Study establishes how some songs sound 'right' in different social contexts, all over the world

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Nearly 200 years ago, Henry Wadsworth Longfellow asserted "Music is the universal language of mankind." Today, scientists at Harvard have published the most comprehensive scientific study to determine if the

American poet's words were mere cliché, or cultural truism.

The study was conceived by Samuel Mehr, a fellow of the Harvard Data Science Initiative and research associate in psychology, Manvir Singh, a [graduate student](#) in Harvard's department of Human Evolutionary Biology, and Luke Glowacki, formerly a Harvard graduate student and now a professor of anthropology at Pennsylvania State University.

They set out to answer big questions: Is [music](#) a cultural universal? If it is, which musical qualities overlap across disparate societies? If it isn't, why does it seem so ubiquitous?

To answer these questions, they needed a dataset of unprecedented breadth and depth. Over a five-year period, the team hunted down hundreds of recordings in libraries and private collections of scientists half a world away.

"We are so used to being able to find any [piece of music](#) that we like on the internet," said Mehr, who is now a principal investigator at [Harvard's Music Lab](#). "But there are thousands and thousands of recordings buried in archives that are not accessible online. We didn't know what we would find: at one point we found an odd-looking call number, asked a Harvard librarian for help, and twenty minutes later she wheeled out a cart of about 20 cases of reel-to-reel recordings of traditional Celtic music."

Mehr and Singh added reel-to-reels, vinyl, cassette tapes, CDs, and digital recordings from anthropologists' and ethnomusicologists' private collections to the team's growing discography, combining it with a corpus of ethnography containing nearly 5,000 descriptions of songs from 60 human societies. Mehr, Singh, and Glowacki call this database The Natural History of Song.

Their questions were so compelling that the project rapidly grew into a

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major, international collaboration with musicians, data scientists, psychologists, linguists, and political scientists. Published in *Science* this week, it represents the team's most ambitious study yet about music.

One big answer: Music pervades social life in similar ways all around the world.

"As a graduate student, I was working on studies of infant music perception and I started to see all these studies that made claims about music being universal," Mehr said. "How is it that every paper on music starts out with this big claim but there's never a citation backing that up... Now we can back that up."

They looked at every society for which there was ethnographic information in a large online database, 315 in all, and found mention of music in all of them. For their own ethnographic portion, they collected around 5,000 descriptions of song from a subset of 60 cultures spanning 30 distinct geographic regions. For the discography, they collected 118 songs from a total of 86 cultures, again covering 30 geographic regions.

The team and their researchers coded the ethnography and discography that makes up the Natural History of Song into dozens of variables. They logged details about singers and audience members, the time of day, duration of singing, the presence of instruments, and more details for thousands of passages about songs in the ethnographic corpus. The discography was analyzed four different ways: machine summaries, listener ratings, expert annotations, expert transcriptions.

They found that, across societies, music is associated with behaviors such as infant care, healing, dance, and love (among many others, like mourning, warfare, processions and ritual), and that these behaviors are not terribly different from society to society. Examining lullabies, healing songs, dance songs, and love songs in particular, they discovered

that songs that share behavioral functions tend to have similar musical features.

"Lullabies and dance songs are ubiquitous and they are also highly stereotyped," Singh said. "For me, dance songs and lullabies tend to define the space of what music can be. They do very different things with features that are almost the opposite of each other."

Definitely seeing music as cross-cultural excites Singh because he comes to the Natural History of Song project as a field anthropologist interested in cultural particularities and an evolutionary theorist interested in human universals. For him, the profound patterns of music demonstrate that human culture everywhere is built from common psychological building blocks.

For Mehr, who began his academic life in music education, the study looks toward unlocking the governing rules of "musical grammar." That idea has been percolating among music theorists, linguists, and psychologists of music for decades, but had never been demonstrated across cultures.

"In music theory, tonality is often assumed to be an invention of Western music, but our data raise the controversial possibility that this could be a universal feature of music," he said. "That raises pressing questions about structure that underlies music everywhere—and whether and how our minds are designed to make music."

More information: S.A. Mehr el al., "Universality and diversity in human song," *Science* (2019). science.sciencemag.org/cgi/doi … 1126/science.aax0868