Press Release

Keio University

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Keio University

"Stand by me"?
—120 researchers debate music's evolutionary origins—

An international team led by Associate Professor Patrick Savage of Keio University published a target article in the journal *Behavioral and Brain Sciences* on September 30, 2021, as part of a special feature involving 62 contributions from 120 researchers. The team synthesized evidence from musicology, neuroscience, evolutionary biology, anthropology, archeology, and psychology to provide a "social bonding" hypothesis that explains how the biological capacity to make music arose through gene-culture coevolution by helping individuals to bond in large groups. 109 experts weighed in on this hypothesis and an alternative "credible signaling" hypothesis led by Harvard psychologists. This research represents a model for productive interdisciplinary debate about big questions in human evolutionary history combining the sciences and humanities.

1. Main Points of Research

- Two international teams published dueling theories of music's evolutionary origins
- One team of seven researchers including musicologists, neuroscientists, anthropologists, archeologists, psychologists, and biologists argues for a "social bonding" hypothesis
- A second team of four researchers argues for a "credible signaling" hypothesis
- 109 other researchers weighed in on the two proposals with 60 commentaries – overall opinion favors social rather than individual benefits of music

2. Background of Research

For centuries, researchers have debated how and why the universal human capacity to make and enjoy music evolved. Darwin called music "among the most mysterious faculties with which [humans are] endowed", and proposed that it evolved through sexual selection "for the sake of charming the opposite sex". Others have argued that music makes individuals smarter or healthier, while Harvard psychologist Steven Pinker dismissed music as evolutionarily useless "auditory cheesecake".

3. Content of Research and Results

Savage and his six coauthors instead propose a "social bonding" hypothesis for the evolution of musicality. "We are by no means the first to argue that music brings people together," Savage said, "but this is the first time this social bonding hypothesis has been backed up with detailed evidence from so many fields. It was incredible to write this together with world experts in neuroscience, evolutionary biology, anthropology, archeology, and psychology. As an ethnomusicologist, I had previously shown evidence for the cross-cultural ubiquity of certain types of meters, scales, and performance contexts that support a social bonding hypothesis. But I could never have worked these ideas into a broader theory without them."

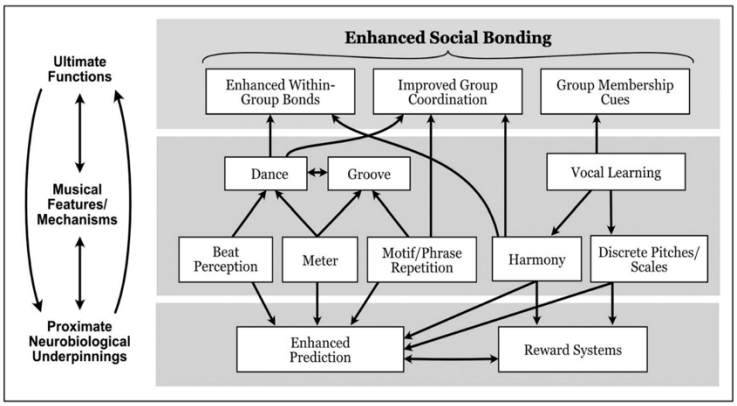

Figure 1. Savage et al's proposed coevolutionary relationships and feedback loops connecting musical features with their proximate neurobiological underpinnings and ultimate evolutionary functions.

The team lay out detailed evidence showing connections between musical features, their proximate neurobiological underpinning, and their ultimate evolutionary functions (Fig. 1). They also outline evidence for experimental studies showing a causal relationship between music, synchrony, and increased social bonding, as well as ethnographic, historical, and archeological evidence suggesting a role for music and social bonding throughout human history. The team weaves this evidence into a scenario in which the capacity to make music may have begun as a byproduct of the evolution of other capacities such as vocal learning, but later coevolved due to its positive effects on social bonding.

A second team led by Harvard's Samuel Mehr countered with their own "credible signaling" hypothesis. Mehr and colleagues criticized the social bonding hypothesis, arguing that "Music does not directly cause social cohesion: rather, it signals existing social cohesion that was obtained by other means." Their proposal also highlights the social power of music, but within the specific contexts of war songs and lullabies where individuals can use music to signal evolutionarily beneficial things like coalition strength or parental commitment.

The two target articles were published in the journal *Behavioral and Brain Sciences*, which commonly invites 20-30 world experts to respond to a single target article. For one of the first times in its history, the journal is publishing two target articles together addressing a single theme (music and evolution), along with 60 commentaries from 109 world experts responding to one or both articles (Fig. 2). The diverse commentators include Grammy-winning jazz pianist Vijay Iyer, current and past presidents of the Society for Music Perception and Cognition (SMPC), philosophers, experts in bird song and whale song, and many more.

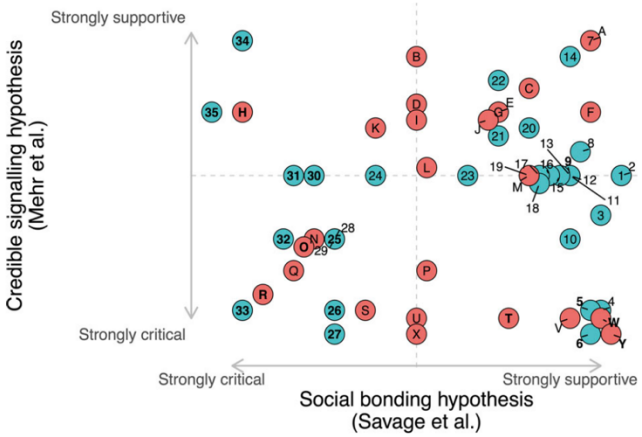

Figure 2. A visual comparison of the 60 commentaries' evaluation of the two target articles.

Many commentators praised the breadth and interdisciplinarity of the proposals. Outgoing SMPC President Elizabeth Margulis wrote that Savage and colleagues' "integration of expertise from different discipline positions allows them to resist the misleading, cartoon-cutout picture of music that can plague scientific inquiry around the subject." Others noted that the two proposals were not really as contrasting as the authors suggested, and were more complementary than mutually exclusive. Still others remained unconvinced by both target articles' arguments against Pinker's "auditory cheesecake" hypothesis – including Pinker himself.

4. Future Developments

Savage and colleagues end their article with a detailed list of predictions for future research including cross-cultural and cross-species tests of their hypothesis. They also hope their work will lead to more applications to improve society. Savage said, "Most of us have experienced the loneliness and isolation of more than a year of social distancing. We hope our theory will help spur investment in music-making, which is vitally needed to help bring us back together to create a more harmonious society – literally and figuratively." In fact, the collaboration first began when the group spontaneously started singing together after a few glasses of wine at a conference. Inspired by the recent Tik Tok sea shanty craze, the researchers have virtually recreated that performance using Tik Tok's virtual "duet" function. Appropriately enough, the song was "Stand By Me" (https://vm.tiktok.com/ZM8JpdLEV).

5. Special notes

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＜Details of Journal Article＞

Title: Music as a coevolved system for social bonding

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