Vocal range

Vocal range is the measure of the breadth of pitches that a human voice can phonate. Although the study of vocal range has little practical application in terms of speech, it is a topic of study within linguistics, phonetics, and speech and language pathology, particularly in relation to the study of tonal languages and certain types of vocal disorders. However, the most common application of the term "vocal range" is within the context of singing, where it is used as one of the major defining characteristics for classifying singing voices into groups known as voice types.\[^{[1]}\]

Singing and the definition of vocal range

While the broadest definition of vocal range is simply the span from the lowest to the highest note a particular voice can produce, this broad definition is often not what is meant when "vocal range" is discussed in the context of singing. Vocal pedagogists tend to define the vocal range as the total span of "musically useful" pitches that a singer can produce. This is because some of the notes a voice can produce may not be considered usable by the singer within performance for various reasons.\[^{[2]}\] For example, within opera all singers must project over an orchestra without the aid of a microphone. An opera singer would therefore only be able to include the notes that they are able to adequately project over an orchestra within his or her vocal range. In contrast, a pop artist could include notes that could be heard with the aid of a microphone.

Another factor to consider is the use of different forms of vocal production. The human voice is capable of producing sounds using different physiological processes within the larynx. These different forms of voice production are known as vocal registers. While the exact number and definition of vocal registers is a controversial topic within the field of singing, the sciences identify only four registers: the whistle register, the falsetto register, the modal register, and the vocal fry register. Typically, only the usable range of the modal register, the register used in normal speech and most singing, is used when determining vocal range. However, there are some instances where other vocal registers are included.\[^{[1]}\] For example, within opera, countertenors utilize falsetto often and coloratura sopranos utilize the whistle register frequently. These voice types would therefore include the notes from these other registers within their vocal range. Another example would be a male doo-wop singer who might quite regularly deploy his falsetto pitches in performance and thus include them in determining his range. However, in most cases only the usable pitches within the modal register are included when determining a singer's vocal range.\[^{[2]}\]

Vocal range and voice classification

Vocal range plays such an important role in classifying singing voices into voice types that sometimes the two terms are confused with one another. A voice type is a particular kind of human singing voice perceived as having certain identifying qualities or characteristics; vocal range being only one of those characteristics. Other factors are vocal weight, vocal tessitura, vocal timbre, vocal transition points, physical characteristics, speech level, scientific testing, and vocal registration. All of these factors combined are used to categorize a singer's voice into a particular kind of singing voice or voice type.\[^{[3]}\]

There are a plethora of different voice types used by vocal pedagogists today in a variety of voice classification systems. Most of these types, however, are sub-types that fall under seven different major voice categories that are for the most part acknowledged across all of the major voice classification systems. Women are typically divided into three groups: soprano, mezzo-soprano, and contralto. Men are usually divided into four groups: countertenor, tenor, baritone, and bass. When considering the pre-pubescent voices of children an eighth term, treble, can be applied. Within each of these major categories there are several sub-categories that identify specific vocal qualities like coloratura facility and vocal weight to differentiate between voices.\[^{[1]}\]

Vocal range itself can not determine a singer's voice type. While each voice type does have a general vocal range associated with it, human singing voices may possess vocal ranges that encompass more than one voice type or are
in between the typical ranges of two voice types. Therefore, voice teachers only use vocal range as one factor in classifying a singer's voice. More important than range in voice classification is tessitura, or where the voice is most comfortable singing, and vocal timbre, or the characteristic sound of the singing voice. For example, a female singer may have a vocal range that encompasses the high notes of a mezzo-soprano and the low notes of a soprano. A voice teacher would therefore look to see whether or not the singer were more comfortable singing up higher or singing lower. If the singer were more comfortable singing higher, then the teacher would probably classify her as a soprano and if the singer were more comfortable singing lower, then they would probably classify her as a mezzo-soprano. The teacher would also listen to the sound of the voice. Sopranos tend to have a lighter and less rich vocal sound than a mezzo-soprano. A voice teacher, however, would never classify a singer in more than one voice type, regardless of the size of their vocal range.

The following are the general vocal ranges associated with each voice type using scientific pitch notation where middle C=C4. Some singers within these voice types may be able to sing somewhat higher or lower:

- **Soprano**: C4 – C6
- **Mezzo-soprano**: A3 – A5
- **Contralto**: F3 – F5
- **Tenor**: C3 – C5
- **Baritone**: F2 – F4
- **Bass**: E2 – E4

In terms of frequency, human voices are roughly in the range of 80 Hz to 1100 Hz (that is, E2 to C6) for normal male and female voices together.

**World records and extremes of vocal range**

The following facts about female and male ranges are known:

- **Guinness lists the highest demanded note in the classical repertoire as G6 in 'Popoli di Tessaglia,'** a concert aria by W. A. Mozart, composed for Aloysia Weber. Though pitch standards were not fixed in the eighteenth century, this rare note is also heard in the opera *Esclarmonde* by Jules Massenet. The highest note commonly called for is F6, famously heard in the Queen of the Night's two arias "Der Hölle Rache kocht in meinem Herzen" and "O zitter nicht, mein lieber Sohn" in Mozart's opera *Die Zauberflöte*.

Several little-known works call for pitches higher than G6. For example, the soprano Mado Robin, who was known for her exceptionally high voice, sang a number of compositions created especially to exploit her highest notes, reaching C7.

- **Lowest note in a solo:** Guinness lists the lowest demanded note in the classical repertoire as D2 (almost two octaves below Middle C) in Osmín's second aria in Mozart's *Die Entführung aus dem Serail*. Although Osmín's note is the lowest 'demanded' in the operatic repertoire, lower notes are frequently heard, both written and unwritten, and it is traditional for basses to interpolate a low C2 in the duet "Ich gehe doch rathe ich dir" in the same opera. Leonard Bernstein composed an optional B1 (a minor third below D2) in a bass aria in the opera house version of *Candide*. In a Russian piece combining solo and choral singing, Pavel Chesnokov directs the bass soloist in "Do not deny me in my old age" to descend even lower, to G1, depending on the arrangement.

- **Lowest note for a choir:** Mahler's Eighth Symphony (bar 1457 in the "Chorus mysticus") and Rachmaninoff's *Vespers* require B♭1. In Russian choirs the oktavists traditionally sing an octave below the bass part, down to G1.
References


External links

- A history of vocal definition (http://www.medieval.org/emfaq/misc/voices.html)
- Accurate average vocal ranges (http://www.library.yale.edu/cataloging/music/vocalrg.htm)
- Singing Voice (http://www.singingvoice.net)
- National Center for Voice and Speech's official website (http://www.ncvs.org/)
- The Voice Foundation's official website (http://www.voicefoundation.org/)
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