

News

Babies tune in to human voices even when asleep

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Photo by Michael Crabtree

In a study published in the journal *Current Biology*, researchers from Institute of Psychiatry (IoP) King's College London have found that babies as young as three months are able to tune in to the sound of our voices and perceive different emotions, even when they are asleep.

Using functional magnetic resonance imaging (fMRI), researchers took brain images of sleeping babies and discovered that special areas in the brain which process sound are more sensitive than previously thought. From very early on in babies' development these special areas respond differently to human and non-human sounds as well as positive, negative and neutral emotions.

Principal Investigator Professor Declan Murphy, IoP at King's said: 'This discovery fundamentally advances our understanding of infant development. It has implications not only for how we view the impact of social environment on the infant brain, but for future research into how brain function and development relates to later difficulties in social communication.'

Author Dr Evelynne Mercure adds: 'Our results suggest that the infant temporal cortex is more mature than previously reported. It is rare to see that specialized areas exist in the brain so early in development.'

Co-author Dr Anna Blasi said 'The human voice is such an important social cue, which might explain why the brain processes it so early - this may represent the very first step in social interaction and language learning.'

The study was the result of a unique collaboration between experts in baby development at Birkbeck College, led by Professor Mark Johnson and leaders in brain imaging and neurodevelopment at the IoP at King's, led by Professor Declan Murphy.

The researchers recorded brain responses while the three to seven month old sleeping babies were played emotionally neutral, positive or negative human sounds, such as coughing, sneezing, laughing or crying, or non-vocal environmental sounds such as toys or water.

The results showed more activation in an area of the temporal lobe known for processing human vocal sounds in adults. In another part of the brain involved in emotion processing in adults, the babies showed a marked increase in response to sad sounds as opposed to neutral ones.

The findings are consistent with earlier evidence that infants can extract subtle information from human speech. Newborns prefer to listen to their mother's voice and their mother tongue. Young infants also differentiate between the voices of men and women, children and adults.

This research in normally developing babies will help researchers see what happens to this particular brain region in babies that go on to develop disorders such as autism, or abnormal social behaviours, in which social communication is affected.

Professor Murphy concludes: 'We are now carrying out more research in this area to help us understand how differences in brain development arise, and if we can use these to accurately identify babies who will on to suffer from disorders such as autism, and if they can be used to help measure the effectiveness of interventions.'

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Blasi et al., Early Specialization for Voice and Emotion Processing in the Infant Brain, Current Biology (2011), doi:10.1016/j.cub.2011.06.009

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