

[MUSIC PLAYING]

DEREK We knew that there were differences found in cognitive processes in older children who have cochlear implants.
HOUSTON: What we didn't know is when those differences start to emerge. The way we wanted to approach it is to go look at early cognitive processes at a much earlier age and see if those differences still remained even when children, or really infants in this case, were at an earlier point in their language development.

CLAIRE So the study was connected with young deaf infants-- so infants with severe to profound sensorineural hearing
MONROY: loss-- and a group of age-matched typically hearing infants. We did what's called the habituation paradigm. We were looking to see whether there were any differences in visual habituation between the deaf and the hearing infants.

DEREK We really didn't know what we would find. I mean, we really didn't expect necessarily that deaf infants would
HOUSTON: show any difference in this very basic, nonverbal, visual-only habituation task.

CLAIRE So infants sat on their parents lap, and they were just shown objects on a large screen, just colorful objects with
MONROY: no sound. And essentially, they would look at the object for a maximum of 20 seconds. And then as soon as they got bored, they would look away, or after 20 seconds, the object would then disappear and something exciting would happen to regain their attention. And then the same object would be shown again.

And this would happen over and over and over again until they're looking time declined to a certain threshold, what we call the habituation criterion. So what we found was that, in fact, deaf infants did habituate more slowly to the visual stimulus. So they took longer to habituate, which means that it took them more trials to decrease their looking time to these visual objects than the hearing infants.

DEREK On the surface, we wouldn't expect there to be any differences in their visual habituation. However, we did see
HOUSTON: differences in the rate of habituation. So the deaf infants habituated at a slower rate than the hearing infants. To us, it was really just an exploratory study and the findings, we think, are really fascinating.

CLAIRE What we're interpreting these as showing is that there are differences in general cognitive development early in
MONROY: life before advanced language skills start to emerge. So what we think this shows is that the auditory deprivation, or the not hearing from birth, starts to already create differences in general development in the first year of life. We still don't know exactly why there are these differences so early in development. And there's several potential explanations for these findings.

So our next step is to try to look deeper into the underlying factors that could cause these differences. And one way that we're doing that now is to actually look more closely at the interaction between parents and infants for early markers in how they interact with their parents and early communicative behaviors that could shed light on what's underlying these differences.

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