Early Sound Sensations and Language Development

Early language development is influenced by many different genetic and environmental factors over the course of development. Understanding these factors is the focus of the Emory Language Development Study conducted at the Child Development Laboratory at the Emory University School of Medicine. Although data analysis is still on-going, the investigators wanted to share some of the preliminary results regarding the impact of early sound sensations on language development.

In this study, families were recruited in the hospital and seen at 6 months of age to assess the baby’s responses to sound and early language development. To participate in the study, all infants had to pass the newborn hearing exam so we knew that they did not have hearing impairment. At the 6 month follow-up visit, babies were given tests of general development and language skills. Auditory brainstem responses were recorded to clicks placed into the infant’s ear. Babies typically slept during the latter procedure.

Auditory brainstem responses (ABARs) record how the peripheral nervous system responds to hearing the clicks in the ear. Portions of the ear and the auditory nerve carrying the responses to the central brain are responsible for these responses. Two samples were collected on each baby and each sample averaged the baby’s responses to over 1,000 different clicks.

The nervous system’s response to the clicking noise involved several different phases as the message signal was carried from the ear to the central brain. We were able to measure the speed and size of the signal as it traveled through the nervous system and then relate these measures to the child’s language skills at 6 months.
We found that the speed with which the baby’s peripheral nervous system conducted the signal was related to their language development but not in a way that many people would think. Faster responses were not better responses. We found that faster responses at a sensory level were associated with poorer language skills at 6 months. We believe that baby’s with faster sensory responses may not be fully encoding all aspects of the sound, which may interfere with perception of speech sounds needed to acquire language. These results are very exciting and we are looking forward to examining the relationships between these responses and language at 15 and 24 months.

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