

In [PLoS One](#), two researchers from the [Duke Institute for Brain Science](#), Kamraan Z. Gill and [Dale Purves](#), publish an article providing "A Biological Rationale for Musical Scales" and freely available [here](#).

Abstract: Scales are collections of tones that divide octaves into specific intervals used to create music. Since humans can distinguish about 240 different pitches over an octave in the mid-range of hearing, in principle a very large number of tone combinations could have been used for this purpose. Nonetheless, compositions in Western classical, folk and popular music as well as in many other musical traditions are based on a relatively small number of scales that typically comprise only five to seven tones. Why humans employ only a few of the enormous number of possible tone combinations to create music is not known. Here we show that the component intervals of the most widely used scales throughout history and across cultures are those with the greatest overall spectral similarity to a harmonic series. These findings suggest that humans prefer tone combinations that reflect the spectral characteristics of conspecific vocalizations. The analysis also highlights the spectral similarity among the scales used by different cultures.

Read also the [press release](#) from the Duke Institute entitled "The Biological Link Between Music and Speech," reporting research showing that the musical scales most commonly used over the centuries are those that come closest to mimicking the physics of the human voice, and that we understand emotions expressed through music because the music mimics the way emotions are expressed in speech.