoundly deaf in both ears. He was in a class for deaf and hard-of-hearing children, but they didn't teach sign language there. Instead, teachers spent years coaching him to speak using physical and visual cues. Over and over, they sounded out words like "ball," repeating "bah, bah, bah," while holding his hand at their mouths to show him how to mimic the vibrations. "They really wanted him to speak," says Caselli.

By age eight, he knew a few basic words, but he could not speak in sentences and used made-up gestures to communicate with his family.

At age 19 at the National Technical Institute for the Deaf at the Rochester Institute of Technology, he got his first look at American Sign Language (ASL) in practice among other deaf students. Today, he still struggles with reading and expressing himself in written English, frustrations that evoke his childhood, when his ability to communicate was so limited.

"He's a beautiful signer now," says Caselli, a Certified Deaf

◀ Naomi Caselli wants to understand how deaf children under the age of five acquire language.

Interpreter who is hearing but learned ASL alongside spoken English from birth. “But that’s uncommon for people who’ve had a similar experience.”

Today, ASL has been accepted as a full-fledged language with all of the complexity, structure, syntax, and storytelling found in spoken languages. Elementary and secondary school programs for the deaf teach and assess ASL proficiency using accepted measurement tools, some of which were developed at BU.

But language deprivation remains a real problem for deaf children. “Kids are still having much the same experience that my dad did,” says Caselli.

The concern now among researchers like Caselli and Amy Lieberman, an SED assistant professor of Deaf Studies, is what happens before school starts. Approximately 90 to 95 percent of deaf children are born to hearing parents who often don’t know sign language and therefore will likely struggle to teach it before their children enter school. Even among school-age deaf children, estimates based on data from a 2010 survey from Gallaudet University, which specializes in deaf education, suggest that at most 40 percent of families use sign language at home. Given this data, educators in the field worry that a majority of deaf children may be deprived of language.

Exposure to language from birth is essential for the development of thinking skills, according to a range of studies. Without access to language, children have a harder time in school. They also have more difficulty developing a sense of self and others. They even struggle with planning and time management.

So Caselli, Lieberman, and their collaborators are using the tools of linguistics, behavioral psychology, cognitive science, and education to understand how deaf children acquire language and, in turn, how best to teach them.

Language Barriers

One of the biggest challenges for educators and researchers who want to improve deaf education is figuring out how to detect language deprivation. This would not only help researchers understand the scale of the problem but also help them guide deaf children and

their parents to services that can smooth the way to introducing sign language.

A first step, being taken by Caselli, Lieberman, and Jennie Pyers, a visiting faculty member from Wellesley College, is to develop an ASL test for children under five. With new funding from the National Institute on Deafness and Other Communication Disorders, part of the National Institutes of Health (NIH), they plan to work initially with deaf children who have deaf parents. “We want to sort out what vocabulary acquisition looks like under ideal conditions,” says Caselli.

From there, they will study deaf children with hearing parents, who likely face bigger challenges and potential delays as parents learn to sign. “Our goal is to determine where children fall behind and where they don’t, so that we can focus interventions,” she says.

To support this effort, Caselli developed an online visual lexical database for ASL called ASL-LEX. The tool, which won the People’s Choice award (interactive category) in the “Vizzies” Visualization Challenge sponsored by the National Science Foundation and *Popular Science*, documents nearly 1,000 ASL signs, along with information about frequency of use, grammar, and hand movements. The database will also become a repository for information about milestones, such as the age at which children learn different signs. This information, in turn, can become a source for building assessment tools.

Attention-Getters

For parents of deaf children, job one—aside from learning the language itself—is getting the child’s attention. “It seems simple,” says Lieberman, “but parents need to learn how to manage their child’s gaze.”

Deaf babies who learn sign language from their parents learn to manage their attention by the time they reach preschool, according to earlier research by Lieberman. “They look up to see a sign and down to connect the sign to an object,” she says. “They do so in meaningful and purposeful ways.”

Since eye movements reveal a lot about how deaf children process and learn language, Lieberman developed a set of studies using techniques that track eye movements and is continuing this research with a grant from the NIH. She and her research team, which includes both deaf and hearing researchers, are focused on deaf children as young as 18 months and up to 5 years to understand how and when they learn words.

The study will include both deaf children with deaf parents and deaf children with hearing parents. “We want to look at the full spectrum of deaf children, looking carefully at the quantity and quality of language exposure they’re receiving,” says Lieberman. “How do those two measures correlate with the ability to develop visual attention skills and new words?”

Not only will this research help develop milestones for detecting language deprivation, it will also help develop interventions for children who are falling behind. An outcome could be an educational program or tips to help parents manage their child’s gaze. “Without looking,” says Lieberman, “there’s no language.”



▲ ASL-LEX is an online visual database containing nearly 1,000 ASL signs, along with information about frequency of use, grammar, and hand movements. Caselli hopes it will become a repository for data on how and when children acquire sign language.