The Spread and Evolution of the Pipa on the Silk Road: Instrument Form and Musical Memory in Cross-cultural Flows

Fan Lu
Northwest Normal University, Lanzhou, Gansu, China

Abstract: This study focuses on the dissemination and evolution of the pipa along the Silk Road, exploring the formation of its form, function, and cultural significance. The pipa integrates elements from Persia, India, and the Central Plains, exhibiting technical adaptation and cultural empowerment under the influence of Sogdian caravans, Buddhism, and the Japanese envoys to Tang China. The research points out that innovations in the pipa are related to Tang dynasty ritual music and political integration, with its musical functions reflecting social changes, and its symbolism embodying cross-cultural power and the politics of memory. The paper proposes a "material culture turn" paradigm, emphasizing the pipa's role as a witness to the fusion of civilizations along the Silk Road, providing historical references for intangible cultural heritage revitalization and civilizational dialogue.

***Keywords*:** Silk Road, pipa, cross-cultural communication, instrument form, cultural memory

1. Background of the study

The study of Silk Road musical instruments holds unique academic value, with its core lying in revealing their dual attributes as both "material flow" and "cultural symbols." On the material level: the transmission of musical instruments (such as the pipa and konghou) provides evidence of the cross-civilizational flow of technology, materials, and handicrafts (archaeological evidence: pipa fragments from Zhaogunluk in Xinjiang, Tang dynasty instruments from Japan's Shosoin), restoring the intermediary roles of Sogdian merchant caravans and Buddhist monks; their technical adaptations (such as improvements to the resonator box) reflect environmental adaptability. On the symbolic level: musical instruments are endowed with multiple cultural metaphors — the pipa in Dunhuang murals symbolizes Buddhist "heavenly music," the pipa in Tang and Song literature carries the identity anxieties of literati, and the pipa women in Ming and Qing export goods become Orientalist symbols. This dual interaction provides a multidimensional perspective beyond textual sources for understanding the cultural fusion of Silk Road civilizations.

The pipa is a typical representative of the Silk Road's "cultural hybridization," with its form, function, and symbolism rooted in the deep integration of Persia (oud pear-shaped resonator), India (vina curved neck), and the Central Plains (silk string craftsmanship). In its transmission, the northern route's Sogdian curved-neck pipa and the southern route's five-string pipa brought by the spread of Buddhism were integrated in Tang Dynasty Chang'an and influenced Japanese gagaku through the envoys to Tang China. This process not only reflects technological fusion (the coexistence of Persian plucking techniques and Central Plains fingerstyle) but also implies cultural contestation: the Central Plains incorporated Hu music into the ritual music system through the standardization of "four strings and twelve frets," and its leading role in the "Rainbow Skirt and Feathered Coat" piece marked its transformation from an "exotic tribute" to "cultural orthodoxy." As a "living archive" of Silk Road civilization interaction, the pipa attests to the non-unidirectional nature of cross-cultural transmission and reveals the logic of "localized empowerment" behind technological adoption.

The pipa underwent technological innovation and functional transformation during its transmission along the Silk Road. On the technical level: its form, materials, and playing techniques adapted to environmental and cultural contexts—the Persian oud's pear-shaped resonator box was modified in the Central Plains from being carved from a single piece of wood to assembled wooden panels to resist moisture and deformation; silk strings replaced gut strings, highlighting the advantages of sericulture civilization; playing style shifted from horizontal strumming to vertical plucking (evidenced by Dunhuang notation and the "Sancai Tuhui"), giving rise to indigenous techniques such as "sweeping strings" and "rolling fingers," innovating acoustic expression. On the functional level: the pipa evolved from a Sasanian court ritual instrument and a Buddhist "heavenly sound" carrier (as depicted in Dunhuang flying apsaras music scenes), integrated into Tang dynasty court music, becoming the core lead instrument in "The Song of the Rainbow Skirt and Feathered Coat"; after the Song and Yuan dynasties, it descended into the urban folk scene, accompanying various operas and dramas (such as emotional rendering in "The Romance of the Western Chamber"); during the Ming and Qing dynasties, it was solidified in literati aesthetics as the

image of a "lonely traveler at the horizon" (as in Bai Juyi's "Pipa Xing"). This reflects the instrument's adaptive transformation as a technological complex to its environment, and the hierarchical shift of its function from religious sanctity/power representation to secular artistry/emotional carrier, illustrating the symbiotic mechanism of "technological localization" and "meaning re-encoding" in cross-cultural transmission.

2. Current Research Status

Currently, domestic research on the pipa presents a "textual research - practice - reconstruction" threefold path: Zheng Ruzhong's "Study of Dunhuang Mural Music and Dance" decodes the sacred attributes of the pipa in Buddhist rituals through iconographic analysis; Zhuang Yongping's "Translation and Interpretation of Ancient Pipa Scores" relies on Dunhuang notation and corroborates with the "Songs of Baishi Daoren" to restore the Tang dynasty's pipa tuning methods and playing techniques; performers such as Wu Man promote the international transformation of the pipa through modern compositions. Recent studies have become more interdisciplinary, combining acoustic measurements to analyze the resonance mechanisms of ancient pipas or using digital humanities to reconstruct the soundscape of the Silk Road.

Foreign research, centered on Japanese scholars, has formed two main strands: Hayashi Kensan's "Study of East Asian Musical Instruments" systematically traces the cross-cultural origins of the pipa through linguistic verification and physical measurements, pointing out the etymological connections of the term "pipa" with the Persian "Barbat" and Sanskrit "Barbari," and comparing Tang dynasty instruments from Shosoin with Central Asian murals to reveal the dual transmission lineages of the four-stringed curved-neck pipa and the five-stringed straight-neck pipa. Kishibe Shigeo, in "Research on the Music History of the Western Regions," focuses on the Silk Road music network, combining Dunhuang music scores and Turpan documents to argue the "three reformations" process of the pipa's introduction from Sasanian Persia through the Kucha music department into the Central Plains, especially emphasizing the mediating role of Sogdian musicians in the transmission of techniques. These two scholars established an empirical tradition in pipa research but relatively neglected the social contextual transformation of musical functions.

3. Investigation into the Origins of the Pipa

The etymology of the term "pipa" as the name of the instrument reveals its cross-civilizational genetic roots. Linguistic research shows that the pronunciation of "pipa" is significantly related to the Persian "Barbod" and the Sanskrit "Barbat" (or "Barbari"), all beginning with the bilabial plosive sounds "b/p" and featuring alternating open and closed syllables at the end. This suggests that the term may have entered the Chinese linguistic system through Sogdian translation. It is noteworthy that in Han dynasty texts, the Chinese term "pipa" initially appeared as "枇杷" or "批把," with an onomatopoeic naming (imitating the plucking sound) that corresponds with the functional names of similar instruments in Persian and Indian contexts (such as the Sanskrit "vīṇā," which refers to the plucking action). This reflects the interconstructive logic of "instrument-sound-name" within the Silk Road context.

The tracing of the form further confirms this multicultural fusion: the Vīṇā in early Indian Buddhist reliefs (such as the carvings on the Sanchi Stupa from the 1st century BCE), although a long-necked lute-type instrument, has a gourd-shaped resonator box that shows an evolutionary connection with the pear-shaped structure of the later pipa; the Sasanian Persian silver plate (now in the British Museum) depicting the ʿūd features a short neck, curved pegbox, and horizontal playing posture, highly similar to the Western Region pipa in the Kizil Caves murals. These two lineages converged through the Silk Road and ultimately formed a composite system in the Tang dynasty, where four-stringed curved-neck and five-stringed straight-neck types coexisted. Its "neither fully Chinese nor fully Western" form characteristic is a material witness to cross-civilizational technological dialogue. William Sturrock devoted many foundational works to linking the first appearance of the pipa with historical events in West Asia. The oldest evidence he cited dates back to 2000 BCE. He attributed the pipa to mountain peoples living outside the Mesopotamian plain.[1]

The spread of the pipa was not a one-way import but exhibited a bidirectional dynamic intertwining "west-to-east" diffusion and "reverse backflow." The northern route transmission was mediated by Central Asian Sogdian merchants, relying on the overland Silk Road. In the 4th-5th century murals of the Kizil Caves in Kucha, numerous images of musicians playing horizontally held, curved-neck pipa appear, with pear-shaped resonators, four-string configurations, and triangular plectrums almost identical to the instruments depicted in the Sogdian murals of Panjikent (now in the National Museum of Tajikistan), confirming the historical fact that Sogdian musicians introduced Persian-style pipa into the Western Regions. This lineage entered the Central Plains via the Hexi Corridor and gradually adapted to the Han Chinese musical system: the pipa in the 12th cave reliefs of the Northern Wei Yungang Grottoes already shows the improvement of a bent-back neck, and Tang dynasty pottery figurines commonly adopt a vertical playing posture, completing the spatial transformation from

"barbarian style" to "Chinese charm."

The southern route backflow highlights the internal cultural feedback mechanism within East Asia. The five-stringed straight-neck pipa (a variant of the Indian Vīṇā) introduced through Buddhist exchange during the Tang dynasty underwent dual functional and aesthetic transformations on the lacquered pipa with mother-of-pearl inlay preserved in Nara's Shōsōin: although its five-string system retained Indian tradition, the decorative craftsmanship was fully sinicized — rosewood body inlaid with tortoiseshell, amber, and lapis lazuli; the soundboard painted with Tang figures playing music while riding elephants; the back mother-of-pearl patterns incorporated East Asian auspicious symbols such as Buddhist floral motifs and flying birds. More notably, Japanese musicians, to suit the requirements of gagaku music, reduced the twenty-eight frets of the Tang-introduced pipa to fourteen and adjusted the fret positions to match native scales. This "imitation-modification-re-export" pathway had a reverse influence on the standardization process of the pipa's form in the Song dynasty.

4. The Technopolitics of Form Transformation

The physical form changes of the pipa essentially reflect the cultural power struggles behind technological choices. The resonator box evolved from the pear-shaped lute structure of the Persian oud to the semi-pear-shaped composite vibration system of the Tang dynasty: Central Plains craftsmen replaced the Persian technique of carving from a single piece of wood with a wood panel assembly method, which not only solved the scarcity of rosewood but also enhanced the mid-to-low frequency resonance efficiency by adding internal sound beams (confirmed by X-ray scans of the Shōsōin pipa). This transformed the pipa from a rhythmic accompaniment instrument of the Western Regions into a melody-leading instrument of Huaxia. The customization of string numbers carries political metaphor: the Persian three-string system corresponded to the tonal tradition of the "three-tone system," while the Tang dynasty established the four-string twelve-fret standard (recorded in the Yuefu Zalu as "four strings symbolize the four seasons"), effectively incorporating Hu music into the Central Plains' "lülü system" through technical assimilation—by standardizing string numbers and bridge positions, the pipa was forced to adapt to the pentatonic scale system, completing its acoustic domestication from an "exotic curiosity" to the "orthodox sound" of Huaxia.

The transformation of playing techniques implicitly involves a contest over civilizational identity. In terms of posture struggle: the Kizil Caves murals depict Sogdian musicians holding the pipa horizontally, emphasizing finger-plucking virtuosity, whereas Zhou Fang's Tang dynasty painting "Yanle Tu" adopts a vertical holding posture, allowing the right hand to perform complex techniques such as "sweeping and brushing" on the vertical soundboard. This bodily discipline shifted performers from a "nomadic" improvisational style to a "sedentary agricultural" stylized expression. The change in playing methods carries deeper significance: Dunhuang notation shows that the Tang dynasty still primarily used plectrums ("Da Hulei" technique), while the Ming dynasty "Sancai Tuhui" established a five-finger plucking system. This shift was not only due to silk strings having weaker tension than gut strings requiring touch pressure tuning but was driven more profoundly by the literati's aesthetic preference for the "sound of metal and stone"—the finger-plucking technique, through control of string pressure, transformed the pipa's tone from the "clanking iron cavalry" to "whispered intimacies," serving the literati's lyrical tradition from the Song and Ming onward.

The replacement of pipa materials reflects the rise and fall of imperial resource control. Tang dynasty court pipas heavily used rosewood (listed as tribute in the Tang Liudian), with raw materials imported via the maritime Silk Road from the South Seas. The dense texture of rosewood brought acoustic advantages and became a political display of the "Celestial Empire's abundant resources." From the Song and Yuan dynasties onward, rosewood trade shrank due to maritime bans, and craftsmen turned to using native paulownia wood for the backboard (evidenced by Southern Song pipa artifacts unearthed in Fuzhou). Although the resonance effect was inferior, this gave rise to an aesthetic of "clear and transparent" tone, unexpectedly fitting the smaller-scale performance settings of literati gatherings. More ironically, the Japanese Shōsōin's Tang-era lacquered rosewood pipa, adorned with mother-of-pearl and tortoiseshell in the context of "Tang object worship," had its material symbolic value surpass the instrument itself, becoming a materialized carrier of power aesthetics.

5. The Multi-layered Construction of Musical Functions

The pipa initially served as a carrier of religious spiritual embodiment: during the eastward transmission of Buddhism, the flying celestial musicians holding pipa in the Dunhuang transformation murals played in midair; its pear-shaped body and flowing ribbons formed a visual symbol of "heavenly music," and its timbre was endowed with the sacred function of guiding sentient beings to the Pure Land (the Medicine Master Sutra transformation mural in Cave 220 of Mogao Caves is a typical example). After Islamization, the Central Asian pipa underwent a functional metamorphosis — the pipa retreated from Sasanian court rituals into the marketplace in the murals of the Samanid dynasty, becoming the accompaniment in-

strument for the folk narrative long poem "Maqama." The performance scenes shifted from temples to teahouses, and the musical attribute downgraded from a "divine medium" to "secular entertainment," reflecting the disciplining of instrument functions by the succession of religious powers.

The Tang dynasty's Jiao Fang system elevated the pipa to the pinnacle of ritual and music orthodoxy: the "Nishang Yuyi Song" piece featured the pipa as the lead instrument throughout (recorded in the "Yuefu Miscellany" as the "jade chime and golden pipa" ensemble), using complex finger techniques to simulate ethereal celestial music, elevating the Hu instrument to a symbol of refined Chinese elegant music. Whether in the "Nine Ensembles" or the "Ten Ensembles," "standing performers" or "seated performers," the pipa was undoubtedly a principal instrument in the court orchestras of the time. In the "Ten Ensembles," the necked pipa often appeared as the lead instrument. Within the Jiao Fang, institutions were specifically established to study instruments such as the necked pipa. It is evident that the pipa held an important position in the Sui and Tang Yan music.[2]

The 20th-century reform of the twelve-tone equal temperament promoted by Liu Dehai marked a technical compromise of the pipa in response to globalization: by adding semitone frets and expanding the range (from the traditional three sets of octaves to four sets), it enabled the instrument to perform Western tonal music (such as the concerto with orchestra "Grassland Heroic Sisters").

6. Cultural Memory

The pipa has gradually sedimented in literary writing as a complex carrier of cultural memory. Bai Juyi's "Pipa Xing" (Song of the Pipa) connects the drifting life of a "merchant's wife" with the mournful sound of the instrument, constructing the pipa as an emotional symbol of the literati class's "exile to the ends of the earth." Its auditory narrative of "each string suppressing, each sound evoking thought" became the prototype of solitude aesthetics in classical literature. By the late Qing dynasty, in "Lao Can You Ji" (The Travels of Lao Can), the "thunderous" sound of the pipa accompanying Wang Xiaoyu's storytelling was endowed with a political metaphor awakening the numb spirit of the people — Liu E used sound to allegorize the world, elevating the pipa from private melancholy to an instrument of enlightenment. This trajectory of evolution reflects both the continuous appropriation of the instrument's symbolism by the literati class and exposes the shift in the politics of sound amid the collision between tradition and modernity.

As early as 1840, "The Story of the Pipa," regarded as the "ancestor of southern opera," entered the English-speaking world in poetic form; over nearly two centuries, scholars in the English-speaking world have produced numerous translations and adaptations, including related poetry, novels, operas, and stage plays, ultimately making "The Story of the Pipa" an important part of scholarly research on Chinese opera.[3] The image of the pipa-playing woman in Ming and Qing export artworks became a field of power in cross-cultural gazes. During the European "Chinoiserie" craze, export paintings deliberately emphasized the pipa woman's bound feet, ornate clothing, and mournful expression (such as the "Pipa Lady" painting in the Victoria and Albert Museum, UK), simplifying her into a stereotypical symbol of the "delicate East" through an Orientalist lens. Paradoxically, Guangzhou's Thirteen Factories painters, to cater to Western buyers, actively adopted perspective and chiaroscuro techniques but added fictional pagodas and bamboo groves in the background, completing a symbolic production of "self-othering." This two-way misreading reduced the pipa to a material witness of cultural identity negotiation, projecting the power asymmetry of the colonial era while revealing the strategic compromise of local cultural subjectivity.

The contemporary Dunhuang pipa score interpretation project highlights the politics of memory when technology intervenes in tradition. Scholars such as Lin Qiansan and Ye Dong, based on the same P.3808 Dunhuang score, have produced completely different performance versions due to divergent interpretations of the tuning system (faithful to the Tang dynasty Yan music system vs. adapted to the modern twelve-tone equal temperament), exposing the present-day stance behind "historical restoration." What is even more noteworthy is the reconstruction of memory through digital modeling technology — the British Museum's "Virtual Dunhuang" project uses AI to generate pipa performance animations, but its timbre database includes samples from Japanese Shosoin instruments, causing the "Silk Road soundscape" to become a patchwork of transnational imagination. This "encoding-decoding" gap proves that the digital existence of cultural heritage constantly navigates the tension between academic truth-seeking and cultural empowerment.

7. Conclusion

The history of the pipa's transmission is an epic of cross-civilizational interaction; its form and functional transformations are not merely simple technological diffusion. After the Persian oud was introduced to the Central Plains, it was modified to achieve an acoustic performance transformation, with four strings and twelve frets reflecting the Tang dynasty's ritual music system's incorporation of Hu music. Cultural fusion accompanied localization and the reproduction of meaning,

which cannot be summarized by a "center-periphery" model.

The pipa provides a methodology for Silk Road studies, recording the evolution of technical genes and power relations, from a sacred ritual instrument to a secular tool, reflecting changes in social structure. The pipa transcends being a static artifact, decoding the "invisible processes" in the collision of civilizations.

The pipa case highlights the necessity of a shift towards material culture; physical objects and images form a chain of evidence revealing technological networks and cultural landscapes. Scholars should extract macro mechanisms from this to offer insights for cultural heritage preservation and provide historical annotations for the symbiosis of civilizations under the "Belt and Road" initiative.

Along the Silk Road, every sound hole of the pipa echoes the reverberations of civilizational negotiation, and every silk string is taut with the struggle of cultural power. It reminds us that true civilizational dialogue does not lie in the simple transmission of object symbols, but in the creative transformation of heterogeneous elements, giving birth to new life forms that transcend the original cultures. This may well be the most profound legacy the Silk Road has left to the contemporary world.

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