The Application Analysis of the French Horn in Chinese Symphony Based on Fusion Features by Computer Aided Technique

Bin Lv*
Xi’an Conservatory of Music, China, 710061

*Corresponding author e-mail: Binlv@163.com

Abstract. With the further deepening of reform and opening up, China has gradually begun to study the horn. The horn, with its unique charm, integrates woodwind instruments with brass instruments and becomes a complete art. In this paper, the application of the French horn based on fusion features in Chinese symphonies is analyzed by computer aided technique. It further shows that the French horn plays an important role in Chinese symphonies.

Keywords: Horn, Fusion Feature, Chinese Symphony, computer aided technique

1. Introduction
In every symphony orchestra, there is no way to get rid of the application of the horn. It further shows that the horn plays an important role in Chinese symphony[1]. The horn can be used as a solo instrument or as an ensemble instrument[2]. It has become one of the indispensable instruments in the symphony orchestra due to its unique duality[3]. The main core of symphonic performance is the integration of the whole, which is a whole art formed through the cooperation of various instruments. And the horn can play a better role in symphony fusion and cohesion.

1.1. Introduction of horn
The horn originated in ancient Greece and Roman. People use the animals’ horns to make horn to convey message to each other. Then, it gradually becomes an instrument. In 1705, the horn, as an instrument, officially entered into the music[4]. After that, the horn began to develop in the band. The horn has been in China for a hundred years. Since 1980, there have been many studies on the horn in Chinese music theory circle. The findings are as follows:

| Technical theory of horn playing | Study on the playing art of horn | Research on the teaching of horn playing | Other relevant studies | A study of brass instruments |
|----------------------------------|---------------------------------|----------------------------------------|-----------------------|-------------------------------|
| 23 articles                      | 25 articles                     | 12 articles                             | 11 articles           | 31 articles                   |

Table 1. The Results of the Survey on the Filed of Music Theory

It is of great significance to systematically sort out these theoretical achievements to promote the development of Chinese horn art.
During the playing of horn, there are three common playing postures, which are sitting, upright, standing and sit-standing. The following shows three playing methods and application of the horn.

**Table 2. Horn Playing Method and Applicable**

| Playing methods of the horn | Sitting upright | Standing | Sit-standing |
|-----------------------------|-----------------|----------|--------------|
| Applicable                  | During rehearsal and practice | Performing independently or during an honor guard performance | In the course of chamber or a symphony |

The horn has brass and woodwind timbre. The tone of the brass is full, giving a feeling of excitement but the tone of woodwind is soft and for-reaching, giving a feeling of holy and elegant.

### 1.2. The fusion characteristics of the horn

The middle part of the horn is very expressive\(^2\). For example, in the symphony "the taking of tiger mountain by wisdom", people are brought into the forest through the playing of horn\(^3\). It gives people the feeling of being in the scene, as if the lingering sound is still reverberating in the valley. In a symphony orchestra, the horn combines woodwind instruments and brass instruments with its unique charm, making it an integral art. Horn has a variety of performance skills, with blocking or blocking methods will show different artistic colors. For example, it makes the horn sound louder and clearer by blocking, which makes people think a lot about other instruments in the symphony. When using obdurate blowing way, it can make the horn with a strong vibration. And the atmosphere of tension and terror set off incisively and vividly (Cheng Hao, 2015, 102).

### 1.3. Unique timbre

The horn has an elongated horn. When the air change is rapid, the air column is more difficult to change in time. It is for this reason that the horn is characterized by slow pronunciation. Meanwhile, there are higher technical requirements for the player, which need to control the strength and air pressure to form the desired effect. The timbre of the horn is rich and diverse, which can not only show the fresh and natural, but also can show indifference and terror. Such a strong expression must be accompanied by superb performance skills. The timbre of the horn is used in different ways in different symphonies. For example, classical music tends to be more expressive, and the timbre should be kept moderate and the pronunciation natural and harmonious. Therefore, the horn is an indispensable instrument in a symphony orchestra, which can not only promote the atmosphere, but also improve the overall performance.

### 2. The Application of the Fusion Characteristics in Chinese Symphony

#### 2.1. Increase the connection between different types of instruments

Because the horn belongs to the brass instrument, it is endowed with the characteristic that the tone can be changed arbitrarily between different degrees of softness and hardness. When the sound of the symphony orchestra is high, the horn can make the whole symphony more expressive through the accurate use of its timbre to constantly impel people’ shearing and give people a relaxed and happy mood. In the low voice of the symphony orchestra, the horn shows a soft and sad mood through the control of the low voice, which leads people into a sad situation. Orchestras sometimes are high and sometimes are low, and its need a good transition in order to connect well. It is through the control of its flexible timbre and tone that the horn realizes the mutual conversion between different types of instruments, so that the prominent instruments will not give a harsh feeling when playing.

In Spanish rhapsody, for example, the horn plays an important role in the transition from strings to brass, without giving the impression of stiffness. The horn produces different sounds by controlling the part of the voice. At the same time, different dynamics also directly affect the expressive force. Different dynamics are used to represent different situations and connect different pictures. For example, “fff” or “f” is usually used to perform magnificent and majestic images, while “f” or “mf” is used to perform lively and free situations. In many symphonies, the horn usually plays a role in
connecting the instrument with the excess (Liu Gen, 2013).

2.2. Make it easier for all kinds of instruments to fuse

The horn has a rich tone and is broader than other instruments. Its high pitch is sharp and harsh, but its low pitch is soft and dull. The middle tone area of the horn is the most commonly used, which is beautiful and natural. It can shape extremely powerful and can be a perfect expression of a variety of emotions. To enhance the effect of the playing, a symphony orchestra usually has two or four horns so that the soprano and bass parts are respectively manned. The horn can be said that the widest vocal range of the instruments at of all brass. It has a range of two octaves, which invisibly increased the flexibility of horn playing. It not only can switch between the high voice and the low voice according to the needs of the band but also can change the method of playing so as to change its sound loud. For example in the Pastoral, the combination of horn and the piano, which gives a person to bring decorous feelings.

![Figure 1. Compose Music 3 A Part of the Score of A Pastoral](image1)

In the process of symphony orchestra performance, there are many cases that some kind of instrument is needed to play as an independent voice part. The horn, on the other hand, is mostly used as a soloist and can be used as a rhythm instrument. In a band, whether the horn is intonation, is not evaluated independently of other instruments, but by the intonation of the whole voice, which often depends on the degree of coordination between various instruments. If the horn wants to make all kinds of instruments blend with each other, it must adjust its timbre and strength timely according to the needs, so as to improve the overall effect of the band (The Yellow Sound, 2014). For example the horn of solo City of Sky , it contains a tenor quartet.

![Figure 2. Compose Music 4 solo City of Sky](image2)

From that compose music, it can obviously show that the horn has a heavy sound. To some extent, it shows the slow pronunciation of the horn. Meanwhile, only by combining the trio, it can be played perfectly.
3. Conclusion
Horn is from the rough pronunciation to the development of elegant control instruments through all kinds of difficult development process. With the extensive use of horn in symphony orchestra, horn plays an incomparable role in symphony orchestra by virtue of its unique timbre and flexible conversion of various parts. In the process of playing the horn, using a variety of playing methods and effective control of the sound range, the horn can perfectly express different situations and emotions. It enriches the expressive force of the symphony orchestra and makes the symphony more attractive and exciting. The research and application of horn fusion characteristics make Chinese symphony orchestra develop in a more stable and deeper direction.

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