Music really is a universal language

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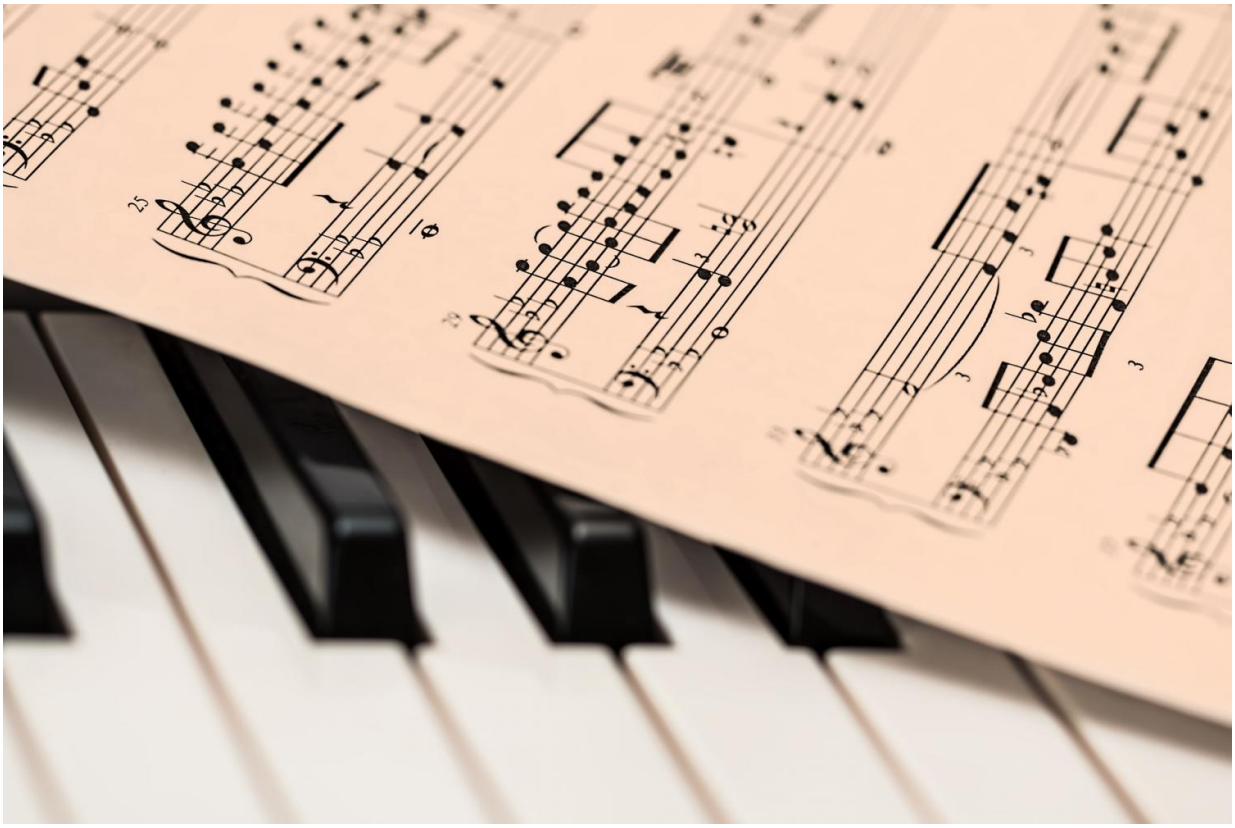

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Every culture enjoys music and song, and those songs serve many different purposes: accompanying a dance, soothing an infant, or expressing love. Now, after analyzing recordings from all around the world, researchers reporting in *Current Biology* on January 25 show that vocal songs sharing one of those many functions tend to sound similar to

one another, no matter which culture they come from. As a result, people listening to those songs in any one of 60 countries could make accurate inferences about them, even after hearing only a quick 14-second sampling.

The findings are consistent with the existence of universal links between form and function in vocal music, the researchers say.

"Despite the staggering diversity of music influenced by countless cultures and readily available to the modern listener, our shared human nature may underlie basic musical structures that transcend cultural differences," says Samuel Mehr at Harvard University.

"We show that our shared psychology produces fundamental patterns in song that transcend our profound cultural differences," adds co-first author of the study Manvir Singh, also at Harvard. "This suggests that our emotional and behavioral responses to aesthetic stimuli are remarkably similar across widely diverging populations."

Across the animal kingdom, there are links between form and function in vocalization. For instance, when a lion roars or an eagle screeches, it sounds hostile to naive human listeners. But it wasn't clear whether the same concept held in human song.

Many people believe that music is mostly shaped by culture, leading them to question the relation between form and function in music, Singh says. "We wanted to find out if that was the case or not."

In their first experiment, Mehr and Singh's team asked 750 internet users in 60 countries to listen to brief, 14-second excerpts of songs. The songs were selected pseudo-randomly from 86 predominantly small-scale societies, including hunter-gatherers, pastoralists, and subsistence farmers. Those songs also spanned a wide array of geographic areas

designed to reflect a broad sampling of human cultures.

After listening to each excerpt, participants answered six questions indicating their perceptions of the function of each song on a six-point scale. Those questions evaluated the degree to which listeners believed that each song was used (1) for dancing, (2) to soothe a baby, (3) to heal illness, (4) to express love for another person, (5) to mourn the dead, and (6) to tell a story. (In fact, none of the songs were used in mourning or to tell a story. Those answers were included to discourage listeners from an assumption that only four song types were actually present.)

In total, participants listened to more than 26,000 excerpts and provided more than 150,000 ratings (six per song). The data show that, despite participants' unfamiliarity with the societies represented, the random sampling of each excerpt, their very short duration, and the enormous diversity of this music, the ratings demonstrated accurate and cross-culturally reliable inferences about song functions on the basis of song forms alone.

In a second, follow-up experiment designed to explore possible ways in which people made those determinations about song function, the researchers asked 1,000 internet users in the United States and India to rate the excerpts for three "contextual" features: (1) number of singers, (2) gender of singer(s), and (3) number of instruments. They also rated them for seven subjective musical features: (1) melodic complexity, (2) rhythmic complexity, (3) tempo, (4) steady beat, (5) arousal, (6) valence, and (7) pleasantness.

An analysis of those data showed that there was some relationship between those various features and song function. But it wasn't enough to explain the way people were able to so reliably detect a song's function.

Mehr and Singh say that one of the most intriguing findings relates to the relationship between lullabies and dance songs. "Not only were users best at identifying songs used for those functions, but their musical features seem to oppose each other in many ways," Mehr says. Dance songs were generally faster, rhythmically and melodically complex, and perceived by participants as "happier" and "more exciting"; lullabies, on the other hand, were slower, rhythmically and melodically simple, and perceived as "sadder" and "less exciting."

The researchers say they are now conducting these tests in listeners who live in isolated, small-scale societies and have never heard music other than that of their own cultures. They are also further analyzing the music of many cultures to try to figure out how their particular features relate to function and whether those features themselves might be universal.

More information: *Current Biology*, Mehr and Singh et al.: "Form and Function in Human Song" www.cell.com/current-biology/f … 0960-9822(17)31675-5 , DOI: 10.1016/j.cub.2017.12.042

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