

Vowels, Musical Intervals, and Alpine Yodeling

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1 Vowels and musical intervals: Correspondences in the inventory size

All forms of singing as well as speech comes about in syllables, and the sound (sonority) of syllables comes by their vowels. Thus we expected correspondences between the inventories of vowels and musical intervals across cultures and found them at least in the corners: Lower limit, upper limit, and the 5 vowel system and the pentatonic scale as the most frequent pattern (Fenk-Oczlon & Fenk, to appear).



Vowel systems

- most languages have 5 vowels (Crothers 1978); different authors claim either 6 or 7 vowels as the next most frequent inventory

- a minimum of 3 and a maximum of 12 vowels (Crothers 1978)

Musical intervals

- pentatonic (5-tone) scales are used more widely than any other formation. It is, depending on the source, either followed by the hexatonic (6-tone) scale or by the heptatonic (7-tone) scale.

- 3 tones seem to mark a lower limit (Nettl 2000) and the chromatic (12-tone) scale an upper limit (Burns 1999)

2 Vowels and musical pitches: Correspondences between vowels' F2 and melodic direction

A more detailed and empirical search for related coincidences was inspired by Hughes' (2000) finding that acoustic-phonetic features of vowels are used in almost any culture as a mnemonic system for transmitting or representing melodies. For instance in *shoga*, the Japanese mnemonic system, a succession of the vowels [i], showing the highest frequency in F2, and [o] was most often accompanied by a succession of high and low pitch.



Vowels and Alpine yodeling

Having in mind the sound and vowel patterns of some Alpine yodelers and the freedom of yodelers in combining lexically meaningless syllables with successions of notes, we assumed that this type of music is composed according to the very same principle. Thus we studied all of the monophonic yodelers (n = 15) in Pommer's collection from 1893. The results make inferential statistics unnecessary: In 118 out of 121 cases of a syllable containing an [o] following a syllable containing an [i] the melody descended; in one case the melody raised, in two cases the pitches stayed at the same. And in the 133 instances of an [o]→[i] succession the melody ascended with only one exception (equal pitch). Instances of an [i] followed or preceded by other vowels were less frequent but offered the same picture: one exception in 44 cases of an [i]→[a] succession, and no exceptions in 10 cases of [a]→[i] and in 6 cases of [u]→[i]. It seems that this iconic principle can also be found in the yodelling-like refrains of "Gstanzln".

3 Evolutionary perspectives

The above mentioned parallels need not be explained on evolutionary grounds but may contribute to the understanding of the emergence of language and music: language descending from music, or music from language, or both from a common precursor as described in Brown's (2000) musilanguage model?

Singing without words – as in certain Arapaho songs Nettl (1956), in many

utterances of our infants, and in yodeling – is cognitively less demanding than the use of a more or less arbitrary code. And it is more plausible to assume that singing prepared the vocal tract for speech than the other way round. Thus we are sympathetic with Morley's (2003:149) assumption of a "progressively increasingly complex proto-language based on tone-dominated affective social utterances." The most archaic singing, as described in Nettl (1956), may serve as a model: Simple musical phrases repeated, modified, and repeated again, are an appropriate production system as well as an ideal carrier current system for transmitting symbols, i.e. elements of a coding system associated with particular meanings by virtue of their rule-based use. This model also sheds some light on the key role of the vowel system: sound and color are inherent properties of vowels, and in speech – the specialist for referential meaning (Brown 2000) – this sound diminished as compared with a less specialized, "half-musical" (Jespersen 1895) precursor of song and speech.

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