



A natural question for a young musician to explore is: How did I come to have my abilities?

Caroline Meline's class reviews video related to research on babies and their perception of music. PHOTO: PETE CHECCHIA

## Is Music Innate?

Curtis students explore the origins of speech and song in infants.

BY CAROLINE WISEBLOOD MELINE

What do animals and babies have in common? The answer, from evolutionary science, is that neither group can communicate in language, but both groups make patterned sounds. There is an evolutionary connection between the biological mechanisms that enable these nonverbal and preverbal beings to vocalize.

And how do animals and babies figure into the education of a student at the Curtis Institute of Music? As speakers and musicians, Curtis students are possessed of abilities whose origins are under investigation by many kinds of researchers—psychologists, philosophers, linguists, musicologists, neuroscientists, archaeologists, biologists, and more. A natural question for a young musician to explore is: How did I come to have my abilities?

Last spring I offered a course titled *People, Animals, Language, and Music*, designed to explore the evolutionary origins of these key faculties of human beings. As course materials I used a documentary film, *The Music Instinct*, produced by Elena Mannes in 2009, and a book, *The First Word, The Search for the Origins of Language* by Christine Kenneally, published in 2007. Featured in both of those works was a developmental psychologist from the University of Toronto, Dr. Sandra E. Trehub, who turned out to be my second cousin. (The name “Trehub” was the giveaway; it was my grandmother’s maiden name, and I knew we had relatives in Quebec.) I contacted Dr. Trehub, and she agreed to come to Philadelphia to speak to my class and the larger Curtis community.

My cousin told me that when she started her career in the 1970s, no one was investigating the abilities of infants to discriminate sounds such as musical pitches, or aspects of music such as consonance, tempo, and meter. She had begun by researching babies’ acquisition of language,

but she came to realize that there was a gap in knowledge regarding how infants actually perceive sound—nonlinguistic as well as linguistic.

At the time the dominant theory in linguistics was that of Noam Chomsky. He claimed that humans—and only humans—are born with a “language organ,” dedicated to the production of syntax. The part of Chomsky’s theory that claimed language is “uniquely human” meant that researchers were discouraged from thinking about language as having elements found in nonhuman animals, which could be precursors to human language.

As for music, that ability was considered to be uniquely human also, but it was thought to be a cultural acquisition and not an innate faculty. My cousin’s research changed that view. Dr. Trehub told the audience at Curtis about her investigations over more than 40 years into babies’ perception of music. Her specific area of inquiry was the universal aspects of vocal production within varying cultures, such as singing lullabies to infants and speaking to them in “motherese.” But she also has researched the abilities of infants of only a few months old to hear and discriminate changes in specific aspects of musical presentations.



Dr. Sandra Trehub

## SONIC PERCEPTION

To prepare for Dr. Trehub’s visit in April, my students had worked through a 2005 research article co-authored by Erin Hannon and Sandra Trehub, titled “Metrical Categories in Infancy and Adulthood.” In their study on perception of musical meter, the two psychologists aimed to learn whether humans are born with a preference for simple meter, as had been previously theorized. To learn the answer they tested two groups of adults, one from North America and one from Eastern Europe; and one group of infants from North America. The subjects in all of the groups were exposed to phrases of music exhibiting either simple or complex meter, and then they heard alterations to the phrases.

The researchers found that North American adults could distinguish alterations in simple meter but not complex meter. The Eastern European adults could distinguish alterations in both types of meter.

However, those findings did not settle the original question—are humans born with a bias toward simple meter? It was still possible that the Eastern European adults were born with the preference and then overcame it due to their enculturation in complex meter. The key was what happened with the babies. It turned out that the North American infants could distinguish between alterations in both kinds of meter, simple and complex, and this allowed the researchers to conclude that humans are not born with an innate bias toward simple meter.

The larger point, however, was that humans *are* born with the ability to perceive both simple and complex meter in music, but later, due to their exposure to the music of their group, they develop a preference for simple meter and lose their ability to perceive complex meter equally well. The authors concluded that “several lines of evidence are consistent with rich metrical processing in infancy.”

How did working on this article affect the students in the People, Animals, Language, and Music course? “As I was reading the article, it made me think about how much potential we have with our abilities as babies, and how much we lose it as we grow up because of our surroundings, cultures, and limited information,” says student Jinyoung Yoon. “It’s so amazing to think about how many different things I can learn in life.”

Another student, Yuhsin Su, adds, “Everyone is born with this extraordinary ability, and the way we make use of it is important. If we expose the infant to many musical cultures, when they grow up, they will be able to fit into any of them. If we just let them listen to one kind of music, they will [lose] the ability to quickly become familiar with other cultural music.”

A central impression, conveyed by Dr. Trehub’s discussion, with the videos and slides of her work with babies and adults in many parts of the world, was how much very small infants already sense in their earliest exposures to musical expression. Curtis students can reflect on the work they are doing to shape an ability that is natural to humans and other animals. ♦

For over 40 years Dr. Trehub has investigated babies’ perception of music. Her specific area of inquiry was the universal aspects of vocal production within varying cultures, such as singing lullabies to infants.