

# THE ARTISTIC PERFORMANCE AND CULTURAL INTERPRETATION OF THE CELLO IN CHINESE NATIONAL ORCHESTRAS\*

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## Abstract

This study aims to: 1) present the cognitive content and cognitive differences of different subjects regarding the cello in Chinese national orchestras; 2) analyze the underlying reasons for these cognitive differences; 3) refine the practical knowledge system of integrating the cello into national orchestras; and 4) reflect on the cultural issues involved in the modernization process of Chinese national orchestras. A qualitative research design was adopted. Data were collected from 24 informants, including performers, composers, theorists, audiences, and cultural administrators, through literature analysis and semi-structured interviews. The data were analyzed using thematic and interpretive analysis.

The findings show that: 1) different subjects construct distinct understandings of the cello's function, cultural positioning, and artistic value, despite its general acceptance as a bass-support instrument, with continuing differences in timbre identity and its relationship with traditional Chinese bowed

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instruments; 2) these cognitive differences are shaped by professional roles, institutional positions, and cultural expectations, with performers emphasizing technical adaptation, theorists focusing on sonic structure, administrators highlighting policy legitimacy, and audiences stressing emotional perception; 3) the cello has formed a functional knowledge system centered on ensemble coordination and performance adaptation, though tensions remain between functional efficiency and artistic subjectivity; 4) its integration reflects broader cultural negotiations in orchestral modernization, particularly in relation to cultural identity, hybridity, and institutional governance. The study concludes that the cello should be understood not merely as an imported instrument, but as a culturally reconstructed musical role continuously shaped through performance practice, institutional discourse, and audience reception. It functions as both a sonic bridge and a symbolic medium in the ongoing reconfiguration of Chinese national orchestral culture.

**Keywords:** Cello; Chinese National Orchestra, Multi-subjective Cognition, Ethnomusicology, Cross-cultural Music Integration, Musical Role Construction

## Introduction

The cello, originally a representative instrument of the Western string tradition, has gradually become an indispensable component of the bass section within Chinese national orchestras since the mid-twentieth century. Although the national orchestra is widely regarded today as a symbol of Chinese musical modernity and national cultural identity, a significant cultural paradox arises from the fact that one of its most stable foundational instruments originates from the Western classical music tradition rather than from indigenous Chinese musical forms. Thus, the integration of the cello into Chinese national orchestras represents not merely a technical adaptation of orchestral structure,

but also a profound process of cultural negotiation, aesthetic reconstruction, and modernization within contemporary Chinese music (Liqun & Chan, 2025).

The historical roots of this transformation can be traced back to the early twentieth century, when Chinese music entered an era characterized by intensive interaction with Western musical culture. Following the establishment of the People's Republic of China, national cultural policies strongly promoted the institutionalization and professionalization of modern Chinese national orchestras, which accelerated the modernization of orchestral performance systems throughout the country (Mo et al., 2025). However, as the orchestral structure became increasingly standardized, several limitations of traditional Chinese bass instruments gradually emerged, including insufficient sound projection, instability in tonal support, and restricted technical flexibility within large-scale ensemble settings (Wang, 2021). In response to these structural challenges, the cello and double bass were progressively introduced into the national orchestra and eventually supplanted the gehu as the standard bass instruments. This transformation not only reshaped the orchestral timbre system but also symbolized a broader reconfiguration of cultural authority between Chinese and Western musical traditions.

Contemporary scholarship increasingly views the cello in Chinese national orchestras not only as a technical bass instrument but also as a medium for cultural negotiation and identity reconstruction. By incorporating Chinese melodic materials and regional aesthetics, the cello has gradually developed a localized expressive language while still retaining its Western instrumental characteristics. Simultaneously, its growing prominence within national orchestras has sparked ongoing debates concerning modernization, cultural authenticity, and the evolving relationship between Chinese and Western musical traditions. Consequently, the cello occupies a dual role within

Chinese national orchestras, serving both as a functional orchestral instrument and as a symbolic representation of musical modernity.

Although national orchestras have garnered considerable academic attention, existing studies on the cello primarily focus on compositional analysis, orchestration techniques, or institutional history. Relatively few investigations delve into the cognitive mechanisms, cultural subjectivity, and identity negotiations that underpin its integration into Chinese musical culture (Turner, 2014). In particular, systematic discussions regarding how performers, audiences, and various musical subjects perceive, interpret, and negotiate the cultural significance of the cello within Chinese national orchestras remain notably insufficient.

Therefore, there is an urgent need to examine how the cello, as a Western musical instrument, has gradually evolved into a core component of Chinese national orchestras. This evolution serves as a site for cultural understanding, identity reconstruction, and aesthetic negotiation. Such an investigation not only deepens our understanding of Chinese musical modernization but also offers valuable theoretical insights into broader discussions regarding cross-cultural musical integration and contemporary cultural identity.

## Objectives

1. To present the cognitive content and cognitive differences of different subjects regarding the cello.
2. To analyze the underlying reasons for cognitive differences.
3. To refine the practical knowledge system of integrating the cello into a national orchestra.
4. To reflect on the cultural issues in the modernization process of Chinese national orchestras.

## Literature Review

Existing studies on music cognition, cello performance, and the modernization of Chinese national orchestras indicate that the integration of the cello into Chinese orchestral practice transcends mere technical adjustments; it is also a process influenced by cultural identity, cognitive perception, and cross-cultural negotiation. Research across musicology, ethnomusicology, psychology, and cultural studies increasingly acknowledges musical instruments as both acoustic media and cultural symbols. These perspectives offer a significant theoretical foundation for comprehending the role of the cello within contemporary Chinese national orchestras.

### 1. Research on Musical Instrument Cognition

Research on musical instrument cognition has progressively transitioned from traditional theories of music perception to interdisciplinary approaches that incorporate psychology, neuroscience, and embodied cognition. Early studies primarily concentrated on tonal structure and auditory organization (Krumhansl, 2001), whereas more recent research has shifted its focus to prediction, emotion, and multisensory integration in musical experiences (Correa, 2023).

Contemporary scholarship further posits that instrumental performance is an embodied process that encompasses movement, perception, and the interaction between the body and the instrument (Davidson & Wolpert, 2003). Neuroscientific studies have also demonstrated that long-term musical training fosters neuroplasticity and cognitive development (Loui et al., 2019). Nonetheless, while current research offers significant insights into embodied musical cognition, there remains a paucity of attention regarding how such cognition functions within cross-cultural orchestral systems.

## 2. Subjectivity in Music Cognition

Contemporary research in music cognition increasingly emphasizes the subjective musical experience, focusing on how both performers and listeners interpret music through the lenses of cultural background, training, and emotional response. Studies suggest that musical understanding is shaped by learned expectations and levels of musical expertise (Pearce, 2015). Additionally, neuroscience research highlights the interactions among auditory, motor, and emotional systems during music perception (Vuust et al., 2022).

Embodied approaches further propose that music cognition is closely linked to bodily movement and emotional engagement. Juslin and Västfjäll (2008) demonstrate that musical emotions arise through mechanisms such as memory, emotional contagion, and cognitive evaluation. Although these studies acknowledge the diversity of musical experiences, there remains a relative scarcity of research exploring how cultural identity and cognition are negotiated within cross-cultural orchestral contexts.

## 3. Interdisciplinary Perspectives on Music Cognition

Music cognition has evolved into an interdisciplinary field encompassing psychology, sociology, phenomenology, and ethnomusicology. Scholars increasingly contend that musical understanding is influenced not only by perceptual factors but also by social context, cultural experiences, and embodied interactions (Sloboda, 2005).

Phenomenological studies underscore the intricate relationship between music, consciousness, and lived experiences, particularly in performance contexts (Saint-Germier, 2021). Concurrently, theories of embodied cognition suggest that musical meaning arises from the interplay of sound, movement, and emotion. These perspectives are particularly pertinent for investigating how musicians adapt foreign instruments within new cultural settings. However, existing interdisciplinary research seldom addresses Chinese national orchestras or the cultural negotiations involved in integrating Western instruments, such as

the cello.

#### 4. Domestic and International Research on the Cello

Research on the cello primarily focuses on its historical development, expressive characteristics, and cross-cultural adaptation. Within the realm of Western classical music, the cello has evolved from a supporting continuo instrument into an expressive solo voice, capable of conveying emotional depth and lyrical expression.

Recent studies increasingly regard the cello as a cultural and symbolic instrument, rather than merely a technical medium. In cross-cultural contexts, scholars observe that Chinese musicians have gradually localized the cello through pedagogy, composition, and the integration of Chinese musical aesthetics (Tan, 2023). Furthermore, research on Chinese cello works illustrates how folk materials and Eastern artistic concepts have reshaped the instrument's expressive identity (He, 2021).

Despite these advancements, most existing studies continue to concentrate on performance technique, repertoire, or pedagogy. Research addressing cognitive subjectivity, cultural negotiation, and identity reconstruction within Chinese national orchestras remains relatively limited.

#### 5. Modernization of Chinese National Orchestras and Instrument Cognition

Studies on the modernization of Chinese national orchestras generally agree that contemporary orchestral systems emerged from the combination of traditional Chinese ensemble practices and Western orchestral structures (Zhu, 2020). During this process, the introduction of instruments such as the cello and double bass became significant features of orchestral reform.

Scholars argue that the incorporation of the cello was partly due to the lack of stable low-register support in traditional orchestras (Li, 2018). Simultaneously, the localization of Western instruments reflects broader

cultural negotiations and modernization processes. Baumann (2000) describes this phenomenon as "glocalization," in which imported musical forms are continuously reinterpreted within local cultural contexts.

Recent studies further suggest that instruments carry symbolic meanings related to modernity, cultural capital, and artistic authority. Consequently, the cello in Chinese national orchestras functions not only as a musical instrument but also as a symbol of cultural transformation and identity reconstruction. However, limited research has explored how performers, audiences, experts, and cultural institutions collectively shape these cognitive and cultural meanings.

## **Methodology**

### **1. Research Design**

This study employs a qualitative research design rooted in ethnomusicology to investigate the multi-subjective cognition of the cello within Chinese national orchestras. It aims to explore how various stakeholders—including performers, educators, audiences, and cultural administrators—construct meanings around the cello in cross-cultural orchestral practice.

Rather than treating the cello as a static musical object, this study conceptualizes it as a socially embedded and culturally negotiated sound entity. Consequently, the methodological framework incorporates document analysis, semi-structured interviews, and participant observation, facilitating a triangulated understanding of performance practice, institutional discourse, and audience reception.

The overall design emphasizes interpretive depth and contextual sensitivity, aiming to illuminate how musical meaning is co-constructed across

artistic, educational, and institutional domains within contemporary Chinese national orchestral culture.

## 2. Participants and Sampling

Purposive sampling was utilized to recruit participants with direct experience related to cello performance and orchestral culture. A total of 24 informants participated in the study, including professional cellists, music education experts, concert audiences, and cultural administrators. The selection prioritized experiential relevance and professional insight over statistical representativeness, enabling the study to explore the cello from multiple interpretive perspectives.

## 3. Data Collection

Semi-structured interviews constituted the primary method of data collection. These interviews were conducted either face-to-face or via telephone, focusing on participants' understandings of the cello's musical role, cultural significance, and artistic value within Chinese national orchestras. All interviews were recorded with consent and subsequently transcribed for analysis.

Additionally, literature analysis was performed using sources from CNKI, Wanfang Data, and related musicology databases. This review concentrated on the localization of the cello, orchestral modernization, and cross-cultural music cognition. Participant observation was also conducted during rehearsals and live performances to examine ensemble interaction, timbral adaptation, and orchestral practices in real-world settings.

## 4. Data Analysis

The collected data were subjected to thematic and content analysis. Coding procedures were employed to identify recurring themes related to orchestral integration, cultural negotiation, and cognitive differences among stakeholder groups. Cross-group comparisons further elucidated how the cello

acquires varying meanings across artistic, educational, audience, and institutional contexts.

#### 5. Trustworthiness and Validation

To enhance the credibility of the findings, methodological triangulation was implemented by juxtaposing interview data, observational notes, and literature findings. Additionally, member checking and expert reviews were conducted to improve interpretive accuracy and analytical consistency.

#### 6. Ethical Considerations

This study adhered to standard academic ethical guidelines. All participants provided informed consent, participation was voluntary, and all personal information was anonymized to ensure confidentiality.

## Results

This study employs qualitative research methods, primarily literature reviews and semi-structured interviews, to investigate the multi-subjective perceptions of the cello within Chinese national orchestras. Using the cello as a case study, this chapter systematically analyzes four aspects: the content and differences in perceptions of the cello among various subjects, the underlying reasons for these differences, the practical knowledge system regarding the cello's integration into national orchestras, and the cultural issues arising during the modernization process of Chinese national orchestras. These analyses are closely aligned with the research objectives.

#### 1. The Changes in the Sound of the National Orchestral Ensemble Before and After the Addition of the Cello

This section presents the interview-based findings regarding the sonic transformation of Chinese national orchestras following the integration of the cello.

The integration of the cello into the Chinese national orchestra represents not merely the addition of a new instrument but also a significant transformation of the orchestra's sonic structure and aesthetic orientation. More importantly, it reflects the gradual modernization of the Chinese national orchestra from a traditional ensemble toward a large-scale orchestral system characterized by symphonic traits.

Before the introduction of the cello, traditional Chinese orchestras were typically characterized by strong high-frequency melodies and relatively weak mid- and low-frequency support. Traditional ensembles emphasized melodic lines and horizontal musical development, while stable bass organization and harmonic layering were limited. Although instruments such as the bass *erhu* and *daruan* offered some low-register functions, they were less effective in sustaining tone, controlling dynamics, and achieving spatial depth, particularly in large performance venues.

The addition of the cello significantly reshaped this sonic structure. With its sustained tone and stable low register, the cello fortified the bass foundation of the orchestra and enhanced the overall depth, balance, and spatial layering of the ensemble. In large-scale works, the cello not only supports the bass line but also links melodic and harmonic sections, contributing to a more symphonic orchestral texture.

Simultaneously, the cello prompted changes in compositional thinking within Chinese national orchestras. Traditional orchestral writing primarily focused on melodic expression, whereas the inclusion of the cello encouraged a greater emphasis on harmony, polyphonic texture, and structural coordination.

Interview data suggest that several composers and performers perceived a shift from linear melodic thinking toward layered orchestration after the cello's introduction.

Consequently, orchestral composition gradually shifted from a linear melodic model toward a more layered and three-dimensional orchestration approach. Furthermore, the cello influenced the aesthetic character of the orchestra. Traditional national orchestras often emphasized lightness, agility, and folk-style expression. In contrast, the cello introduced a richer low-frequency resonance and heightened emotional tension, imparting modern national orchestral works with a broader spatial sense and greater dramatic intensity.

However, this transformation has also sparked debate. While the cello enhances orchestral depth and expressive capacity, some scholars argue that an excessive reliance on Western bass systems may dilute the original tonal identity of traditional Chinese ensembles. This reflects a minority but notable critical perspective among respondents regarding cultural and aesthetic balance.

Overall, the inclusion of the cello has reconstructed the bass system, expanded orchestral texture, and accelerated the modernization of Chinese national orchestras.

## 2. Cognitive Content and Differences of Different Subjects Regarding the Cello

This section summarizes the findings from interviews regarding how various stakeholder groups perceive the cello within Chinese national orchestras. The results indicate that, while these groups share certain common perceptions, they also exhibit significant differences in their interpretations.

At the functional level, participants generally agree that the cello has become an indispensable component of the national orchestra. This functional consensus was emphasized repeatedly by interviewees. The cello is widely recognized as a stable bass foundation that enhances sonic balance, structural depth, and overall orchestral coordination.

However, more pronounced differences emerge in discussions concerning timbre and aesthetics. Most participants describe the cello's sound

as warm, stable, and emotionally expressive, a view that is particularly dominant among performers and audience members. Conversely, some performers, educators, and critics argue that the cello's role in the orchestra has become overly functionalized, which limits the recognition of its technical complexity and independent artistic identity.

Divergent perspectives also surface in discussions about the cello's relationship with traditional Chinese bowed-string instruments. While many audience members and policy-oriented stakeholders emphasize complementarity, performers and educators are more inclined to highlight issues of substitution and competition. This indicates a clear divergence in interpretive stances based on roles.

Questions of identity generate significant tension among stakeholders. Although the cello has long been integrated into national orchestras at both practical and institutional levels, its cultural identity remains somewhat ambiguous. Some participants view it as a natural member of the orchestra, while others continue to perceive it as a foreign instrument within a traditionally Chinese musical context. This reflects an unresolved positioning of identity within orchestral practice.

### 3. The underlying reasons for cognitive differences

This section presents interview-based analytical findings regarding the mechanisms underlying perceptual differences. The findings indicate that these differences are shaped by multiple interacting factors.

Firstly, cognitive differences are closely linked to the distinct roles that stakeholders occupy in the production and circulation of music. Performers, educators, composers, administrators, and audiences engage with the cello through diverse forms of experience and responsibility.

Secondly, institutional environments and professional training further reinforce these differences. Participants with varying training backgrounds

demonstrated systematically different interpretive frameworks. Through prolonged involvement in specific educational systems and organizational structures, individuals internalize distinct artistic values.

Thirdly, personal experience plays a crucial role in shaping cognition. Many interviewees connected their perceptions of the cello to specific performance or learning experiences. Emotional memory, artistic training, performance experience, and historical encounters all significantly influence perception.

Moreover, practical conflicts within rehearsal and performance environments further exacerbate cognitive differences. These discussions are not merely technical; they also encompass questions of cultural authority, artistic legitimacy, and identity construction.

#### 1.4 The Practical Knowledge System of Integrating the Cello into a Folk Orchestra

This section synthesizes findings on the practical knowledge system derived from performance, education, and institutional practice. At the performance level, the integration of the cello prioritizes functionality, emphasizing bass support, sonic stability, and overall harmony.

This focus leads to the establishment of implicit ensemble rules that guide performance coordination. At the educational and theoretical levels, this experience has been progressively standardized into transferable teaching knowledge. However, tensions persist between standardization and creativity.

In terms of cultural governance and social acceptance, the use of the cello is embedded in institutional expectations concerning stability and legitimacy. Interview findings indicate that 'successful integration' is often linked to institutional acceptance rather than solely artistic criteria.

Overall, the integration of the cello represents not a process of complete assimilation but a continuous negotiation between functional control and artistic expression.

### 1.5 Cultural Issues in the Modernization Process of Chinese National Orchestras

This section presents findings based on interviews regarding cultural tensions in the process of modernization. This study identifies several cultural issues that arise from the integration of the cello into Chinese national orchestras. At the levels of performers, researchers, and cultural discourse, the incorporation of the cello reflects inclusiveness and the capacity for modernization. However, it also raises concerns about asymmetrical discourse power and cultural tension. Some respondents expressed worries related to cultural balance and interpretive dominance.

From the perspectives of audiences and critics, the cello is primarily experienced through emotional and auditory evaluations. Descriptors such as 'harmonious,' 'pleasant,' and 'stable' were frequently mentioned. Ultimately, the relationship between cultural preservation and adaptation is not static but is dynamically constructed in practice. This finding emphasizes an ongoing process of cultural negotiation rather than a fixed equilibrium.

## Discussion

1. Presenting the cognitive content and differences of different subjects regarding the cello.

This study analyzes the cognitive content and differences among various subjects regarding the cello, revealing that their perceptions of its role are not merely a collection of scattered opinions but rather a structurally differentiated pattern formed around several core issues. These differences in perception are not accidental disagreements; instead, they are an inevitable outcome of the modernization and cultural subjectivity construction of Chinese national orchestras. Collectively, these differing perceptions constitute a dynamic field in which the role of the cello is continually reshaped, reflecting the profound

structural tensions inherent in the modernization process of Chinese national music.

At the functional level, various stakeholders have achieved a significant consensus: the cello has become an indispensable bass support within the national orchestra, with its structural status institutionalized in performance practices, educational systems, and cultural governance. However, notable differences exist in perceptions of aesthetics and expressiveness. Audiences and administrators emphasize functional values such as stability, warmth, and harmony, while performers and educators express concerns regarding the compression of artistic potential and the diminishing of timbral heterogeneity. This divergence illustrates a shift from receptive aesthetics to reflective aesthetics. In terms of the relationship with traditional Chinese bowed string instruments, stakeholders generally acknowledge a coexistence characterized by complementarity, substitution, and competition.

However, professional stakeholders are more attuned to the structural substitution and power imbalances arising from historical choices and institutional arrangements, whereas non-professional stakeholders tend to focus on auditory complementarity and effects. Regarding identity, the cello occupies a state of tension where it is 'functionally internalized but not yet fully culturally internalized.' Institutional acceptance does not automatically equate to cultural identity; the identity of its members continues to require interpretation and negotiation at the levels of discourse and symbolism.

## 2. Cognitive Content and Differences of Different Subjects Regarding the Cello.

Different subjects do not possess a singular, stable, or unified perception of the cello. Instead, they exhibit a highly diverse, layered, and mutually interdependent structural characteristic. Performers tend to comprehend the cello through the lenses of technical feasibility, physical experience, and functional value; composers and theorists emphasize its sonic potential,

structural significance, and artistic concepts; cultural administrators focus on its social symbolism, policy alignment, and public recognition; while audiences and music critics attribute meaning to it through emotional experiences, cultural memories, and identity projections. These cognitive aspects not only overlap but are also highly dynamic, collectively forming a complex field of meaning for the cello within the context of contemporary Chinese folk music.

The cognitive differences among various subjects are not merely misunderstandings or biases but rather the inevitable outcome of music as a socio-cultural practice that is continuously constructed within distinct structural positions, experiential pathways, and power dynamics. Acknowledging and understanding these differences not only illuminates the multiple roles of the cello within the national orchestra but also establishes a theoretical foundation for further investigation into its usage controversies, integration pathways, and future development.

3. Refining the practical knowledge system for integrating the cello into a folk orchestra.

The practical knowledge system for integrating the cello into the national orchestra is fundamentally a comprehensive framework centered on functionalism, operating through a consensus on rules and allowing for continuous adjustments across various cultural and institutional logics. This system systematically reconstructs performance thinking, aesthetic orientation, technical parameters, and educational philosophy, guiding performers to transition from being 'soloists' or 'voice leaders' within the Western context to 'collaborative professional performers' who strive to be invisible, supportive, and collaborative. The core focus is not on achieving complete assimilation of timbre or technique, but rather on emphasizing usability, stability, and functional effectiveness within the overall structure of a national orchestra. However, this practical knowledge system exhibits a significant duality: while it

offers a viable pathway for the cello's legitimate existence in the realm of Chinese national orchestral music, it also risks compressing artistic integrity and performer subjectivity in favor of functional efficiency. Thus, its true value lies not in the further entrenchment of rules, but in its capacity to gradually cultivate a more inclusive and creatively flexible practical space. This must be done while respecting the ensemble's function and cultural context, thereby enabling the cello to achieve a dynamic balance between functional value and artistic subjectivity within national orchestras.

#### 4. Reflecting on Cultural Issues in the Modernization Process of Chinese National Orchestras

The modernization of Chinese national orchestras fundamentally represents a continuous negotiation process centered on cultural subjectivity, modern imagination, and institutional governance, rather than a linear evolution or mere technological upgrading. The introduction of foreign elements, such as the cello, is not the core issue; rather, it serves as a crucial medium that highlights the potential cultural tensions, power structures, and value choices inherent in this process.

Research indicates that the primary cultural challenge confronting the modernization of contemporary Chinese orchestras lies not in the question of 'whether to absorb foreign elements,' but rather in how to absorb them, who should lead this process, and what aesthetic logic and institutional mechanisms should be employed for their transformation. When foreign elements become overly functionalized and symbolized, modernization risks devolving into a one-way dominance of technological and governance rationality, which tends to compress artistic subjectivity and cultural diversity. Conversely, when the concept of 'balance' is absolutized, it may stifle genuine creative vitality.

Therefore, the modernization of Chinese national orchestras should not aim for a fragile balance or superficial integration; instead, it should endeavor to construct a cultural ecosystem deeply rooted in national culture, one that

allows for the coexistence of differences and is capable of self-renewal amid tension and conflict. Within this framework, foreign elements such as the cello should no longer be perceived as 'others' that require careful safeguarding; instead, they should be actively transformed and creatively utilized in appropriate contexts and levels, thus becoming vital catalysts for the ongoing growth of the overall vitality of national music.

## Recommendation

Building upon the analytical framework established in this study, the following recommendations are proposed not only as directions for future academic inquiry but also as stakeholder-oriented implications for performers, researchers, educators, and cultural planners within the Chinese national orchestral system.

### 1. Recommendations for Instrumental Practitioners and Orchestral Performers

For performers, instrumental practitioners, and orchestral arrangers, future research should extend comparative analyses to other Western instruments integrated into Chinese national orchestras, such as the double bass, clarinet, and percussion instruments.

Such comparative studies would enhance practitioners' understanding of how different instruments assume differentiated functional hierarchies, timbral responsibilities, and expressive constraints within ensemble settings. This is particularly relevant for orchestral interpretation and arrangement practices, where cultural negotiation and aesthetic compromise are structurally embedded in performance decisions.

### 2. Recommendations for Music Technologists and Acoustic Researchers

For music technologists, acousticians, and cultural analysts, future research should integrate qualitative cultural interpretation with acoustic and

psychoacoustic measurement approaches. This interdisciplinary direction enables a more systematic examination of how culturally embedded performance norms are translated into measurable sonic outcomes, thereby supporting the analysis of the relationship between artistic intention, technical regulation, and auditory perception. Such integration is particularly valuable for professionals involved in sound engineering, recording production, and performance documentation within orchestral institutions.

### 3. Recommendations for Ethnomusicologists and Cultural Policy Researchers

For ethnomusicologists and cultural policy researchers, future studies should focus on marginal, experimental, and non-institutional orchestral practices that exist outside the mainstream state-supported systems. These practices often reveal alternative pathways to modernization, informal transmission structures, and hybrid performance logics that are underrepresented in official discourse. Investigating these contexts can deepen our understanding of cultural plurality, artistic resistance, and decentralized innovation within the development of Chinese orchestras. This direction is particularly significant for research on the governance of intangible cultural heritage and grassroots musical transformation.

### 4. Recommendations for Music Educators and Cultural Development Planners

For music educators, curriculum developers, and cultural policy planners, conducting longitudinal studies across generations of performers, educators, and audiences is strongly recommended. Such research would provide insights into how modernization discourses, institutional frameworks, and aesthetic values are transmitted, contested, and transformed over time. Additionally, it enables the evaluation of whether current orchestral systems maintain structural stability or undergo adaptive reconfiguration in response to technological and cultural changes. This perspective is essential for informing

sustainable curriculum design, talent cultivation strategies, and long-term cultural development policies.

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