What is vocal timbre in music

For the disambiguation, see Timbre. Not to be confused with Wood. The quality of the note or sound or spectrogram of the tone of the first second of the suspended E9 chord played on the Fender Stratocaster guitar. Below is the E9 suspended audio chord: In music, color (/tæmbər, tɪm-/ TAM-bər, TIM-, French: [tɛ̃bʁ]), also known as tone color or tone quality (from psychoacoustics), the sound quality of the note, sound or tone is perceived. Timbre distinguishes different types of sound production, such as chorus voices - and musical instruments; string instruments, wind instruments and percussion instruments. It also allows listeners to distinguish between different instruments in the same category (e.g. oboe and clarinet, both wood wind instruments). In simple terms, color is what makes a musical instrument or human voice have a different sound from another, even when they play or sing the same note. For example, this is the difference in sound between a guitar and a piano playing the same note at the same volume. Both instruments may sound evenly relative to each other because they play the same note, and when playing at the same amplitude level, each instrument will still sound distinct with its own unique tone color. Experienced musicians are able to distinguish different instruments of the same type based on their different colors, even if these instruments play notes on the same basic pitch and volume. The physical characteristics of sound that determine color perception include the frequency spectrum and the envelope. Singers and instrumental musicians can change the color of the music they sing/play using different singing or playing techniques. For example, a violinist can use different bowing styles or play on different parts of the string to get different colors (e.g. sul tasto creates a light, airy tone, while sul ponticello gives a sharp, even and aggressive tone). On electric guitar and electric piano, performers can change color using effects units and graphic equalizers. Synonyms Tone quality and tone color are synonymous with hue as well as texture assigned to a single instrument. However, the texture of the word can also refer to the type of music, such as many intertwined melodic lines compared to the melody sung in the company of sub-chords. Hermann von Helmholtz used the German Klangfarbe (tone color), and John Tyndall proposed a translation into English, clangtint, but both terms were rejected by Alexander Ellis, who also discredites the register and color for their pre-existing English meanings (Erickson 1975, 7). The sound of a musical instrument can be described in words such as light, dark, warm, sharp and other terms. There are also noise colors such as pink and white. In visual representations sound, the color corresponds to the shape of the image (Abbado 1988, 3), while the volume corresponds to the brightness; the stroke corresponds to the y-shift spectrogram. The asa definition of acoustical society of america (ASA) acoustic terminology definition 12.09 hue describes it as this auditory attribute, which allows the listener to assess that two non-identic sounds, similarly presented and of the same volume and height, are different, adding, Color depends primarily on the frequency spectrum, although it also depends on the sound pressure and time characteristics of the sound (Acoustical Society of America Standards Secretariat 1994). Attributes Many commentators have tried to spread the color over the attributes of the component. For example, J. F. Schouten (1968, 42) describes elusive color attributes as defined by at least five major acoustic parameters that Robert Erickson (1975, 5) finds scaled to the concerns of much contemporary music: The range between tone and noiselike nature of Spectral envelopes time in terms of height, duration and decay (ADSR, which means attack, distribution, maintenance, release) Changes in both the spectral (control-glide) and base frequency (micro-intonation) prefix, or the beginning of the sound, completely unlike the resulting vibrations A persistent example of tonal sound is a musical sound that has a specific pitch, such as pressing a key on a piano; a noise sound would be white noise, a sound similar to that produced when the radio is not tuned to the station. Erickson (1975, 6) gives a table of subjective experiences and related physical phenomena based on Schouten's five attributes: Subjective tonal nature of the target, usually pitched by The Periodic Noisy Sound, with or without some tonal characters, including noise noise rustle, including random pulses characterized by rustling time (average interval between pulses) Coloration Spectral envelope Beginning/end Physical growth and decay time Color glide or glide control Changing spectral envelope Microintonation Small change (one up and down) in vibrato frequency Tremolo Amplitude modulation frequency Modulation Attack Prefix Final Sound Suffix See also psychoactic evidence below. Harmonic Further Information: Fourier transforms the harmonic spectrum The richness of the sound or note produced by a musical instrument is sometimes described in terms of the sum of different frequencies. The lowest frequency is called the base frequency, and the height it produces is used to name the note, but the base frequency is not always the dominant frequency. The dominant frequency is the frequency that is most often audible and is always a multiple of the base frequency. For example, the dominant frequency for a transverse flute is twice the base frequency. Other frequencies are called base frequency subtexts, which can include harmonic and partial frequencies. Harmonics are multiples of basic frequency numbers such as ×2, ×3, ×4, etc. Partial are other overtones. Sometimes there are also subharmonics in numbers with a base frequency. Most instruments produce harmonic sounds, but many instruments produce partial and non-harmonic tones, such as plates and other instruments with unspecified ground. When you play a tuning note in an orchestra or concert band, the sound is a combination of 440 Hz, 880 Hz, 1320 Hz, 1760 Hz and so on. Each instrument in an orchestra or concert ensemble creates a different combination of these frequencies, as well as harmonic and subtext. Sound waves of different frequencies overlap and combine, and the balance of these amplitudes is the main factor characteristic of each instrument. William Sethares wrote that it is the intonation and western equal hardened scale that are associated with the harmonic spectrum/colour of many Western instruments in the same way that the inharmonic colour of the Thai renate (a xylophone-like instrument) is associated with the seven-tone scale of the pelog in which they are tuned. Similarly, the inharmonic spectre of Balinese metallophones, combined with harmonic instruments such as stringed rebab or voice, are associated with five notes near the equal scale of hardened slendro commonly found in Indonesian gamelan music (Sethares 1998, 6, 211, 318). Envelope Signal and its envelope marked in red The color of sound is also highly dependent on the following aspects of its envelope: attack time and features, decay, support, release (ADSR envelope) and transients. So these are all common controls on professional synthesizers. For example, if someone receives an attack with the sound of a piano or trumpet, it is more difficult to correctly identify the sound, because the sound of a hammer hitting the strings or the first blast of the player's mouthpiece on the mouthpiece of the trumpet are very characteristic of these instruments. The envelope is the general structure of the sound amplitude, so-called, because the sound simply fits inside the envelope: what it means should be clear from the display of the time domain almost any interesting sound, magnified enough that the entire course is visible. In the history of music, instrumental colour played an increasingly important role in the practice of arrangement in the 18th and 19th centuries. Berlioz (Macdonald 1969, 51) and Wagner (Latham 1926,[page needed]) made a significant contribution to its development in the 19th century. For example, Wagner's sleep theme from Act 3 of his opera Die Walküre, has a descending chromatic scale that goes through a range of orchestral colors. First, wooden windmers (flute, by oboe), then the massed sound of strings with violins carrying the melody, and finally brass (French horns). Wagner Sleep's music from Act 3 Die Walküre Wagner Sleep music from Act 3 die WalküreDebussy, which he composed in the last decades of the 19th and early 20th centuries, was considered to further enhance the role of colour: To a clear extent, Debussy's music raises the colour to unprecedented structural status; already in Prélude à l'après-midi d'un fauna color flute and harp reference functions (Samson 1977, p. 195). Mahler's approach to arrangement illustrates the growing role of diverse colors in early 20th century music. Norman Del Mar (1980, 48) describes the following passage of Scherzo's movement of his Sixth Symphony, as a seven-bar link with a trio consisting of an extension in the diminuendo of the repeated Ace... although now it grows in successive stacked octaves, which also leap-frog from Cs added to the Ace. The lower octaves then fall off and only cs remain so as to dovetail with the first oboe trio expression. During these strips, Mahler transmits repeated notes through a range of instrumental colors, mixed and single: starting with the horns and strings of the pizzicato, progressing through the trumpet, clarinet, flute, piccolo and finally, oboe: Mahler, Symphony No. 6, Scherzo, Figure 55, bars 5-12 Mahler, Symphony No. 6, Scherzo, Figure 55, bars 5-12 See also Klangfarmelodie. In rock music since the late 1960s. For example, in heavy metal music, sonic impact strongly amplified, heavily distorted power chord played on electric guitar by very loud guitar amplifiers and rows of speaker cabinets is an essential part of the musical identity style. It was not possible to take a heavily reinforced part of the electric guitar and replace it with the same notes played on the piano or squeaque organs. [citation needed] Psychoacoustic evidence Often listeners can identify the instrument, even on different pitches and volumes, in different environments and with different players. In the case of clarinets, acoustic analysis shows runs irregular enough to suggest three instruments, not one. David Luce (1963, 16) suggests that this means that [C]ertain strong regularity in the acoustic wave of the above instruments must exist, which are immutable with respect to the above variables. However, Robert Erickson claims that there are some regularities and do not explain our ... recognition and identification. It suggests borrowing the concept of subjective constancy from the study of vision and visual perception (Erickson 1975, 11). Psychoacoustic experiments since the 1960s have tried to explain the nature of colour. One method play pairs of sounds to listeners and then use a multidimensional scaling algorithm to aggregate their differentity ratings into a color space. The most consistent results of such experiments are such that the brightness or distribution of spectral energy (Grey 1977), and bite, or speed and synchronization (Wessel 1979) and growth time (Lakatos 2000), attack are important factors. Tristimulus color model The tristimulus concept comes from the world of colors, describing how three process colors can be blended together to create a given color. Similarly, the musical tristimulus measures the harmonic mixture in a given sound, grouped into three sections. It is basically a proposal to reduce the huge number of parts of sounds, which in some cases can be tens or hundreds, up to just three values. The first tripartite measures the relative weight of the first harmonic; the second tripartite measure measures the relative weight of the second, third and fourth harmonics put together; (a) the third tripartite measure measures the relative weight of all other harmonics (Peeters 2003; Pollard and Jansson 1982,[page needed]): More evidence, research and conclusions will be needed for this kind of representation, in order to approve it. T 1 = 1 ∑ h = 1 H and h T 2 = a 2 + a 3 + a 4 ∑ h = 1 H and h T 3 = ∑ h = 5 H and h ∑ h = 3 1 H a h {\displaystyle T_{1}={\frac {a_{1}}{\sum _{h=1}^{H}{a_{h}}}}\qquad T_{2}={\frac {T_{2} a_{2}+a_{3}+a_{4}}{\sum _{h=1}^{H}{a_{h}}}}\qquad T_{3}={\frac {\sum _{h=5}^{H }{a_{h}}}{\sum _{h=1}^{H}{a_{h}}}}} The term brightness is also used in discussions about sound tones, approximately analogy with visual brightness. Timbre scientists consider brightness to be one of the perceptually strongest differences between sounds (Wessel 1979), and formalize it acoustically as an indication of the amount of high-frequency content in sound, using a means such as a spectral agent. See also References Abbado, Adriano (1988). Perceptual correspondence: animation and sound. The work of Ms. Cambridge: Massachusetts Institute of Technology. Acoustical Society of America Standards Secretariat (1994). Acoustic terminology ANSI S1.1–1994 (ASA 111-1994). American National Standard. ANSI / Acoustical Society of America. American Standards Association (1960). American Standard Acoustic Terminology. New York: American Standards Association.CS1 maint: ref=harv (link) Del Mar, Norman (1980). Mahler's Sixth Symphony: Study. London: Eulenburg. Dixon Ward, W. (1965). Psychoacutics. In audiometry: Rules and Practices, edited by Aram Glorig, 55. Baltimore: Williams & Wilkins Co. Reprint, Huntington, New York: R. E. Krieger Pub. Co., 1977. ISBN 0-88275-604-4. Dixon Ward, W. (1970) Musical perception. In the Foundations of Modern Auditory Theory vol. 1, edited by Jerry V. Tobias, [page needed]. York: Academic press. ISBN 0-12-691901-1.

Erickson, Robert (1975). The structure of sound in music. Berkeley and Los Angeles: University of California Press. ISBN 0-520-02376-5.CS1 maint: ref=harv (link) Gray, John M. (1977). Multidimensional perceptual scaling of musical colors. Journal of acoustical Society of America 61(5):1270–77. doi:10.1121/1.381428 Lakatos, S. (2000). Common perceptual space for harmonic and percussion colors. Perception & Psychophysics 62(7):1426–39. PMID 11143454. Latham, Peter. (1926) Wagner: Aesthetics and Orchestration. Turntable (June):[page needed]. Luce, David A. (1963). Physical correlations nonpercussive Musical Instrument Tones, dissertation. Cambridge: Massachusetts Institute of Technology. McAdams, Stephen and Albert Bregman (1979). Listen to music streams. Computer Music Journal 3, No. 4 (December): 26-43, 60. Macdonald, Hugh. (1969). BBC Music Guides. London: British Broadcasting Corporation. 978-0563084556. Peeters, G. (2003) A large set of audio features or sound description (similarity and classification) in the CUIDADO project. [full citation needed] Pollard, H. F., and E. V. Jansson (1982) Tristimulus method of musical color specification. Acustica 51:162–71. Samson, Jim (1977). Music in Transition: Study of Tonal Expansion and Atonality, 1900-1920. New York: W. W. Norton & Company. ISBN 0-393-02193-9.CS1 maint: ref=harv (link) Schouten, J. F. (1968). Perception of color. In reports from the 6th International Acoustics Congress, Tokyo, GP-6-2, 6 toms, edited by Y. Kohasi,[full needed source]35-44, 90. Tokyo: Maruzen; Amsterdam: Elsevier. Sethares, William (1998). Tuning, Timbre, Spectrum, Scale. Berlin, London and New York: Springer. ISBN 3-540-76173-X. Wessel, David (1979). Low Dimensional Control of Musical Timbre. Computer Music Journal 3:45–52. The rewritten version, 1999, as Timbre Space as a Musical Control Structure. Source