

## Survival of the harmonious

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**Mounting evidence suggests that human beings are hard-wired to appreciate music. What researchers want to know now is why our distant ancestors evolved music in the first place.**

By Drake Bennett | September 3, 2006

IF YOU HAVE SPENT any time near a radio during the past couple months, you've probably heard a song called "Crazy," an oddball R&B ballad about insanity. The track is the result of the collaboration between a singer who goes by the name Cee-Lo and a producer who goes by the name Danger Mouse, and it is absurdly catchy. With Labor Day upon us, it seems safe to call it the song of the summer.

Of course, crooning along or tapping our feet to its loping bass line, it may not occur to most of us to ask why "Crazy" or any song for that matter can so easily insinuate itself into our consciousness. It just sounds good, the way our favorite foods taste good.

But a growing number of neuroscientists and psychologists are starting to ask exactly that question. Researchers at the Montreal Neurological Institute, for example, have scanned musicians' brains and found that the "chills" that they feel when they hear stirring passages of music result from activity in the same parts of the brain stimulated by food and sex.

As evidence mounts that we're somehow hard-wired to be musical, some thinkers are turning their attention to the next logical question: How did that come to be? And as the McGill University neuroscientist Daniel Levitin writes in his just-published book, "This is Your Brain on Music," "To ask a question about a basic, omnipresent human ability is to implicitly ask questions about evolution."

The fact that music is universal across cultures and has been part of human life for a very long time—archeologists have found musical instruments dating from 34,000 BC, and some believe that a 50,000-year-old hollowed-out bear bone from a Neanderthal campsite is an early flute—does suggest that it may indeed be an innate human tendency. And yet it's unclear what purpose it serves.

The evolutionary benefits of our affinity for food (nutrition) and sex (procreation) are easy enough to explain, but music is trickier. It has become one of the great puzzles in the field of evolutionary psychology, a controversial discipline dedicated to determining the adaptive roots of aspects of modern behavior, from child-rearing to religion.

Some evolutionary psychologists suggest that music originated as a way for males to impress and attract females. Others see its roots in the relationship between mother and child. In a third hypothesis, music was a social adhesive, helping to forge common identity in early human communities.

And a few leading evolutionary psychologists argue that music has no adaptive purpose at all, but simply manages, as the Harvard psychologist Steven Pinker has written, to "tickle the sensitive spots" in areas of the brain that evolved for other purposes. In his 1997 book "How the Mind Works," Pinker dubbed music "auditory cheesecake," a phrase that in the years since has served as a challenge to the musicologists, psychologists, and neuroscientists who believe otherwise.

The first thinker to try to find a place for music in the Darwinian order was Charles Darwin. In his 1871 book "The Descent of Man," he argued, "musical notes and rhythm were first acquired by the male or female progenitors of mankind for the sake of charming the opposite sex." Darwin's model was bird song. In many bird species, males sing to impress females. Depending on the species, females will tend toward the males with the broadest repertoire or the most complex or unique songs.

The foremost defender of that model today is Geoffrey Miller, an evolutionary psychologist at the University of New Mexico. Miller argues that in prehistoric communities, singing and dancing might have worked—as they do today in

some Native American cultures—as proxies for hunting and warfare. The ability to come up with imaginative melodies and rhythms would connote intelligence and creativity, and the long, arduous dances would be proof of one's endurance—the sort of traits that a choosy female would like to see in her offspring.

Even today, Miller argues, music retains some of its old procreative roots. Looking at 6,000 recent jazz, rock, and classical albums, Miller found that 90 percent were produced by men, and that those male musicians tended to reach their peak musical production around age 30, which he notes, is also the peak of male sexual activity.

Miller points in particular to the example of Jimi Hendrix. Miller has written that, despite dying at 27, Hendrix had “sexual liaisons with hundreds of groupies, maintained parallel long-term relationships with at least two women, and fathered at least three children in the United States, Germany, and Sweden. Under ancestral conditions before birth control, he would have fathered many more.” To Miller, it was Hendrix's status as a music-maker rather than his fame or charisma that gave him this sexual allure.

Levitin sees some merit in the sexual selection model, but he cautions against seeking support for it in contemporary music. It's important to keep in mind, he argues, that “we're not talking about someone on the subway listening to an iPod or even someone in a concert hall listening to Mahler.” The environment in which music would have evolved would have been much more participatory. Even today, he argues, the Western idea of the concert, which separates performer from audience and music from movement, is an anomaly. In many of the world's languages, Levitin points out, “there's one word for music and dance.”

Others who study the issue are more skeptical. David Huron, a musicologist at Ohio State University, argues that the Darwin model would lead one to expect a differential in musical abilities between the sexes. Typically, he points out, sexual selection leads to “dimorphism,” a divergence in traits between male and female. “It's only the peacock, not the peahen, that has the plumage,” he notes.

“There's no evidence whatsoever that men are more sophisticated than women in terms of the ability to serenade someone from beneath a balcony,” he says. Steven Mithen, an archeologist at England's Reading University, agrees. In his book “The Singing Neanderthals,” published last spring, he writes that the male dominance that Miller sees in the modern recording industry is hardly proof of a difference in innate ability or proclivity. Sexism would explain it just as well.

Indeed, if an alternate explanation is correct, it is women who were the original music-makers. One of the most universal musical forms is the lullaby. “Mothers everywhere soothe infants by using their voice,” says Sandra Trehub, a psychologist at the University of Toronto, “There isn't a culture in which that doesn't happen.”

Trehub has done research showing that mothers tend almost automatically to make their speech more musical when they talk to their babies, even more so in experiments when they are not allowed to touch them. This has led a few thinkers, Trehub included, to speculate that music may have evolved as a baby-calming tool in hunter-gatherer societies. Unlike other primate species, human babies can't simply cling to their mothers' backs, and singing may have been a way for mothers to maintain contact with their children when they had to put them down to do other tasks.

Perhaps the most widely touted explanation, though, is that music arose as a way for groups of early humans to create a sense of community. Among other things, this might explain why music—whether it's singing hymns, school fight songs, or simply “Happy Birthday”—is so often a social experience. The model is neither love song nor lullaby but anthem.

In “The Singing Neanderthal,” Mithen argues that communal music-making does two things. By demanding coordination and basic harmony, it works as a sort of rehearsal for the teamwork required for more high-stakes endeavors like hunting and communal defense. And the mere act of singing and moving in time together helps forge a sense of group identity. As evidence he points to the complex musical rituals of the South African Venda people, but also to the US Army, which sees chanting while marching in unison as a vital part of creating esprit de corps.

There is suggestive research linking music and sociability. Daniel Levitin, for instance, points to the difference between two mental disorders, Williams syndrome and autism. People with Williams are mentally retarded, but at the same time, as Levitin puts it, “highly social, highly verbal, and highly musical.” Autism, on the other hand, while it also often causes mental impairment, tends to make people both less social and less musical.

To Steven Pinker, though, none of this adds up to a convincing case for music's evolutionary purpose. Pinker is not shy about seeing the traces of evolution in modern man-in "How the Mind Works" he devoted a chapter to arguing that emotions were adaptations-but he stands by his "auditory cheesecake" description.

"They're completely bogus explanations, because they assume what they set out to prove: that hearing plinking sounds brings the group together, or that music relieves tension," he says. "But they don't explain why. They assume as big a mystery as they solve." Music may well be innate, he argues, but that could just as easily mean it evolved as a useless byproduct of language, which he sees as an actual adaptation.

And Pinker isn't the only skeptic. Back in April, as part of an experiment led by Levitin to compare the physiological response of performers and listeners, Boston Pops maestro Keith Lockhart conducted the Boston Symphony Orchestra while he, a few musicians, and a portion of the audience were wired with monitors that tracked their heart rate, muscle tension, respiration, and other bodily signals of emotion.

Yet though Lockhart was happy to make himself Levitin's guinea pig, he confesses to be ultimately uninterested in the origins of music.

"It's enough for me to know that music does have a distinct emotional reaction in almost everybody that no other art form can boast of," he says. "I've never particularly wanted to know why that happens."

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