Music perception: No strong evidence to reject innate biases

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McDermott *et al.* (*Nature* **535**, 547–550; 2016) used a cross-cultural experiment to show that an isolated South American indigenous group, the Tsimane', exhibit indifference to musical dissonance. The study acts as an important counterweight to common beliefs that musical preferences reflect universal, mathematically based harmonic relationships that are biologically determined by low-level perceptual mechanisms. While we applaud their cross-cultural approach, the limited number of populations studied (n=5) makes it difficult to draw strong conclusions about causal processes. In particular, the conclusion that consonance is thus "unlikely to reflect innate biases" seems too strong, as innateness does not require complete universality.

Exceptions are always found in any phenomenon as complex as human music. Indeed, our own global analysis of traditional music found dozens of aspects of music that were common cross-culturally, but none that were absolutely universal without exception (Savage *et al. Proc. Natl. Acad. Sci. USA* **112**, 8987-8992; 2015). We showed a consistent tendency to avoid dissonance, yet we still found many examples of sustained dissonance in Western and non-Western music (e.g., Eastern European harvest songs, Papua New Guinean lullabies).

Such trends and exceptions are not necessarily indicative of the degree of innateness of aspects of music (which, like other domains of culture, likely reflects some combination of nature *and* nurture). For example, humans and other animals display an innate aversion to bitter and sour foods, but these can be overridden by cultural conventions and developmental experience (Chandrashekar *et al. Nature* **444**, 288-293; 2006). Diversity in musical perception and production could emerge in the context of weak cognitive biases or relaxation in selective pressures (such as the unusual absence of group performance among the Tsimane'). Broader cross-cultural studies of both perception and production of music and other aspects of human behavior (including cultural evolutionary and developmental frameworks) will be needed to clarify the roles of nature and nurture in shaping human diversity.

1. McDermott, J. H., Schultz, A. F., Undurraga, E. A. & Godoy, R. A. Indifference to dissonance in native Amazonians reveals cultural variation in music perception. *Nature* **535**, 547–550 (2016).
<http://www.nature.com/nature/journal/v535/n7613/full/nature18635.html>
2. Savage, P. E., Brown, S., Sakai, E. & Currie, T. E. Statistical universals reveal the structures and functions of human music. *Proc. Natl. Acad. Sci. USA* **112**, 8987–8992 (2015).
3. Chandrashekar, J., Hoon, M. A., Ryba, N. J. P. & Zuker, C. S. The receptors and cells for mammalian taste. *Nature* **444**, 288–293 (2006).