Universals

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Musical universals generally refer to aspects of music that are common across humankind, as opposed to aspects that are culture-specific. The existence of musical universals has implications for diverse areas, such as evolution, aesthetics, and cross-cultural understanding, and has thus been a major focus of debate in ethnomusicology and related disciplines. For reasons of space and expertise, this article focuses on debates about musical universals in the mainstream ethnomusicological canon and their broader connections with concepts of human universals in the Western academic tradition, without intending to diminish the value of alternative approaches developed outside of these traditions.

Scale tunings and other aspects of pitch structure were long assumed to be universal. During the 20th century, ethnomusicology embraced relativism, emphasizing cross-cultural differences in musical meaning and behavior. However, a 21st century renewal of interest by music psychologists has seen a return to an empirical middle-ground that seeks to move beyond universal/relative dichotomies. Instead, recent research attempts to characterize the degrees to which different aspects of music are more or less common cross-culturally, and to understand the biological and cultural factors underlying this spectrum. Existing evidence suggests a statistically universal set of basic building blocks that may reflect pan-human biological constraints, but each culture may combine and develop these building blocks in unique ways to construct music that can mean different things to different listeners.

Historical debate over musical universals

The concept of universals has been debated for millennia and continues in contemporary "nature vs. nurture" debates. From at least the third century A.D., Plato's proposal of universal conceptions of knowledge present at birth was challenged by Aristotle's vision of the mind as a blank tablet (*De anima*) modified by later experience.

Earlier still, Pythagoras proposed a model of musical tuning based on universal mathematical principles. Pythagoras showed that if three strings are plucked and the lengths of the second and third strings are respectively $\frac{1}{2}$ and $\frac{1}{3}$ the lengths of the first, the interval between the first and second strings will be an octave, and the interval between the second and third will be a perfect fifth. Pythagorean integer ratios thus imply a mathematical foundation for a universal basis for musical scales. Similar observations were made in other ancient Eurasian civilizations such as China and India.

After Columbus' voyage to the New World opened an era of colonialism, Western scholars began to be increasingly exposed to and interested in the music and cultures of non-Western peoples. Sometimes, this resulted in romantic ideas of universals bringing peoples together, as in Henry Wadsworth Longfellow's idea of music as "the universal language of mankind". Other times, this was reflected through racism and ethnocentrism.

With the rise of nationalism in the 19th century, there was increasing pressure to show that one's own culture was superior. In the late-19th century German environment in which academic musicology was born, this was reflected in an emphasis on the naturalness of German art music. Thus, emerging evidence of cross-cultural differences was often dismissed either as mistakes or as inferior products of "primitive" cultures at an earlier evolutionary stage. This attitude is shown in the following quote from Hugo Riemann in 1903:

The striking congruencies of the division of the octave into twelve semitones...is a historical fact, which cannot simply be overthrown by a couple of pipes with faulty bores from Polynesia or by the questionable vocal achievements of colored women. (Rehding, 2000:355, translated from Riemann's original German)

Much of the early debate around musical universals revolved around pitch structures related to scale intonation and harmony. During the 17th-19th centuries, a series of scholars, including Jean-Philippe Rameau and Hermann von Helmholtz, developed Pythagoras' ideas about simple integer ratios into a theory of consonance based on the harmonic overtone series. Not only do strings of different lengths vibrate at different frequencies, but any vibrating object produces not only the fundamental frequency we hear but also a series of "overtones" that appear at integer ratios above the fundamental frequency (i.e., the first overtone appears one octave above the fundamental frequency, the second appears a perfect fifth above that, etc.). When multiple pitches are played together as chords, the harmonics of each pitch interfere with one another to different degrees depending on how similar their harmonic series are, such that "consonant" octaves and perfect fifths have minimal harmonic interference, while "dissonant" 2nds and 7ths have high levels of interference.

The first major challenge to the paradigm of musical universals was Alexander Ellis's *On the musical scales of various nations* (1885). Ellis developed a method of precisely measuring musical intervals in "cents" (100 cents per semitone), and took advantage of increasing access to non-Western instruments and musicians to empirically measure the tunings of dozens of instruments from various cultures throughout Eurasia. Although there were some tunings that were fairly consistent cross-culturally - particularly the octave, fourth, and fifth - many intervals did not correspond to Western conceptions of a 12-note semitone scale, and even the perfect fourth and fifth were violated by a Javanese gamelan. Ellis presented this as a fundamental challenge to universal theories of pitch structure:

The final conclusion is that the Musical Scale is not one, not 'natural,' nor even founded necessarily on the laws of the constitution of musical sound so beautifully worked out by Helmholtz, but very diverse, very artificial, and very capricious. (Ellis, 1885:526)

Ellis's empirical approach to the question of musical universals was widely adopted by the "Berlin school" of comparative musicologists, including Carl Stumpf, Erich von Hornbostel, and Curt Sachs, who began to assemble and compare large collections of recordings and instruments from around the world. Comparative musicologists continued to be interested primarily in pitch structures, with Hornbostel proposing a cycle of "blown fifths" to explain regional discrepancies in tuning.

After World War II, there was a rapid movement away from the universalist approaches of German comparative musicologists to embrace concepts of cultural relativism developed by American anthropologists led by Franz Boas. Unlike the "armchair" approach of comparative musicologists, Boasian anthropologists emphasized the importance of understanding cultures on their own terms by immersing oneself in them through extended fieldwork. Boas and his students, including Margaret Mead, Ruth Benedict, and Melville Herskovits, used counter-examples from their fieldwork to challenge many concepts that were assumed to be universal, including social roles such as gender and cognitive processes such as color classification.

Herskovits in turn taught Alan Merriam, one of the founders of the Society for Ethnomusicology, whose book *The Anthropology of Music* (1964) marked a turning point in ethnomusicology. While earlier comparative musicology had generally focused on scales, rhythms, and other acoustic structures that could be recorded, notated, and analyzed from afar, Merriam proposed a three-part model to the study of music in culture that included the domains of musical "behavior" and "concept" in addition to the traditional domain of musical "sound".

Merriam and his contemporaries, such as John Blacking, were critical of the idea of music as a "universal language" because even if there were certain cross-cultural similarities in acoustic structures, these did not necessarily communicate the same meanings to their audiences. For example, although *thāt* (parent-scales) in classical Indian music theory overlap with Western modes, they do not share the happy/sad associations of the Western major/minor distinction, but instead different *rāga* created from each *thāt* are associated with different times of day or seasons. Furthermore, not all listeners respond in the same way even within these cultures - a piece that makes one listener feel happy may make another listener feel sad because it reminds them of a lost loved one.

In the ensuing decades, the concept of universals was debated vigorously by many of the leading figures in the field of ethnomusicology. While there was a range of opinions, the overall tendency was of skepticism toward the usefulness of the concept of universals (the most notable exception coming from Alan Lomax, who argued based on data from his Cantometrics Project for universal relationships between singing style and social structure).

At the beginning of the 21st century, the concept of universals began to gain favor again, spurred in part by the 2001 publication of the first human genome and the confirmation that humans throughout the world have basically the same genetic code. Earlier linguistic research on language universals and universal grammar by Joseph Greenberg and Noam Chomsky became popular in anthropology and evolutionary psychology as ways of conceptualizing a universal human nature characterized by an "adapted mind".

This renewed interest in universals led to a new generation of psychologists such as Steven Brown and Aniruddh Patel interested in the ways music may help our understanding of human evolution, partly due to the many similarities and differences between music, language, and non-musical arts. Drawing on inspiration both from earlier comparative musicologists and from later ethnomusicologists such as Bruno Nettl, Brown and ethnomusicologist Joseph Jordania published *Universals in the world's musics* (2013), listing 70 putatively universal features of music spanning not only acoustic domains such as pitch and rhythm, but also non-acoustic domains of behavior and concept. Brown's student, Patrick Savage, subsequently led an interdisciplinary attempt to empirically test many of these 70 features on a global sample of 304 recordings, publishing evidence for many statistical universals in *Statistical universals reveal the structures and functions of human music* (2015).

Types and degrees of musical universals

Much of the confusion revolving around the universals debates involves the varying ways in which universals are defined and conceptualized. For instance, many ethnomusicologists believe in the universal communicative power of music, but dislike the description of music as a "universal language" because it implies a direct translation of musical sound to meaning that doesn't hold even for individuals within the same culture, let alone cross-culturally.

Questions about musical universals are intrinsically linked to unresolved questions about how to define music. Although all cultures seem to have something comparable to the Western concept of music, many don't have a single term that translates directly. For example, the Persian word *musiqi*, although it shares the same historical roots as the English word "music", refers primarily to instrumental music and specifically excludes sung Quran recitation that many Westerners consider musical.

Another terminological problem involves defining where to draw the line between absolute universals, statistical universals, and culturally-specific features. Few, if any, aspects of music are likely to be absolute universals if we accept compositions such as John Cage's *4'33"* (which consists of a person sitting silently at a piano) as "music". Even within more traditional musical cultures, it is usually possible to find exceptions to many of the most commonly cited universals - some ritual music in Papua New Guinea uses neither discrete pitches nor discrete meters, and some people simply can't hear music. Defining as universal any aspect that is present

somewhere within a culture leads to further difficulties in defining what constitutes a culture, and how frequent a feature needs to be within a culture to qualify as present.

On the other hand, if universals are conceptualized statistically based simply on numerical predominance or correlation, then it becomes necessary to control for the historical effects of cultural diffusion and contact (a challenge known in anthropology as "Galton's problem"). Otherwise, one might be led to identify Indo-European languages or Western pop music as "universal" because they are now globally dominant, although this global spread simply reflects the recent spread of Western people and culture through colonialism and globalization.

There is still no perfect way of controlling for such effects, but anthropologists such as George Murdock have tried to mitigate them through regional sampling strategies since the mid-20th century. In the 21st century, scientists studying cultural evolution, such as Mark Pagel and Ruth Mace, have also adopted phylogenetic comparative methods originally developed by evolutionary biologists to control for historical relationships among species.

Savage and colleagues utilized both regional sampling and phylogenetic comparative methods to identify 18 statistically universal features of music. These features spanned various domains, including pitch (e.g., scales consisting of seven or fewer discrete pitch classes), rhythm (e.g., duple meters), form (e.g., short phrases less than nine seconds long), instrumentation (e.g., vocal music), performance style (e.g., chest voice), and social context (e.g., performance in groups and by males). In addition to finding individual features that were statistically universal, they also found statistically universal relationships between 10 different features (e.g., dancing, percussion, and repetitive motifs and phrases are all more likely to appear in group music containing a regular beat).

Many universals are likely to have fairly low-level explanations. For example, phrase length is presumably limited at least in part by basic constraints on lung capacity shared with speech and animal vocalizations. Others, such as the tendency to perform in synchronized groups, are more specific to human music, and may thus reflect biological adaptations for music. Yet universals do not necessarily imply direct biological causation - the global dominance of male musicians in public performances is unlikely to be due to innate differences in musicality, but rather to widespread patriarchal restrictions on female performance.

Ultimately, we still have only limited evidence for which aspects of music are more or less common cross-culturally, and why that might be. Many of the most interesting putative universals regarding musical behaviors and concepts (e.g., mode/emotion associations, religious/ritual functions) are hardest to explore because they require an understanding of the interactions between the psychoacoustic, biological, and social mechanisms that may facilitate them. Growing interest in interdisciplinary collaboration between ethnomusicology and the sciences gives hope for more nuanced studies of such mechanisms that go beyond universal/relative dichotomies. Even after millennia of debate, musical universals remain a fruitful avenue for the study of music and culture today.

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See Also: Anthropology and ethnomusicology; Cognition; Comparative musicology; Defining music; Music and evolution.

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