



Research Article

Comparative analysis of Uzbek and Chinese national musical instruments

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Abstract

The aim of this study is to comparatively examine Uzbek and Chinese national musical instruments from an organological perspective. Based on the assumption that cultural interactions—particularly those developed through the Silk Road over historical processes—have generated both similarities and differences among musical instruments across different geographical regions, the study is grounded in the hypothesis that structural features, sound production mechanisms, performance techniques, and functional uses of instruments in both musical cultures may exhibit convergences as well as divergences. The research is designed within the framework of a qualitative research approach and adopts a comparative research model. During the data collection process, academic sources in the fields of organology and musicology, instrument catalogs, and documents related to performance practices were examined; the obtained data were analyzed using descriptive and comparative analysis techniques. Within the scope of the study, five pairs of instruments representing wind, string, and percussion categories (nai–di, chang–yangqin, gijak–erhu, ud–pipa, nagora–bangu) were analyzed. The findings indicate that the compared instruments share significant similarities, particularly in terms of sound production principles and fundamental structural characteristics. However, notable differences were also identified with respect to materials used, physical dimensions, timbral qualities, and performance contexts. These differences appear to stem from each culture’s distinct musical aesthetics, historical development processes, and functional needs. The results of the study demonstrate that musical instruments are not merely technical constructs but also tangible indicators of cultural interaction. The research highlights the importance of cross-cultural comparative studies in the field of organology and contributes to a deeper understanding of the relationships between musical cultures. It is expected that the findings will provide a foundation for more comprehensive and interdisciplinary studies in the future. Further detailed organological research on Uzbek and Chinese national musical instruments is recommended.

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Introduction

The musical arts of Uzbekistan develop in close connection with various world cultures, especially those of the East (Levin, 1999; Kartomi, 1990). Of particular interest in this regard are the centuries-old cultural contacts between Uzbekistan and China, during this process, the interaction and mutual influence of national musical instruments developed, facilitated by the Great Silk Road (Liu, 2010; Hansen, 2012). In the era of globalization, there is a vigorous revival of cultural relations between New Uzbekistan and China (UNESCO, 2017). The close musical ties between our peoples are acquiring qualitatively new features at the current stage of development, the study of which is necessary today based on innovative research methodologies (Stobart, 2008).

One such influential factor is musical instruments, an invaluable treasure for every nation. They serve as an inexhaustible source for determining the cultural level of a given people (Baines, 1992). Even in ancient times, musical instruments were a means of aesthetic education and interethnic communication (Kartomi, 1990). And today they

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occupy an important place, being a specific form of reflection of everyday life, history, worldview, and artistic impulses (Merriam, 1964). And today they occupy an important place, being a specific form of reflection of everyday life, history, worldview, and artistic impulses.

Folk instrumental art, through the efforts of many generations over the centuries, has emerged as a unique artistic phenomenon, of considerable interest not only to science, but also to contemporary musical creativity (Nettl, 2005). Understanding its many properties and constituent elements opens up vast horizons for enriching various areas of scientific and creative activity.

The significance of music lies in the fact that it requires no translation into other languages. It unites people of all nations equally and is accessible to everyone, even the most untrained listeners (Blacking, 1973). Even in ancient times, music played a significant role in human life. It is also necessary to mention the therapeutic effect of music, which calms people in moments of grief, gives the opportunity to feel joy, infuses strength into a tired person – unites people in joy and sorrow (Koelsch, 2010). Depending on the nature of the emotional influence, types of music were formed, intended for festive ceremonies and for educational purposes (Merriam, 1964).

Historically, the instrumental culture of each nation was formed through a process of interaction and mutual influence, for which the Great Silk Road played a significant role (Hansen, 2012). In the general classification of musical instruments, which are divided into main groups according to the methods of sound production, during the process of functioning they were subject to changes in accordance with the national character of music and, ultimately, became truly national instruments (Hornbostel & Sachs, 1914/1961). In this regard, it is very interesting to identify the factors of commonality and difference between Uzbek and Chinese national musical instruments when developing a model of their interaction and interrelationship.

Purpose of the Study

The aim of this study is to examine the organological similarities and differences between Uzbek and Chinese national musical instruments through a comparative approach. In this context, the study seeks to conduct a comparative organological analysis of selected instruments (Bangu, Chang, Di, Erhu, Gijak, Nagora, Nai, Pipa, Ud) by analyzing their structural features, sound production mechanisms, performance techniques, and functional uses.

Method

This study was designed within the framework of the qualitative research paradigm. Given that the objective is to reveal the similarities and differences between Uzbek and Chinese national musical instruments, a qualitative comparative research design was employed. Comparative research methods enable the analysis of phenomena belonging to different cultures or systems according to specific criteria (Hantrais, 2009; Pickvance, 2001). For this reason, it is a widely used scientific method, particularly in musicology and organology studies. This approach is especially suitable for comparing instruments within Uzbek and Chinese musical cultures.

In addition, an organological analysis approach was adopted in this study. Organology is defined as a discipline that examines the structural features, sound production mechanisms, classifications, and cultural contexts of musical instruments (Baines, 1992; Kartomi, 1990). In this regard, the instruments were analyzed not only in terms of their physical structures but also in terms of their performance techniques and functional uses.

During the data collection process, the following sources were utilized: academic literature in organology and musicology, instrument catalogs and historical sources, visual and technical descriptions, and written and visual documents related to performance practices. Accordingly, the study was supported by the document analysis method (Bowen, 2009).

Instruments Examined

Within the scope of the study, instruments representing Uzbek and Chinese musical cultures and belonging to similar organological categories were selected through purposive sampling. The following instrument pairings were examined:

- Wind instruments: Uzbek Nai – Chinese Di
- Struck string instruments: Uzbek Chang – Chinese Yangqin

- Bowed string instruments: Uzbek Gijak – Chinese Erhu
- Plucked string instruments: Uzbek Ud – Chinese Pipa
- Percussion instruments: Uzbek Nagora – Chinese Bangu

These comparisons and pairings were made based on the sound production methods of the instruments (aerophones, chordophones, membranophones, etc.). This classification approach is based on the Hornbostel–Sachs system of instrument classification (Hornbostel & Sachs, 1914/1961).

Comparison Criteria

The comparison of the instruments was conducted according to the following criteria, which are widely used in the organological literature (Baines, 1992; Kartomi, 1990):

Table 1. Criteria for the Comparative Analysis of Uzbek and Chinese Instruments

Criteria	Details
Structural Features	Body form, materials used, string, membrane, or pipe structure
Sound Production Mechanism	Air vibration, string vibration, or membrane vibration
Performance Techniques	Finger usage; use of bow, plectrum, or stick; articulation techniques
Timbre and Sound Characteristics	Tone color, dynamic capacity
Functional Use	Role as solo, accompaniment, or within an orchestra, use in traditional and modern repertoire
Cultural and Historical Context	Origin of the instrument; processes of intercultural interaction

Data Analysis

The data obtained were evaluated using descriptive and comparative analysis techniques. Each pair of instruments was analyzed separately according to the determined criteria, and subsequently, similarities and differences were identified and presented thematically.

Findings

Uzbek nai and Chinese di

The Uzbek nai is identical to the Chinese wind instrument di. Both nai and di are made primarily of bamboo. They are cylindrical tubes with a specific number of playing holes. The instruments have diatonic scales. The sound production methods and playing techniques are identical.

The nai is a widely used woodwind instrument in Uzbekistan. It is made from bamboo, reed, beechwood, and metal (brass and tin). The most commonly used types are bamboo and wooden nai. The instrument is shaped like a cylindrical tube, 20-30 mm in diameter and 450-520 mm in length. The nai is played with six fingers: three on the left hand and three on the right. The seventh hole, the "labium," is located at the top of the instrument. Depending on the pitch of the sound being produced, the holes are either completely or partially covered by the fingers (Tashmatova, 2006: 21).

The nai can be used to perform Uzbek folk melodies, works by Uzbek composers, and classical music from around the world. This instrument, made of bamboo, was acquired specifically for the Museum of Musical Instruments at the State Conservatory of Uzbekistan.



Figure 1. Uzbek nai (Tashmatova, 2006: 20)**Figure 2.** Chinese di (Web 2)

The di is an ancient Chinese woodwind instrument. "It consists of a bamboo tube (the string bindings of the tube are covered with black lacquer), 610-630 mm long, with six playing holes" (Allender, 1958: 31). The di's barrel is most often made of bamboo or reed, but di's made of other types of wood are also available. The original ancient Chinese name for this instrument was hengchui. "The musical section of the History of Zan states that the hengchui is a transverse flute, an instrument called hu (meaning foreign)" (Vyzgo, 1980: 25).

**Figure 3.** Setting up the game on nae (Tashmatova, 2014: 16)**Figure 4.** Setting up the game on di (Web 2)

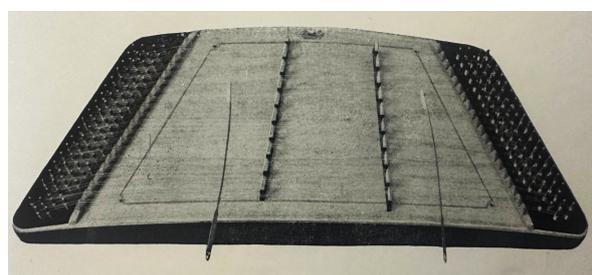
When playing on the di, six fingers are also used: three fingers - the index, middle and ring fingers - to cover the first, second, third, and three fingers of the right hand - the index, middle and ring fingers - to cover the fourth, fifth and sixth holes. Depending on the pitch of the sound being produced, the holes are either completely or partially covered with fingers. The air-blow hole, called the "labium," is also located near the closed end of the barrel, as on the naya. The di can be used to play Chinese folk melodies, works by composers, and classical music from around the world. It is used in solo, ensemble and orchestral performances.

Unlike the nay, the di's barrel is tied with thread in 18 places to prevent cracking and coated with black lacquer, while the nay's barrel has iron rings in 15 places to perform the same function. The positioning, sound production, and playing techniques for these instruments are identical.

Uzbek chang and Chinese yangqing

We find many similarities in appearance, construction, sound production methods, and playing techniques between the Uzbek chang and the Chinese yangqing². The chang, common in Uzbekistan, is part of the string-percussion family and is one of the oldest musical instruments common in Central Asia. He is both a soloist and an accompanist in various ensembles and orchestras, not only of Uzbek folk instruments, but also in other groups.

The instrument is trapezoidal in shape, consisting of a flat wooden box. The soundboard has two rows of bridges, dividing the strings into low and high sections. Metal strings are stretched horizontally above the soundboard. The ancient chang has 40 strings: the first is single, the others are triple. Its scale is diatonic. The strings are attached to metal pins on the left side and to metal tuning pegs on the right, and are tuned with a special metal key. The sound is produced using bamboo sticks (Tashmatova, 2006: 39).



² Yangqin is a unique exhibit (inventory numbers 464, 642) of the Museum of Musical Instruments at the State Conservatory of Uzbekistan.

Figure 5. Uzbek chang (Tashmatova, 2006: 38)**Figure 6.** Chinese yangqin (Alender, 1958: photo № 27)

The modern chang is similar in appearance to the traditional one. Unlike the traditional chang, it has three long legs and a pedal mechanism mounted on the middle leg for timely damping of sounds.

Thanks to improvements, the modern chang's scale has become chromatic and covers a range of up to 3.5 octaves. This chang can be used to perform not only classical Uzbek traditional music, but also works by Uzbek composers and international classics.

When playing the chang, one can use strokes such as tremolo, single and double strokes, pizzicato with the fingers or the other end of the sticks, and glissando. "The chang has a fairly loud, long-lasting sound with a bright, resonant timbre" (Karomatov, 1972: 150). This chang has 75 strings, stretched in triple rows. This instrument was made by master A. Abdugafurov in 1983.

**Figure 7.** Setting up a game on the chang (Tashmatova, 2017: 222)**Figure 8.** Setting up a game on the yangqin (From a personal archive of Tashmatova A.)

The yangqin is a Chinese stringed percussion instrument similar to the cymbal. The instrument is similar in appearance to the Persian santur. The name itself suggests that the instrument is not of Chinese origin. "Yang" in Chinese means "foreign," meaning the instrument came into use from outside the country. "It was brought to China during the Ming Dynasty (1368–1644) from Europe, where, in turn, it arrived from the Arab East at about the same time" (Gen-Ir, 2011: 259; Thrasher, 2008).

Its trapezoidal body is crafted from hardwood. The modern instrument is strung with 124 metal strings, mostly bronze. They are attached to metal pins on the left and to metal tuning pegs on the right, which are tuned with a special key. It is played with bamboo sticks, which are longer than those of the chang. The instrument's body is larger and wider than that of the chang. Like the chang, it is preferred by girls.

The yangqin is used as a solo instrument, in ensembles, and as an accompaniment in Chinese opera and theatrical productions. It can be used to play folk melodies, works by composers, and foreign music. A variety of strokes, like those on the chang, are acceptable. Unlike the chang, where a pedal is mandatory, the yangqin does not always have a pedal mechanism.

Uzbek gijak and Chinese erhu

The gidzhak is a bowed string instrument, widespread in Uzbekistan, Tajikistan, Azerbaijan, and other Eastern countries. It consists of a spherical wooden body, a short, rounded neck, and a tuning peg, and has three steel strings. "The bow (bow-shaped) is made of horsehair" (Belyaev, 1933: 54). The neck is made of apricot, the body is hollowed out of mulberry, covered with a membrane of bullhide, and the tuning pegs are made of apricot wood. The string rest is made of apricot wood. A long metal pin is located under the body for securing the instrument to the floor.

Initially, ghidjaks were two- and three-stringed, with bodies made of gourd and coconut. Four-string varieties later emerged. Ghidjaks were primarily designed with tuning pegs and tuning pegheads. Tuners come in various shapes, including round, scalloped, and others. The body is made of coconut.

The modern ghidjak has the same shape as the traditional one. Unlike the traditional design, the top of the neck is thinner, the bottom is thicker, and the face is flat. The bow is replaced by a violin bow. The body of modern ghidjaks is made of wood, made using chiselling and rivets. In practice, the hollowed-out version is primarily used. It has four metal strings. The ghidjak is played with four fingers of the left hand: index finger (1), middle finger (2), ring finger (3), and little finger (4). The open string, played without using a finger, is marked 0.



Figure 9. Uzbek ghidjak (Tashmatova, 2006: 78)



Figure 10. Chinese erhu (From a personal archive of Tashmatova A.)

The ghidzhak is one of the most dynamic instruments of the bowed string group, primarily performing a melodic function and playing a leading role in ensembles and orchestras of Uzbek folk instruments. The ghidzhak's stroke technique is very diverse, and the instrument is rich in expressive potential. This instrument was made by master craftsman S. Kadyrov in 1995. Designers: A. Petrosyants and S. Didenko (Tashmatova, 2006: 79).



Figure 11. Ghidjak playing technique (Tashmatova, 2014: 135)



Figure 12. Erhu playing technique (Web 3)

The erhu³ is a Chinese bowed string instrument. The name erhu is composed of two Chinese words: "er" meaning "two," and "hu" meaning "huqin," of which the erhu is a variety. It is one of the most popular instruments in China. Used not only as a solo instrument, but also as an accompaniment in ensembles and orchestras for musical drama and opera, the erhu possesses rich expressive capabilities that allow performers to explore diverse sound worlds. This instrument is used not only in professional performance, but also in amateur music-making among various strata of the urban and rural population.

The erhu has a hexagonal wooden body, though octagonal and round versions are sometimes found. The body is covered with snakeskin on one side and a wooden soundboard with openwork holes on the other, which act as a

³ The erhu is housed in the Museum of Musical Instruments at the State Conservatory of Uzbekistan, where it is a priceless exhibit, item no. 242.

resonator. The instrument's round neck extends through the body and attaches to a foot at the bottom, which rests on the right knee. The tuning peg head is curved backward. The strings are attached to the footrests at the bottom and to the tuning pegs at the top. The erhu is played with a bow whose hairs are held between the strings, alternately on both strings. With the fingers of the left hand, press both strings simultaneously, but without pressing them against the fingerboard.

The gijak and erhu differ in the number of strings and bow position: on the gijak, the bow is held from above, while on the erhu, it's held from below. Both instruments have metal strings. The playing techniques and sound production methods are identical. Both instruments can be used to perform folk melodies, works by composers, and classical music from around the world. The gijak and erhu have wooden, fretless necks. They are technically flexible instruments.

Uzbek oud and Chinese pipa

The ud is a plucked string instrument, widely used in Uzbekistan since ancient times. It consists of a large, wide, riveted mulberry body with a spruce soundboard, a short beech neck, and a backward-curved tuning peghead. The tuning pegs are made of apricot wood, and the strings are silk. The soundboard has a resonator hole, inset with a fir rosette with openwork carving. The hole diameter is 80 mm. The oud was originally single-stringed, but later two-, three, and four-string varieties appeared.



Figure 13. Uzbek oud (Tashmatova, 2006: 56)



Figure 14. Chinese pipa (Tashmatova, 2017: 24)

The modern oud has eleven strings, of which the first through fifth are paired, and the sixth is a single string. The silk strings have been replaced by gut and metal ones. Each pair of strings has the same cross-section and is tuned in unison, so they count as one string. The oud has a soft and gentle sound, making it a chamber instrument. The oud is played with a pick. The instrument's timbre is matte. It can be used for single and double strokes, tremolo, pizzicato, and various melismas. Cantilena-style pieces are more suitable for it (Tashmatova, 2006: 59). The privilege of the modern oud is that it can be used to perform Uzbek classical music and works by Uzbek composers. This oud was made by master craftsman U. Zufarov in 1949.



Figure 15. Setting up the playing of the oud (Tashmatova, 2014: 101)



Figure 16. Setting up the pipa playing (From a personal archive of Tashmatova A.)

One of the most common plucked string instruments in China is the pipa. The name pipa derives from the way the instrument is played: pi refers to the downward movement of the fingers along the strings, and pa refers to the upward movement. The pipa has a wooden pear-shaped body without sound holes and a short neck with a glued-on scalloped fingerboard. “Farmer connects the penetration of the lute into China with the marriage of the Chinese Emperor Wu-ti to a Turkic princess (568), who brought with her a musician who played a “barbarian” instrument, that is, Farmer explains, the Turkmen barbat” (Vyzgo, 1980: 18).

The ancient pipa's neck had four frets, and its range was very limited. As the instrument gradually evolved, frets began to appear on the flat top, in the form of narrow wooden sticks, reaching up to 16 or more. The strings were twisted silk and attached to tuning pegs on one side and a tailpiece on the other.

The pipa is played seated, with the bottom of the body resting on the knees and the neck on the left shoulder. The design and construction methods of the oud and pipa differ. The oud's tuning peg is curved backward, while the pipa's tuning peg is curved forward. Unlike the oud, the pipa has four strings. The oud is both a fretted and fretless instrument; the modern pipa has 30 frets, six of which are on the neck and 24 on the body. The playing position is slightly different. The oud is held horizontally, while the pipa is held vertically at an 80-degree angle. The oud's strings are nylon gut, while the pipa's are metal, which creates a distinct timbre. The pipa's sound is brighter due to its metal strings.

Playing techniques and sound production methods also differ. The oud is played with a plectrum. The pipa is played with artificial nails attached to the nails of the right hand with electrical tape. Both the oud and pipa are used primarily for cantilevered, lyrical music. The timbre of these instruments has preserved the refined aroma of the musical art of distant times.

Uzbek nagora and the Chinese bangu

The nagora is a paired percussion instrument and is made mainly of clay; occasionally, nagoras with metal or wooden bodies are found. The instrument's top is covered in calfskin and firmly attached to the body, which is woven in a lattice-like pattern that stretches across its surface and helps maintain pitch. Some instruments have a wooden or metal hoop at the bottom of the body – a bridge.

The nagora has no fixed tuning, but the sound increases slightly when the skin is heated. “This instrument is played with two thin sticks” (Belyaev, 1933: 11). The instrument is distinguished by its distinctive, resonant timbre. The nagora part is written on a single-line staff using standard notations with a fixed duration. Notes below the line are written for a low-tuned body, and above the line for a high-tuned body. The nagora is used as both a solo and accompanying instrument in various ensembles and orchestras.



Figure 17. Setting up the game on the mountain (From a personal archive of Tashmatova A.)



Figure 18. Setting up the game on the bangu (Web 4)

The Uzbek nagora and the Chinese bangu share some similarities and differences. Both instruments have skin stretched over the body. They are played with two sticks, usually sitting, and sometimes standing. The instruments differ in appearance, that is, in shape. If a steam room is made of clay together with a stand, then a single bangu is made of wood and without a stand.

The bangu is a Chinese percussion instrument. It resembles a single-sided snare drum. The instrument's body is a cup made of six pieces of hardwood glued together, creating a small hole approximately 80 mm wide in the center of the bottom. The leather is stretched over the cup and secured with nails to the body of the instrument.

The bangu is played with two special sticks. The sound varies depending on where it is struck (in the center or at the edges). During performance, the instrument is usually placed on a three- or four-legged stand. The bangu is widely used as a solo and ensemble instrument.

Conclusion

This study presents a comparative organological analysis of Uzbek and Chinese national musical instruments. The findings reveal notable parallels between instrument pairs such as nai–di, chang–yangqin, and gijak–erhu in terms of both physical structure and performance practices. In particular, instruments belonging to the same sound production categories (e.g., wind, string, percussion) demonstrate a significant degree of overlap in their structural characteristics, sound production mechanisms, and performance techniques. However, these similarities are not preserved identically across both cultures. Rather, they have diverged into distinct forms shaped by local musical traditions, aesthetic preferences, and functional needs. Differences in materials used, instrument dimensions, timbral qualities, and performance contexts stand out as the most prominent indicators of this divergence. This phenomenon provides a compelling example of how instruments with similar organological origins can evolve differently depending on their cultural context. It is possible to argue that the historical interaction between Uzbek and Chinese musical cultures—particularly through cultural exchanges along the Silk Road—played a decisive role in the development of these instruments. This process of interaction contributed not only to the emergence of technical and structural similarities from an organological perspective, but also to the expansion of the functional uses of these instruments. In conclusion, this study demonstrates that musical instruments are not merely technical objects but also tangible reflections of cultural interactions. The findings highlight the importance of cross-cultural comparative studies in the field of organology and provide a theoretical and methodological framework for future research. Further studies incorporating acoustic analyses, performance-based approaches, and larger sample groups will undoubtedly deepen the existing body of knowledge in this field.

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