

# On the Three Elements Affecting the Color of Singing Voice

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**Abstract:** Singing voice color is a singing concept that is very easy to be ignored for vocal music students. Especially in the initial training process of single vocal music technology, students often don't care much about their singing color on the way of exploring higher range expansion and higher volume pursuit. They don't think much about whether they can optimize their own voice color, and they need to rely more on the objective evaluation of teachers and audiences. At home and abroad, the research on the color of singing voice is still in the conceptual state. Through practice, research, interview, literature review and other methods, this paper further summarizes the three elements that affect the color of singing voice. Due to the diversity, complexity, variability and randomness of the color of singing voice, there is still a long way to go in the future.

**Keywords:** Sound color; Physiological conditions; Singing technique; Singing psychology

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## Text

When it comes to the word color, we will feel its existence in all aspects of our life. Especially in the field of fine arts, there are not only many descriptions and studies on colors in Chinese and foreign literature, but also in recent years, with the wave of cultural renaissance in China, artists and workers of relevant art majors have sorted out the color spectrum representing traditional Chinese colors, making contemporary Chinese realize that the original beautiful colors are not only the Morandi color system.

Compared with the "visible and tangible" colors in the field of art, the colors in the field of singing are very secretive and unpredictable. Vocal music educators or singers have a very sensitive interpretation of color. What is interesting is that there are thousands of people and thousands of faces. The beauty of the color presented by the voice is that it is unpredictable, casual and unrepeatable. As the saying goes, there are no two identical leaves in the world. Different physiological structures, singing techniques and singing psychology will create countless and vastly different voice colors. If matched with different styles, different periods and different composers, the vast number of vocal music works, the color of singing voice will present a dazzling array of states in the mouth of many singers. Based on the complexity of the operation of singing organs, the particularity of singing instruments and the uncontrollability of singing psychology and other reasons, coupled with the restriction and restriction of the current development of science and technology, it is difficult for us to simply formulate a clear standard for the color of human singing voice as the traditional Chinese color spectrum, however, we can combine the research on the timbre part of the Chinese and foreign parts division system to simply summarize and sort out the three elements that can affect the color of the singing voice.

In the modulation of different color technology, since ancient times, the West has a very strict color technology and standards. Similarly, in the field of singing, there are also very strict technical requirements for the generation and adjustment of timbre. Next, we mainly focus on three aspects in detail:

### 1. Physiological conditions

We often see that the singers on the stage have different body types. For example, some singers are very tall, or their facial bones are round, or their facial bones are vertical and rectangular, or their necks are thick and short, or their heads and bodies are large,

or their chest is very strong. Some people have small oral space and opening and closing strength, and some people have low vital capacity, some actors have large curvature of the hard palate part of the upper flap, some singers' palatopharyngeal arches are acute triangular, while others are obtuse triangular or semicircular, some have small width and volume ratio of the posterior pharyngeal wall, some singers have strong abdominal muscles, and some have weak diaphragm extension. There is also a special case, that is, before and after giving birth, female singers will also have obvious changes in the color of their singing voice due to changes in the diaphragm force caused by the great changes of hormones in a short period of time and the displacement of chest, abdomen and pelvic organs.

For example, the difference between the dramatic tenor and the large lyrical baritone is often due to the different vocal conditions of the singers, which leads to the difference of the final timbre. The vocal cords of the dramatic tenor are thick and short, which not only have the metal color tension of the tenor, but also can interpret the glory and power of the baritone part. In general, regardless of the height of soprano and tenor, the distance from the head to the shoulder via the neck is usually shorter, and the proportion of head to body is lower. The voice parts with round head structure and body structure are mostly lyric or large voice parts, while the voice parts with vertical square head structure and body structure are mostly large or even dramatic voice parts, but statements such as "short people pull out high pitches" or "high parts tend to be low in height" are unscientific.

In addition, there are also some people whose singing organs do not match the growth, such as the vocal cords of baritone and the cavity of tenor at the same time. For example, due to the failure to successfully complete the growth transition of timbre during the voice change period, the timbre of boys is feminine or there is a strong male quality in women's voices, which will also affect the color of singing voices. In addition, it is worth mentioning that, in addition to adolescence, pregnancy and other conditions subject to the influence of physiological hormones, some body lesions can also lead to great changes in the color of singing voice, such as palatoglossal arch cancer, throat cancer and so on.

## **2. Singing technique**

All the students who have been trained in scientific and systematic vocal music know that the process of learning how to sing scientifically is how to deal with the balance between motivation, vibration source and resonance. The vast majority of students will be in the long vocal music learning process day after day to practice the diaphragm as the core of the respiratory muscle group, the vocal cord as the core of the source of muscle group and the mouth, pharynx, throat, nose, sinus, etc. as the core of the resonance cavity muscle group.

The vocal cord is the main structure of human vocal, it is located in the larynx, composed of different cartilage, including cricoid cartilage, thyroid cartilage, epiglottic cartilage and arytenoid cartilage. When the lungs exhale air, the air flow through the narrow glottis to generate subglottic air pressure, in the case of the assistance of intrathoracic pressure, driven by multiple groups of muscles in the larynx, the vocal cord mucosa will produce waves like waves closed to the center, this fluctuation makes the air medium near the vocal cords vibrate, thus forming a dense wave, also known as sound waves. These sound waves are rich in harmonics, and the strength and pattern of the harmonics determine the different colors of the sound. At the same time, the resonance cavity also has an important influence on the color of the sound. The sound is amplified in the cavity such as mouth, pharynx, nose, throat and sinus. At the same time, with the participation of lips, teeth, tongue and other organs, due to the hardness of soft tissues and muscles, the width and length of bones, the height of the hard palate and the angle of the dome, various timbre are produced, in addition, the chest also plays a decisive role in changing the tone. It can absorb the noise in the sound and enhance the thickness of the sound color. Therefore, along with the increasingly sophisticated vocal singing technology, the singer's voice color will be at any time sound quality changes.

## **3. Singing psychology**

Singing psychology and stage performance psychology are compulsory courses for every vocal music worker. Many famous singers at home and abroad agree that singing is a profession with a very high risk factor. Every live singing is like a high-altitude tightrope for actors. Its live, unique and effective performance not only requires actors to have very High-level and flexible

singing skills and outstanding stage performance style, but also strong psychological quality and pressure resistance. Performance accidents caused by symptoms such as stage tension and anxiety abound. When actors finally stand on the stage, the color of their singing voices is greatly reduced. Even for experienced singers and old artists, the pressure on their hearts is even more different from that of ordinary people. Human body function out of the principle of self-protection, in the case of the brain feel danger and tension, voluntary muscle and smooth muscle due to contraction and lead to too tight or even spasm, thus greatly affecting the singing voice color and texture.

In addition, the singer's personal aesthetic, cultivation and preferences, will also have a greater impact on the singing color. For example, in the same work, an actor with a strong personality will sing the work forcefully, while a singer with a soft heart will handle the work softly. In addition, if the same actor sings at different ages and different moods, the color of the singing voice will also change. For example, the treatment of the same work will show completely different color of the voice when it is young and old, when it is happy and when it is sad.

## **Conclusion**

Singing art workers want to better control the stability and particularity of their own voice color, it is necessary to strengthen the training of singing skills while ensuring physical health, and actively establish an open-minded life pattern and a stable psychological quality. Mastering these three elements plays a very important role in learning how to control the color of singing voice.

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