

# Western Babies Got Rhythm, but They Unlearn It, Study Says

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North American infants are more adept than adults at recognizing complex musical rhythms, according to a recent study. The findings suggest that the ability to discern irregular rhythms could be "unlearned" in cultures that emphasize more simple musical structures.

"Our findings suggest that throughout our lives, as we passively experience ambient music and as we actively listen to it, we actually shape and tune our perceptual processes in a manner that is specific to the music of our culture," said Erin E. Hannon, the study's co-author. Hannon is a psychology doctoral candidate at Cornell University in Ithaca, New York.

North American adults are not "rhythm challenged," the study says. They have plenty of rhythm, but they are accustomed to more regular meter, the music's underlying beat.

In Hannon's test, 50 North American college students and 17 first- or second-generation Bulgarian and Macedonian immigrants listened to Serbian and Bulgarian folk-dance songs. Two tunes had a simple, Western-style meter. Two other songs had a more complex meter that is uncommon in Western music.

The eastern Europeans were able to comprehend the more complex rhythms, though North Americans struggled to do so. Both groups were able to perceive simple beat structures.

"What you find in almost all the world's music is that at some level, there is a regular beat," said Edward Large, who studies the neuroscience and psychology of rhythm at Florida Atlantic University's Center for Complex Systems and Brain Sciences in Boca Raton.

"Music might have a relatively complicated pattern of timing. But you still hear a basic, underlying beat—that framework that formulates the rhythm," Large said. "We [Westerners] have a very strong bias toward hearing periodic regularity. Some say we actively try to impose [that regularity] on an incoming rhythm."

Music with irregular rhythms often includes another more regular beat. Such complex tunes are found in India and Africa as well as in Bulgaria and other European countries.

## Innate Ability

In the study, researchers also tested 64 infants aged six to seven months. Much like the adult group of first- and second-generation Bulgarians and Macedonian immigrants, the infants could distinguish between changes in both simple and complex meters.

Infants, with their limited musical exposure, may lack the cultural biases that adults have learned and thus respond to both familiar and foreign musical rhythms.

"This has also been observed in speech perception, and it suggests that infants start out with general abilities that are modified with exposure to language and music," Hannon, the study co-author, said.

"Infants are good at distinguishing speech sounds, even in languages that they've never heard. When they get older, they lose that ability in languages other than the one that they learn."

## Theory Challenged

Large, the Florida Atlantic University researcher, noted that the study's findings may challenge some previous theories about the innate way in which humans perceive rhythm.

"A number of us, including me, have proposed that the way we perceive these basic beats is that the brain generates oscillations that are excited by periodicity [recurrent intervals] at these different timescales," Large said.

He added, however, that the theory "doesn't explain these [irregular] rhythms from the Balkans ... at least not in a way we've conceived so far."

The researcher notes that numerous studies strongly suggest that humans are biased toward perceiving beats that occur twice a second.

"If you ask people to tap to a piece of music, 90 percent will tap at the beat that's closest to that pace," he said. "The thing that makes [the study's Balkan rhythms] interesting is that at that approximately [half-second] level, they are not regular. At that sweet spot [the rhythm] is not periodic."

"Theorists like myself are going to have to spend some time thinking about this, working out whether these models can explain this or not," he continued. "This study shows an example that's explicitly not like [the theory]. It showed that this may be cultural. That's a challenge."

Hannon and Sandra Trehub of the University of Toronto reported their findings in the January 2005 issue of *Psychological Science*, a journal of the American Psychological Society.

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