

# **Vibrato in singers**

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Vibrato can be a subject for disagreement, disapproval and dissent. There are heated debates about vibrato in choral singing; personal taste and subjective judgments seem to be more evident in this area than most others related to vocal production. Perhaps we need to look initially at why vibrato occurs in voices, and why our instinct may find it unattractive in some cases.

### **What is vibrato?**

Vibrato is a natural phenomenon giving simultaneous fluctuations of pitch, loudness and timbre. It is related to tremor, which can be seen more clearly in the hands or legs under certain conditions. This vocal tremor will occur when pairs of muscles, acting in opposite directions, are working at the same time, but with a minimum level of effort. As soon as the balance between the muscle pairs is shifted, or if the effort level is increased, the tremor will cease, unless the individual has a recognized neurological condition.

The contraction of a muscle is triggered by a message from the nerve. As this has to travel from the brain, there is a slight time delay for this message to reach the muscle. When two antagonistic muscles contract simultaneously at a particular effort level, the message to one muscle (A) will result in a slightly stronger contraction while the message to the other muscle (B) is still travelling. When the message reaches muscle B, it will contract slightly more strongly than muscle A. This periodic shifting of balance between the two, results in a type of tremor movement with about 5 to 8 cycles per second. In the larynx, the lengtheners (cricothyroid) and shorteners (thyroarytenoid) work antagonistically and can produce a fluctuating fundamental frequency (pitch). This will vary from between a quarter of a semitone either way, to as much as a tone either way. In the breathing mechanism, the muscles of inspiration (diaphragm) and expiration (abdominal wall) will do likewise, resulting in fluctuation of intensity (loudness). The fluctuation in timbre, or voice quality, will be as a result of these two variations in the vocal production. Both giggling and rapid coloratura singing use this natural fluctuation in muscular engagement to achieve their effect.

### **Why does it occur?**

All sung sounds have vibrato. Periodic variations are a fact of the way in which these muscles work. A lot of the time our ears don't pick this up as they are used to smoothing out these variations. Our eyes do the same: as we look at an object, our eyes flicker from side to side in order to determine the outline of the item in view. This movement is imperceptible, both to us and to the observer, unless the individual suffers from a tracking problem like nystagmus. This outlining behavior is a possible

factor in how we listen to and determine the pitch of a sound. We can also sense whether a sung note has been altered in the recording studio; a sound that is too straight will appear unnatural to our ears. In fact, synthesized vocal sounds all have a vibrato added in order to make them sound more human.

### **Why does it vary so much between singers?**

The speed and range of vibrato will depend on many factors. A relatively large larynx with more bulky vocal folds will tend to generate a slower, wider vibrato. An older singer will have fewer nerve endings in the muscles of the larynx and will therefore have a slower response time, leading to a wider, slower vibrato. A wide vibrato can make it more difficult for the listener to locate the pitch of the note. An inappropriate vibrato may sound like a nervous bleat (too rapid) or an uncontrolled wobble (too slow and wide). If the vibrato effect is consciously created it will never sound as true as the natural or intrinsic vibrato. A vibrato at the optimum degree of fluctuation can be a symptom of well-balanced laryngeal function. Well-balanced function is the crucial point here. If the coordination between the air flow, larynx and articulators are enabling maximum output for minimum effort, it is most likely that the vibrato will also be at its optimum.

### **Why is it so evident in operatically trained singers?**

The training for the western classical singing style has, over the centuries, had to produce singers who can project their voice over a large orchestra, fill a large auditorium and sing for an extended time. This requires a very sophisticated balance of the whole vocal system in order to optimize loudness and resonance. The presence of vibrato is inevitable: the balance of muscular activity is finely adjusted to enable this projected sound. The periodic fluctuation is also essential in order to give some relief to the muscular contraction, thus prolonging vocal stamina. In a nutshell, the bigger the voice, the bigger the vibrato. If you like listening to 19<sup>th</sup> century opera, the only singers who are able to perform this repertoire will have a noticeable vibrato.

### **Is vibrato in commercial music singing different?**

The vocal technique for amplified singing is very different from western classical singing. The voice is used in a more speech-like setting and extended vocalized sounds are fewer. Singers will sometimes use less pitch vibrato and more intensity vibrato. They may also control and release the vibrato during a longer note.

### **Why don't children sing with vibrato?**

In young voices, however well-balanced the laryngeal activity, a vibrato is rare. I have only heard what I would call an intrinsic vibrato in children who are not only technically adept but also approaching puberty. In children younger than this I would suggest that any vibrato is a consciously imposed wobble. In voices post-puberty, my

experience is that the absence of a vibrato suggests a stiffening of the vocal folds, possibly as a response to the singer pushing too much air through the larynx, especially noticeable in girls. An intrinsic vibrato of some degree will always emerge as a by-product of more sophisticated technique. I have a hypothesis that the absence of vibrato in the child voice is due to the immaturity of the vocal ligament. Perhaps the presence of the vocal ligament provides enough body in the vocal fold to enable the vocalis muscle to release sufficiently for the antagonistic balance between it and the cricothyroid muscle to reach the optimum state for vibrato to occur. If that is the case, perhaps those highly trained adult singers with a naturally tiny or imperceptible vibrato in fact have a naturally slim vocal ligament.

### **Is it safe to remove vibrato, for example, to help blend in ensemble singing?**

This is a real hot potato! The answer is, that it depends on the singer and on the circumstances. In less projected singing, such as music that was written to be performed in domestic settings, or in amplified singing, it is less problematic for the singer to reduce vibrato. In renaissance and baroque music a straighter tone is often required. There is much unresolved debate on this topic, not helped by the irritating lack of original audio recordings from the period. As vibrato is a natural artifact of vocal production in the mature adult voice, it is likely that it would have been used to some degree. However, it tends to be most evident in voices that have developed a technique to project the voice in large spaces, over full orchestras. This is not so much of a requirement in music of earlier styles. The singers with smaller voices, most suited to early music styles, have a vibrato that is audible but very subtle. In larger settings such as churches or cathedrals, the soprano line of the music was often written to be performed by children. Children can project their singing voices without vibrato, but their voices do fatigue more quickly than adults. Requiring adult females to sound like children is often fraught with technical problems as well as raising possible questions concerning the desires of the musical directors.

Finally, we know that vocal vibrato is naturally occurring and that instrumental vibrato is an aesthetic choice. Can we assume that all instrumental vibrato is in fact just a copy of what happens naturally in the voice?

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