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## Application of comprehensive evaluation method in the performance process of professional instruments

Rui Guo

Arts Department, Handan College, Handan, 056005, (CHINA)

### ABSTRACT

This paper analyses performance process of professional instruments with the comprehensive evaluation method and use some evaluation criteria of comprehensive evaluation method to solve a variety of problems in the performance of professional instruments. In the ancient times, the performance of professional instruments was very popular in the music scene and it brought great joy to people. After the joint efforts of people who love music, the performance of instruments gets a long-term development. The beautiful timbre and rich expressiveness of instruments make many people indulge in it. But, usually, there are a variety of problems in the performance of professional instruments. Comprehensive evaluation is a necessary method to realize the fluency of professional instruments performance. Using this evaluation method can solve the various problems during performance effectively and it provides a theoretical basis for the performance of professional instruments. It not only requires the related performers to enhance the performance technology, but also puts forward some worthy suggestions for the overall stage psychological situation of the performers. The study of this paper provides a theoretical basis for the performance of professional instruments.

### KEYWORDS

Comprehensive evaluation method; Performance of professional instruments; Timbre.



INTRODUCTION

In the ancient times, the performance of professional instruments was very popular in the music scene and it brought great joy to people. After the joint efforts of people who love music, the performance of instruments gets a long-term development. Many performances of instruments are very popular with people. Moreover, a lot of artists use these instruments play out many famous songs. Its loud and sonorous voice exists in the hearts of the audience forever.

With the improvement of people's living standards, everyone's musical literacy has increased and many people like different musical instruments. The beautiful timbre and rich expressiveness of instruments make many people indulge in it. But, usually, there are a variety of problems in the performance of professional instruments. For example, the viola, because it is big and heavy, so it may has problem in the performance process.

In fact, many experts and scholars have studied the problems occurred in the performance process of professional instruments. This study also makes reference to the results of previous studies. Some of the points raised by them are meaningful absolutely. For example, Tang Wei analyzes the problem of intonation in the performance of violin and other problems. Also, she puts forward many solutions which are worth reference, such as more scale exercises<sup>[1]</sup>. Professor Li Zhenggen has been proposed some ways to overcome the performer's emotional state of tension and anxiety on stage. In reality, indeed, there are a lot of performers have the sense of fear and tension on the stage leading to performance failure<sup>[2]</sup>. In an article of Violin Technology, Professor Liu Hong describes the various issues on violin in detail, and also gives detailed solutions for the issues<sup>[3]</sup>. Wei jikang analyses the mistakes of many performers in the performance of professional instruments, such as the problem of intonation and other problems<sup>[4]</sup>. On the basis of previous studies, this paper analyzes the application of comprehensive evaluation method in the performance process of professional instruments hoping to provide the appropriate theoretical basis for our performance of professional instruments through this study.

SUMMARY OF THE COMPREHENSIVE EVALUATION METHOD

In fact, the comprehensive evaluation method is widely used in people's life. We may not know the name of this method, but there are indeed a lot of things that are using this standard to quantify. For example, in a variety of practical operation, we can make post-evaluation to the project of instruments performance by using the comprehensive evaluation method. Because this method needs to use multiple indexes, so the evaluation methods to project can be decomposed into the evaluation in the process of project construction, the evaluation in the process of project economic benefits, the evaluation to the social and economic influence of project, the evaluation of sustainability and the evaluation to decisive factor. We can choose different evaluation methods according to their different characteristics. Of course, this standard is not uniform, because the aesthetic of each audience is different, so it is normal to have some differences.

So, in implementation process of the entire project, we assume that the evaluation to all aspects of the professional instruments performance is P1; the evaluation to all kinds of benefits of the entire performance project is P2; the evaluation to all kinds of influence of the entire performance project is P3; the evaluation to sustainability of the entire performance project is P4; the weight they shared respectively is  $\mu_1 - \mu_4$ . Then the computational method of the overall score of project's post evaluation P is:

Positive index  $X' = \frac{X - X_{min}}{X_{max} - X_{min}}$  LLLLLL  $X_{min} \leq X \leq X_{max}$

Negative index  $X' = \frac{X_{max} - X}{X_{max} - X_{min}}$  LLLLLL  $X_{min} \leq X \leq X_{max}$

moderate index  $X' = \begin{cases} 1 & \text{LLLLLLLLLLLLL } X = X \& \\ \frac{|X - X \&|}{\max(X_{max} - X \&, X \& - X_{min})} & \text{LLX } \neq X \& \\ 0 & \text{LLLLLLLLLLLLL } X \leq X_{min} \text{ or } X \geq X_{max} \end{cases}$

Among them,  $\mu_1 - \mu_4$  is the shares of the weight. The numerical values can be obtained by collecting views of experts and referring to some other people's opinions. Of course, this standard is not uniform, because the aesthetic of each audience is different, so it is normal to have some differences. However, the four evaluation contents in the one-level evaluation object are very important to the overall evaluation results. So we should pay much attention to them and quantify them, and use the analytic hierarchy process (AHP) to calculate them.

Because  $X_1 - X_4$  are the evaluation results of the decisive factors of the whole performance project and the decisive factors adopt the evaluation of 0/1, so this index has veto power and it has the biggest impact on the final results. Therefore, we need to be particularly careful in evaluation.

As above, the method which evaluates many participating units by using several indexes at the same time is called multivariate comprehensive evaluation method, or is short for comprehensive evaluation methods. As we all know, its basic idea is to transform multiple indexes into an index reflected the comprehensive situation to evaluate such as the following TABLE 1.

**TABLE 1 : Comprehensive evaluation index**

One point	No activity can be evaluated
Two points	There is no difference compared with other activities
Three points	The activity is good, but not particularly outstanding
Four points	The activity is good and it has become part of the core technology
Five points	The activity is very good, can become a benchmark model

**Definition of comprehensive evaluation method**

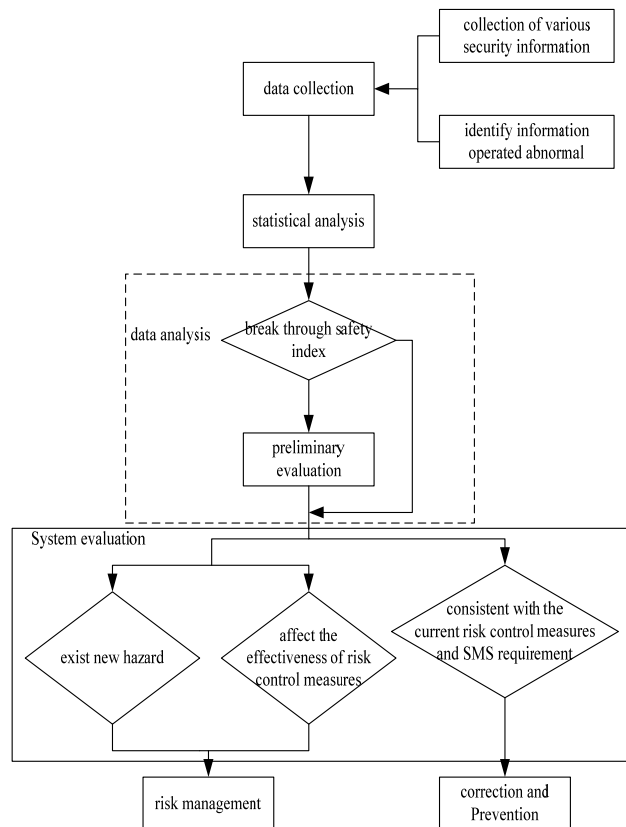
The method which evaluates many participating units by using several indexes at the same time is called multivariate comprehensive evaluation method, or is short for comprehensive evaluation methods. As we all know, its basic idea is to transform multiple indexes into an index reflected the comprehensive situation to evaluate.

So the characteristics of comprehensive evaluation method are:

(1) In the evaluation process, it does not complete each index sequentially. The order of different indexes may be arranged according to the importance. But, in the actual evaluation process, it finishes the evaluation of several indexes at the same time by some special methods. Maybe, it is arranged according to the order of time. This will produce some subtle differences with the rank according to the importance of the index mentioned above. For example, in the process of instruments performance, the evaluation to the entire result is not completed at one time, or perhaps it is not completed in accordance with the order on the table which is arranged in advance shown as TABLE 2.

**TABLE 2 : The order on the table which is arranged in advance**

order	social evaluation index (quantitative and qualitative indexes)	analysis of evaluation results	brief description (include measure, compensation and cost)
1			
2			
3			
4			
...	.....	.....	.....
	summary and evaluation		



**Figure 1 : The flow chart of comprehensive evaluation process**

(2) Here, you need to pay attention to is that we should weight according to the importance of indexes in the process of comprehensive evaluation. Some key work is the things that directly affect the progress of the project, such as the performers. But, if the work which has problem first is a key work, then whether the evaluation index is ranked in the front or rear, it will certainly have more or less influence on the subsequent work. Then you must take the appropriate adjustment measures to ensure the normal operation of the project. If the work which has deviation is not the key work, we need to determine the influence on subsequent work and the total duration according to the relationship between the deviation value with total float and free float. The flow chart of comprehensive evaluation process is shown as Figure 1.

(3) In the comprehensive evaluation, the evaluation results are no longer the statistical indexes with specific meanings, but some ranks that express the comprehensive state of participating units with index or score. As the TABLE 3 below, such a method can be more convenient and direct to understand the specific situation of things. In contrast with other previous evaluation methods, this evaluation method can show statistics properties more intuitively. Appropriate people are more important to knowledge mining and intuitive information and this is a good way to make object attribute data "visualization" directly and visually. It can make the abstract problem specific.

**TABLE 3 : The ranks that express the comprehensive state of participating units**

Secondary index	Third class index	Better	Good	General	Bad	Worse
meet the demand of customer A12	meet the content of the demand A121	6	3	1	0	0
	meet the quality of the demand A122	2	4	4	0	0
	service location A131	3	4	3	0	0
pay attention to customer value A13	development of customer relationship A132	0	3	6	0	0
	image of reputation of enterprise A133	1	4	5	0	0
service performance before service A21	information ability A212	5	2	3	0	0

#### Steps of comprehensive evaluation method

Firstly, identify a series of comprehensive evaluation index system which is the foundation and basis of comprehensive evaluation. Only determining a series of comprehensive index, it can go on the operation of next step.

Then, make further data collection. Data sources can be very wide, and make further measure of the same treatment for the index data of different measurement units.

Then, gradually identify the weights of each index in the index system. So, many indexes can ensure the scientificity and universality of the evaluation.

Summarize the index after processing, and work out the comprehensive evaluation index or the comprehensive evaluation score.

Order the participating units according to the evaluation index or score and make a conclusion.

#### Comprehensive evaluation methods and types

Evaluation methods include principal component analysis, data envelopment analysis and fuzzy evaluation method.

(1) Principal component analysis. Maybe this sounds very complex, but it is the method to evaluate several participating units by using several indexes. Also, it is a random vector. It only use the help of orthogonal transformation, and is transformed into the new random vector which is not related to component. Of course, this is not the end, then it regards the variance as a measure of the amount of information, and thus carry out dimension reduction to the new random vector. Finally, by constructing an appropriate value function, it can make a further system conversion.

(2) Data envelopment analysis. Unlike other methods of analysis, this method can not only evaluate and rank the relative effectiveness of each decision unit of the same type, but also can make a further analysis to reasons for non DE efficient of each decision unit and improvement direction, thus providing important management decision information for the decision maker. Also, it may carry on the data analysis for different type of things, so as to make effective judgment.

(3) Fuzzy evaluation method. It can not only evaluate and rank the evaluation object according to the size of comprehensive score, but also assess the grade of object based on the value of fuzzy evaluation set and according to the maximum membership degree principle. It plays a very important role in evaluation.

### OVERVIEW OF PROFESSIONAL INSTRUMENTS PERFORMANCE

Now, for our fast-paced life, we can listen to the pure and sweet piano in the irritability of work. The beautiful melody may sweep the unease of work away. Especially in the sleepy afternoon, listening to quiet music, it is like a dancing butterfly rising and dancing in a happy mood in the air, also like A tinkling fountain flowing in the mountains. Sometimes, it is like bright stars flashing in the night sky. So, do you pay attention to the performance of professional instruments? With the improvement of people's living standards, everyone's musical literacy has increased and many people like different

musical instruments. The beautiful timbre and rich expressiveness of instruments make many people indulge in it. But, usually, there are a variety of problems in the performance of professional instruments.

### **The problems in the performance of professional instruments**

Compared with the Western musical instruments, playing Chinese traditional musical instruments are more difficult than others and the playing technique is more complex. In the modern society, many people are interested in playing professional musical instruments, but some people will meet some problems when playing them. Such as some people perform very well in the peacetime training, but once they make actual performance on the stage, owing to the eager to show themselves, they have relatively large pressure. When the pressure coming from the playing skills and performance aspects become too large, it will arise the “too nervous” phenomenon. For some people, the specific performance are: their physical body movements become incoordination; they may also arise the situation of breathing hard and having stress; some performers even pronounce difficult or impossible to make sound at the beginning of playing; performance motor function become less coordinated; the psychological burden is too heavy and so on. These performances make great influence on the performance of pipe instruments, and it is difficult to show their superb skills. Many people wonder why they appear this kind of phenomenon. The fundamental reasons for this phenomenon are their psychological condition defects. It means that their psychological quality is not good. In many cases in the real world, the relevant performers who playing a musical instrument in the performance process, whether in physical or psychological, are easy to form some obstacles. They are lack of excitement or over excitation when making performance and lead to playing disorders. And, compared with the usual practice, the relevant performers have higher expectation on the performance effect. This is also the root cause of the insufficient or excessive excitement.

Because of the existence of these problems, therefore, to study and grasp musical instruments has a very important significance for instrumentalists. In the art of instrument performance, the performers grasp their own psychological activities through holding the various conditions such as lighting and audience, so as to obtain better stage effect and let the audience get the visual and auditory feast. We believe that all of these are essential for any performers.

We all know that there is no problem if the muscles maintain continuous tense for a short period of time, but if the corresponding tension time beyond certain limit, then you will lose the corresponding normal regulatory function. This is very normal. However, in this situation, the body usually will have feeling of numbness, then it will arise a certain difficulty for playing, particularly easy to make incorrect syllable. Although in medicine, it is just a self protective means from the bottom of body and it is benefit for people, it make against the performance. Like all things, if you only consume power needlessly, then it will hinder the play of free. Correspondingly, only in the relaxed state, the performer could play a normal level and achieve good performance effects. That is to say, when each action or each posture is completed by the way of the most effort, most specific and most comfortable, the body in a relaxed state, that is a good using state. Good use of body means that the body should maintain the right balance, because only in equilibrium, all the senses will feel joyful. Similarly, only when the performer conveys a feeling which make people feel effortless, people will have the feeling of joy.

Moderation is the best for all things. In the actual situation, there are a lot of performers feel nervous and fear before they go to the stage, so as to lead to errors. So in this condition, the related energy of human body will be started up well, which make the body feel comfortable, and can be put into full use at any time, without any restrictions on consciousness. Therefore, in the performance process of instruments, it is necessary to allow the body to maintain an appropriate tension. But if the body appears excessive nervous, the energy which could be used in performance will lost, and the playing action will be sluggish; if too relaxed, the music which is expressed will lack vigor and color, or even the whole music will slump down. Therefore, there will certainly not appear the wonderful music like the butterfly rising and dancing in a happy mood in the air.

So you can say that, in the whole performance process of instruments, fundamentally, it is the control process of stage time, stage motivation and music emotion. If you can grasp the stage time and emotion well, you can drive the audience’s emotions effectively, so as to achieve a better resonance effect. In fact, the performance process of instruments is actually the process of performer’s psychological activity.

### **Solution to the problem in the performance of professional instrument**

For this situation, comprehensive evaluation method can evaluate project effectively. We can make post-evaluation for the project of instruments performance by using the comprehensive evaluation method. Because this method needs to use multiple indexes, so the evaluation methods to project can be decomposed into the evaluation in the process of project construction, the evaluation in the process of project economic benefits, the evaluation to the social and economic influence of project, the evaluation of sustainability and the evaluation to decisive factor. We can use different evaluation methods according to their different characteristics. Of course, this standard is not uniform, because the aesthetic of each audience is different, so it is normal to have some differences.

## **CONCLUSION**

This paper uses the comprehensive evaluation method to analyze problems appeared in the process of professional instruments performance. Of course, firstly, it introduces the related concepts of comprehensive evaluation method. The method which evaluates many participating units by using several indexes at the same time is called multivariate

comprehensive evaluation method, or is short for comprehensive evaluation methods. As we all know, its basic idea is to transform multiple indexes into an index reflected the comprehensive situation to evaluate. Then, it explains some evaluation standards of comprehensive evaluation method. Because this method needs to use multiple indexes, so the evaluation methods of project can be decomposed into the evaluation in the process of project construction, the evaluation in the process of project economic benefits, the evaluation to the social and economic influence of project, the evaluation of sustainability and the evaluation to decisive factor. We can choose different evaluation methods according to their different characteristics to solve the various problems appeared in the performance of professional instruments. Comprehensive evaluation is a necessary method to realize the fluency of professional instruments performance. Using this evaluation method can solve the various problems during performance effectively. And it provides a theoretical basis for the performance of professional instruments through the study of this paper. It not only requires the related performers to enhance the performance technology, but also puts forward some worthy suggestions for the overall stage psychological situation of the performers. The study of this paper provides a theoretical basis for the performance of professional instruments.

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