

Scientific Transformation and System Reconstruction of Occupational Health Guarantee System for Chinese Opera Actors

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Abstract: This article explores the scientific transformation and institutional restructuring of the occupational health protection system for Chinese opera performers. With the continuous injection of funds for modern theater construction and intangible cultural heritage protection, the occupational health issues of opera performers have become increasingly prominent, becoming a core contradiction that constrains artistic inheritance. The article first analyzes the conflict between traditional techniques and scientific ethics, pointing out the tendency towards physical instrumentalization in opera training and the institutionalization of high-risk actions. It then proposes solutions through technological empowerment and organizational change, including the application of intelligent equipment, the introduction of scientific knowledge, modernization of theater troupes, and enhanced public awareness. Finally, the article outlines practical paths for systematic restructuring, including building a three-tiered support system, continuously promoting the foundational reconstruction of scientific protection, and reconstructing value systems and industry standards. These measures aim to break the tragic narrative of "hard training leading to success," construct a protection system that respects the dignity of performers, and promote the sustained prosperity and development of opera art while inheriting excellent traditional Chinese culture. The article argues that the scientific transformation and institutional restructuring of the occupational health protection system for Chinese opera performers is an inevitable choice in the evolution of civilization.

Key words: Occupational Health of Chinese Opera Actors; Physical Training; Sports Injury; Technical Empowerment; Organizational Change

1. Introduction

Chinese opera is an important carrier of Chinese culture. As a treasure of intangible cultural heritage of Chinese civilization, it carries thousands of years of aesthetic genes. [1] However, against the backdrop of continuous funding for modern theater construction and intangible cultural heritage protection, the occupational health issues of opera performers have become increasingly prominent, becoming a core contradiction that constrains artistic inheritance. The phenomenon of opera actors retiring due to occupational injuries is quite severe. This not only reflects the hardships faced by opera actors on their career paths but also highlights the deep-seated challenges traditional arts face during modernization—how to protect cultural roots while establishing a system that respects the dignity of actors' lives. This article aims to conduct an in-depth analysis of the "scientific transformation" and "institutional restructuring" of the health protection system for opera actors, and proposes systematic solutions.

2. The Conflict Between Physical Training of Traditional Techniques and Scientific Ethics

Chinese opera is a highly integrated art form that combines singing and physical movements. Its core performance system is based on the four major techniques: "singing, reciting, acting, and martial arts." [2] Through subtle actions such as eye movements, gestures, body posture, and footwork, characters are vividly portrayed in specific

contexts.[3] In the process of inheriting opera art, traditional techniques hold a pivotal position. However, while these techniques emphasize technical excellence, they also reveal conflicts with scientific ethics, particularly the tendency towards the instrumentalization of the body in opera training. Opera performances use the actor's body as the medium for expression, and the display of artistic means relies on changes in the actor's bodily movements.[4] Yet, traditional training systems often view the actor's body merely as a vessel for technique, neglecting its integrity as an individual life. This tendency is especially evident in the basic training of opera, such as physical exercises and combat techniques, which require extensive physical training from actors. However, when this training overemphasizes the mechanical and technical aspects of the body, it can lead to the instrumentalization of the actor's body, with their inner emotional experiences and vitality being overlooked. This can not only lead to physical injuries, but also have a serious impact on their mental health. For example, the excessive use of "ruler teaching methods" in traditional instruction can result in psychological trauma for students.

In addition, physical training is crucial for the professional development of opera performers. Among various performance movements in traditional Chinese opera, there are some that are highly challenging and dangerous, as their execution often provides audiences with many thrilling experiences. However, when practicing these high-risk moves, it is easy to encounter institutional issues. This also becomes another significant manifestation of the conflict between traditional techniques and scientific ethics. Many opera performances include highly challenging movement, such as the "Diao Mao" in Peking Opera and the "Wo Yu" in Kunqu Opera. When performing these movements, opera actors often have to bear great physical loads, which even exceed the physiological limits of the human body.[5][6] However, due to the influence of traditional concepts in the opera industry, these high-risk movements are often regarded as important criteria for measuring an actor's skill level.[7] Scientific ethics require that while pursuing artistic expression, the safety of actors must be fully considered. However, during training,

these ethical requirements are often overlooked. For example, when performing the "Diao Mao" movement and landing, the impact on the cervical spine far exceeds their own weight; when executing the "Wo Yu" movement, the lumbar spine bears enormous physiological loads, potentially exceeding safe thresholds. These high-risk movements not only severely threaten the health of actors but also constrain the sustainable development of opera art.

According to the above analysis, Chinese opera, as a unique art form, has added boundless charm to performance through its system of "singing, reciting, acting, and martial arts." However, during the process of inheritance, it has also exposed issues such as the tendency towards physical instrumentalization and the threat posed by high-risk actions to actors' health, which conflict with scientific ethics. We must face these problems head-on, fully valuing and protecting the physical safety and health of actors while pursuing artistic effects, to promote the sustainable development of opera art.

3. Technology Empowerment: The Underlying Reconstruction of Scientific Guarantee

In the face of the conflict between traditional training and scientific ethics, technology empowerment has become an important means to reconstruct the underlying scientific guarantee.

In recent years, artificial intelligence technology has developed rapidly. AI equipment and technologies can be introduced and applied in opera performances to provide actors with more comprehensive safety protection. For example, smart knee guards equipped with built-in pressure sensors and micro-hydraulic devices can be used for "Gui Bu" movements in Peking Opera, dynamically adjusting support force to reduce the impact on the knee joints. The application of such intelligent equipment not only enhances safety during performances but also provides more precise guidance for training. At the same time, smart wearable devices like intelligent nutrition bracelets can monitor actors' heart rate, blood pressure, electrolyte loss, and other physiological indicators in real-time, promptly identifying and preventing potential health

risks.

Technology empowerment can also enhance the scientific level of opera training. By introducing knowledge from sports anatomy, biomechanics, and exercise physiology, more scientific planning and guidance can be provided for opera performers' training. At the same time, leveraging the latest research findings in biomechanics and sports science can optimize and improve opera movements, thereby reducing the risk of physical injury to performers. Additionally, the application of AI technology can offer more precise and efficient support for establishing a professional health protection system for opera performers. For example, we can develop a warning system for action risks based on opera training. We also use AI technology to dynamically monitor training loads and make timely adjustments to subsequent training according to real-time monitoring results. Additionally, we can leverage artificial intelligence technology to establish an intelligent management platform for the occupational health protection of opera performers, enabling real-time monitoring of their health status and training effectiveness, and providing personalized health management and risk warning services based on this information.

According to the above analysis, the rapid development of artificial intelligence technology has brought new opportunities for opera performances. The introduction of intelligent equipment and technologies can not only enhance the safety of opera performances and provide actors with more precise training guidance but also optimize opera movements through scientific guidance, reducing the risk of physical injury. At the same time, the application of big data, artificial intelligence, and other technological means can offer more accurate and efficient support for the occupational health protection system of opera performers, contributing to the continuous development of opera art in both inheritance and innovation.

4. Organizational Change: Self-Renewal of Industry Ecology

The reform of the organizational management structure is the key to the self-renewal of the ecological environment in every industry,[8] and the field of Chinese opera is no exception. In the process of promoting the construction of

a professional health guarantee system for opera actors, we can try to carry out comprehensive reform and innovation of the organizational structure and governance mode of the opera industry from multiple perspectives.

The troupe, as the basic unit of the opera industry, directly affects the construction of the professional health protection system for opera performers. Therefore, modernization can be carried out to improve its governance level and efficiency. First, a scientific performance evaluation system can be established, incorporating indicators such as the health status of actors and training effectiveness into the assessment scope. This will encourage troupes to pay more attention to the professional health protection of actors, improving their training quality and performance level. Second, internal supervision and self-discipline mechanisms within the troupe can be strengthened (such as establishing an internal cross-sector governance committee). By setting up a comprehensive supervision mechanism, it ensures that troupes fulfill their responsibilities and obligations in building the professional health protection system for actors. At the same time, strengthening supervision and guidance of troupes through means such as establishing self-regulatory organizations in this field can further promote the healthy development of the entire opera industry.

In addition, the public's awareness of the occupational health protection system for opera performers directly impacts its development. Therefore, it is necessary to enhance public education on this issue. We can collect and provide feedback on public opinions and suggestions through various means, such as building new media platforms, which will offer valuable references for continuously improving the occupational health protection system for opera performers. At the same time, we need to strengthen vocational education for opera performers to improve their professional ethics and self-protection awareness, which will help reduce physical injuries and health risks caused by unreasonable training.

In summary, organizational reform is a critical measure for the self-renewal of China's opera industry. By modernizing theater troupes, strengthening internal supervision and

self-discipline mechanisms, as well as enhancing public awareness and actors' professional standards, we can comprehensively promote the construction and development of a system for ensuring the occupational health of opera performers. These measures will encourage troupes to pay more attention to the occupational health of their actors, improve training quality and performance levels, while also fostering public recognition and support for the system of occupational health protection for opera performers, laying a solid foundation for the sustainable development of the opera industry.

5. Suggestions for Systematic Reconstruction

In order to build a perfect occupational health guarantee system for opera actors, we need to develop paths from multiple perspectives such as system innovation, technology empowerment and cultural reconstruction.[9] In terms of institutional innovation, a three-tiered support system can be established. The first tier is to establish the basic support layer, which mainly includes work injury insurance and medical insurance as fundamental social security systems. These systems can provide actors with basic economic compensation and medical protection, alleviating their financial burden when facing occupational injuries. The second tier focuses on formulating policies and measures tailored to the unique characteristics of opera performers' careers. For example, a specialized work injury insurance system for opera performers could be established to improve their benefits. Additionally, an opera performer health fund could be set up to offer more comprehensive health support. The third tier involves emergency measures for sudden situations. For instance, establishing a "green channel for opera medical care" and equipping it with specialists familiar with special injuries can ensure that opera performers receive timely and effective treatment in emergencies. In terms of technology empowerment, continuous efforts can be made to reconstruct the foundational framework of scientific support.[10] On one hand, the latest research findings in biomechanics and sports science can be utilized to provide scientific guidance for the training of opera performers, even seeking the "greatest common divisor"

between artistic pursuits and scientific ethics, attempting to improve and innovate high-risk movements in opera performances. On the other hand, artificial intelligence and other technological means can be used to establish an intelligent management platform for the occupational health protection system of opera performers. This platform can monitor the health status and training effectiveness of opera performers in real-time, and provide personalized health management and risk warning services based on this information.

In terms of cultural reconstruction, it is possible to restructure value systems and industry standards. First, a scientific concept of professional health must be established, gradually moving away from unreasonable moral coercion such as "art above all." Second, there needs to be enhanced vocational education and training for opera performers to improve their professional ethics and self-protection awareness. Finally, a comprehensive system of industry standards and regulations should be established to ensure that opera performers receive adequate protection during performances. At the same time, strengthening internal supervision and self-discipline mechanisms within the industry can help regulate market order and enhance competitiveness. This will contribute to the sustainable development of the opera industry and establish a safeguard system that respects the dignity of actors' lives.

However, in the process of promoting the construction of a professional health protection system for opera performers, we inevitably encounter a series of practical tensions and deep-seated obstacles. These tensions and obstacles stem from multiple aspects, with institutional imperfections being a significant factor. Currently, the relevant laws, regulations, and policy systems are not yet well-established, making it difficult to provide adequate occupational health protection for opera performers. To overcome this challenge, we need to strengthen institutional development, improve related laws and regulations, and provide strong legal and policy support for the construction of a professional health protection system for opera performers. At the same time, technical challenges cannot be overlooked. With the rapid advancement of technology, we need to continuously introduce new technologies and methods to provide more

advanced and efficient technical support and guarantees for opera performers. This requires us to increase investment in technology research and innovation, actively exploring applications of biomechanics, sports science, big data, and artificial intelligence in ensuring the occupational health of opera performers. In addition, conflicts at the cultural level are also a concern. There is a certain degree of difference and conflict between traditional opera culture and modern occupational health concepts. To overcome this resistance, we need to adopt a gradual reform approach, establishing scientific transformation demonstration zones in traditional troupes. By demonstrating practical results, we can persuade conservative forces and promote the modernization of opera culture. In short, we need to take comprehensive measures to overcome various tensions and resistance, and constantly promote the construction and improvement of the occupational health guarantee system for opera actors.

6. Conclusion

The scientific transformation and institutional restructuring of the occupational health protection system for Chinese opera performers is a long-term and arduous task. However, with continuous technological advancements and the joint efforts of all sectors of society, there is reason to believe that this goal can be achieved. The scientific and institutionalization of the occupational health protection system for opera performers is not a betrayal of tradition but an inevitable choice in the evolution of civilization. Only by breaking the tragic narrative of "hard training to become a role" and establishing a philosophy of "dignity for artists" can opera art truly become a living heritage that nourishes the national spirit while preserving cultural roots. In the future, it is necessary to continue strengthening work in areas such as institutional innovation, technological empowerment, and cultural reconstruction, so as to provide more comprehensive and effective health protection services for opera performers, thereby promoting the sustained prosperity and development of opera art and inheriting excellent traditional Chinese culture.

Acknowledgements

This work was supported by a youth project grant from Beijing Federation of Social Science Circles (Grant No. 23YTC052) and a general scientific research project grant from Beijing Municipal Education Commission (Grant No. KM202210049001)

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