

**Creative Insights for Using Chinese Instruments
in Contemporary Western Music:
A Summary of Field Observation**

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Abstract

Through understanding the construction, design, and performance practice of Chinese instruments, the Western-trained composer can more greatly understand both the many limitations and advantages for using these ancient instruments in contemporary music. Having origins that surpass their occidental counterparts, traditional Chinese instruments were created and developed in a separate artistic world that is often misunderstood in the West. This paper evaluates both Chinese and Western instruments' technical capabilities via their design and performance application, as well as musical intent. From these examples, both the disadvantages and creative potentials are demonstrated for Chinese instruments in a modern western context. Specific issues include, flexibility of intonation, gesture, rhythm and timbre versus challenges in exactness of equal-tempered pitch, tonal harmony, and gestural/timbral stability. This research is meant to inspire future composers to understand the innovative possibilities (as opposed to restrictions) of tradition in contemporary music, as well as having the goal of bridging greater communicative knowledge between very different cultural worlds.

Keywords: Chinese instrument, composition, contemporary music, construction, Western music, orchestration

This paper explores the original intent of design in Chinese instruments and relates that to their possible usage in the context of Western contemporary music. Traditional Chinese instruments were created and developed by very different musical circumstances and philosophies than Western music and instruments. Based on a study from a Taiwan Fulbright residency in 2009, I compare and contrast the technical differences in construction between Chinese and Western instruments and conceptual differences in musical traditions and performance goals. Via my systematic observation, these examples discover the challenges and difficulties performing Western musical styles on Chinese instruments, while also demonstrating the many advantages these traditional instruments have over Western instruments in contemporary music's innovative potentials. Through understanding both the design and performance practice, the modern composer and arranger can fully appreciate and utilize both the limitations and creative possibilities of Chinese traditional instruments.

1. Methodology

My initial inspiration for this research was through working with and composing for Chinese instruments, for almost fifteen years. Beginning in 1997, I began to work with Chai Found Music Workshop, Chinese traditional instrument ensemble in Taiwan, and later with Music From China, Chinese traditional instrument ensemble in New York. Through these ensembles I was exposed to both traditional and contemporary repertoire for these instruments, and gained firsthand knowledge of both the limitations and possibilities of the *shizu* instrumentation,¹⁾ the Chinese silk and bamboo ensemble configured of *dizi* (flute), *erhu* (spike-fiddle), *pipa* (lute), *liuqin* (mandolin), *ruan* (guitar), *yangqin* (hammered dulcimer), and *zheng* (plucked zither). Through working with various other solo musicians and composers in this medium during this period, my interest led to a Senior Fulbright Research Grant to Taiwan in 2009. This study's methodology comprised of interviews including live demonstrations of all major Chinese instrument families, documented through 200 hours of high-definition audio and video. Participating musicians and conductors included members of the National Chinese Orchestra, the Taipei Chinese Orchestra, the Little Giant Chamber Orchestra, Chai Found Music Workshop and students and faculty members from National Taiwan University of Arts, Tainan National University of the Arts, Chinese Culture University and National Taiwan College of Performing Arts. The resulting information led to the concepts and conclusions drawn in this essay.

1) Sin-Yan Shen, *Chinese Music and Orchestration: A Primer on Principles and Practice* (Chicago: Chinese Music Society of North America, 2005), 22-27.

2. East vs. West

The study revealed several problems that Western-trained composers might have when writing for Chinese instruments: First, contemporary composers primarily view music through Western perspectives and values, which may be in conflict with writing for Chinese instruments. Second, contemporary composers do not understand the limitations of Chinese instruments in comparison to Western instruments. Third, contemporary composers may often miss the great possibilities of Chinese instruments, which can sometimes be even greater than Western instruments. In modern times, as most composers are schooled primarily in the Western musical traditions, the differences between music of the West and East is not easily understood as each musical tradition has different focuses, values, philosophies, and histories. This is made clearly evident through understanding instrument design and performance practice.

In Western music, the most important element is pitch. Pitch is the leading emphasis that traces the evolution of Western music history and notation and is fundamental to all Western music education and theory, where the focus is primarily upon harmony, counterpoint, motives and themes, modulation, and development. As the first sentence reads in a major theory text, “one thing that distinguishes Western art music from many other kinds of music is its preoccupation with harmony”,²⁾ this represents the West’s total manifestation of pitch. Rhythm is the next significant element in Western music, normally playing a subservient role

2) Stefan Kostka and Dorothy Payne, *Tonal Harmony with an Introduction to Twentieth-Century Music* (New York: McGraw Hill, 1989), ix.

with pitch: shaping, manipulating, and variance the given notes within a composition. Following these elements, there is emotion and gesture (dynamics, articulation, etc.) and timbre (instrumental technique, orchestration, special effects, etc.). While these other elements are certainly substantial in defining the better performers and composers by adding the “spice” bringing our music to the deepest level, Western music, throughout its history, prioritizes pitch most of all.

In Eastern music, there is an equality of elements. Timbre, gesture and nuance, feeling and sensibility (as opposed to emotion), rhythm, and pitch all play an equal role in emphasis. While pitch certainly plays a role, the focus is not on complex harmonic systems, advanced modulations, thematic transformations, etc. like in Western music, but instead on how the pitch is performed: what nuance is used, what timbre is highlighted, how is the pitch gestured, and what feeling and sensibility is created by the combination of these elements. This equality of elements was reflected in earliest notations in the *Sung* dynasty (960-1279 C.E.) used for Chinese *qin* (fig. 1), a bridge-less fingered long zither from Confucian times, that clearly indicated all the timbral, gestural, nuanced, and sensual information on how any given note was played.³⁾

The goals of Western and Eastern music are thus contrasting: In Western music the focus is on, A) *consistency of intonation*, getting the correct in-tune pitch, B) *regularity of timbre*, where all pitches should have the relatively same timbre throughout the range of the instrument, and C) a specific intent on creating *polyphony and homophony*, the realization of the pitch-based focus. In Eastern music, the focus is very

3) William M. Malm, *Music Cultures of the Pacific, the Near East, and Asia* (New Jersey: Prentice Hall, 2000).

different, emphasizing A) *variability of intonation*, meaning that pitch should not always occur at the same intonation and/or change its intonation while being played, B) *flexibility/irregularity of timbre*, having the colors of the instrument easily and constantly changeable, and C) an intent on creating *heterophony*, a system that relies on the differences in timbre and intonation to bring out each instrument in an ensemble playing a similar melody simultaneously.

The design intentions of each cultural sphere are therefore reflective of these musical foci. In the West, instruments are constructed to achieve any chromatic pitch in a wide range easily and in tune, balanced in timbre for less contrast within the instruments registers, and may be designed for ease in playing chords and counterpoint. In the East, instruments are built to allow for melodic pitches to have variance in intonation and for timbre changes to be easy to achieve and consistently change. For the purposes of comparing and contrasting the Western and Eastern instrument constructions, it is useful describe side-by-side, the design of both chordophones(zithers, lutes, fiddles) and aerophones(flutes, reeds)

3. Chordophones

(1) Zithers

The clearest example of design difference and performance practice in the East and West are between the primary zithers used as both a representative historical centerpiece and primary accompaniment

instrument. In Chinese music, this is the *guzheng*⁴⁾ (fig. 1) or *zheng* for short, a 21-string long zither that passes each string over a bridge. In the West, while not often recognized as such (since the strings are hidden and it is most often classified as a keyboard instrument), the piano is indeed the primary zither. The construction of these instruments gives great emphasis to the overall differences in musical focus between West and East.

<Fig. 1> *qin* (left) and 17-, 21-, 26-string *zheng* respectively⁵⁾



The main contrasts between the *zheng* and piano construction are quite obvious from their appearance. The strings on the *zheng* are directly in contact with the hands of the performer, with the piano, on the other hand, the performer controls a keyboard activating hammers that strike the strings. The pianist uses both hands equally to perform chords and counterpoint on the 88-key keyboard, allowing for a very large range of

4) Michael B. Bakan, *World Music Traditions and Transformations* (New York: McGraw Hill, 2007).

5) Collection of Haiqiong Deng, Tallahassee: FL. Personal photograph by author (September 2009).

chromatic pitches to be played easily at the same exact intonation every time. However, the advantage of the keyboard is also its limitation: pitches are fixed into equal-temperament, as there is no way to create vibrato or bend notes. While some timbre changes may be achieved through touch, pedaling, or harmonic density, extreme changes in timbre are only possible by going “inside the piano”, an awkward and often imprecise practice (not always allowed) that greatly hinders normal performance on the keyboard. The construction of the *zheng*, however, allows for very different performance possibilities and practice.

The *zheng*'s 21-strings are drawn over bridges set to pentatonic tunings.⁶⁾ In traditional practice, the right hand plucks the pitches, and the left hand is active on the other side of the bridges, manipulating the timbre and intonation by bending the strings to change pitch (up to a minor 3rd), add vibrato, mute the strings, create harmonics, etc.⁷⁾ The right hand also has an effect on timbre, since the performer can play either with the nails or flesh, and play a different points of each string (closer to pegs, closer to bridges, etc.) effectively creating subtle variations in color. Therefore, in comparison to the piano, the *zheng* performers hands are in direct contact with the strings, thus allowing for great changes in timbre and flexibility in intonation.

However, the *zheng*'s construction and performance also has several disadvantages for performing Western music. While the performer is not limited to the pentatonic tuning (as they can bend strings to a different pitch), playing outside of this tuning requires more effort, thus making

6) 梁廣程·潘永璋 編著,『樂器法手冊』(台北:世界文化出版社,1994),85-86.

7) Yuan-Yuan Lee and Sin-yan Shen, *Chinese Musical Instruments* (Woodridge, IL: Chinese Music Society of North America, 1999), 122.

some passages, especially those requiring distant transposition from the tuning, extremely challenging; on the other hand atonal passages may not be as difficult, since only every few notes could possibly be outside the tuning. There is an optional and a relatively common practice usage of *scordatura* tuning, however, this is limited to only the best performers (since the player must learn an entirely new pitch order to the strings.) Note that *scordatura* still limits the instrument around this new tuning and also provides the inconvenience that the instrument needs to have time to be retuned for other pieces on a concert, as it generally requires about ten minutes for the bridges to be reset and settle into position. While *scordatura* may also have the advantage to create interesting glissandi outside the normal pentatonic, it also changes the natural sound of the instrument, as the strings may no longer act as sympathetic overtones to each other.

It is also possible to play *zheng* as a chordal or contrapuntal instrument by playing pitches with both hands, a common usage in modern technique. With the advantage of making it a polyphonic instrument, there are also drawbacks: First, since the left hand is now being employed for the purposes of playing pitches, the instrument loses its flexibility of timbre and intonation that the left hand normally provides. Second, the left hand is no longer altering the pitches, thus, only notes in the tuning can be used. Third, normally nails are only worn on the right hand, creating an imbalance in timbre and dynamics between the parts in the two hands; if the player wears nails on the left hand to accommodate this, then traditional application of the left hand (on the other side of the bridges) is much more challenging and compromised.⁸⁾

(2) Lutes

Chinese plucked necked chordophones, such as the Chinese lute, *pipa* (fig. 2), the Chinese mandolin, *liuqin* (fig. 2) and the Chinese guitar, *ruan* (fig. 3.) and seem to greatly resemble their Western counterparts upon superficial glance – strings stretched over frets on a neck – but are actually quite different upon closer inspection. The primary difference between the Chinese and Western lute families is the size of the frets (fig. 4-6.) In Western lutes, the frets are barely raised from the fingerboard. This allows for each pitch to be precise in intonation and for chords to easily be played. In Chinese lutes, the frets are very high, so much that the finger does not actually touch the neck during performance. Unlike the Western design, these frets act similar to the bridges on the *zheng*, allowing for incremental shifts in intonation and timbre with every note. In the Western instruments, the performer merely touches the place where the note is fingered; on Chinese instruments, the performer has varying degrees for which they can press the pitch, since the strings are raised (and never touch) the neck. While the Western lutes need to take extra effort to alter the intonation or timbre, the Chinese instruments, are able to change the intonation and timbre more easily; however, this creates a greater challenge in maintaining the same intonation or timbre, since every a repeated note would more naturally be different every time. At the same time, without a fingerboard, except

8) Information for ‘zithers’ derived in part from personal interviews with *zheng* players Ya-Hsiu Lin and I-Hsien Lin of Chai Found Music Workshop and Haiqiong Deng, director of Chinese Ensemble and visiting professor at Florida State University and formerly of Music From China, NY (July-September 2009).

for the most basic sonorities, chords on Chinese instruments are harder to play (as the instruments were originally intended for playing monophonic music), especially with precise intonation.⁹⁾

<Fig. 2> *pipa* (top) and *liuqin* (bottom)¹⁰⁾



9) Information for ‘lutes’ derived in part from personal interviews with *pipa* player Hui-Kuan Lin, co-founder, administrative director, and vice president of Chai Found Music Workshop and *liuqin/ruan* player Si-Yi Yen of Chai Found Music Workshop and Taipei Chinese Orchestra (July-August 2009).

10) Collection of Chai Found Music Workshop, Taipei. Personal photograph by author (July 2009).

<Fig. 3> *ruan*¹¹⁾



<Fig. 4> frets on *Liuqin*¹²⁾



<Fig. 5> frets on *pipa*¹³⁾



11) Collection of National Chinese Orchestra, Taipei. Personal photograph by author (August 2009).

12) Collection of Si-Yi Yen, Taipei. Personal photograph by author (July 2009).

13) Collection of Hui-Kuan Lin, Taipei. Personal photograph by author (July 2009).

<Fig. 6> frets on guitar (front) compared to *ruan* (back)¹⁴⁾



(3) Fiddles

It is very typical for the Chinese *erhu* (fig. 7), the primary member of the *huqin* (bowed string) family to be called a “Chinese violin”. However, this misnomer tends to ignore to great differences between the *erhu* and the Western violin. A violin is a form of bowed lute, where the four strings are passed over a fingerboard; the *erhu* is a form of spike-fiddle, where the two strings are freestanding in air (and the bow is passed in between the strings). With the fingerboard design, the violinists can achieve exact pitches, even multiple-stops, simply with their fingertips. On the *erhu*, pitch is achieved purely through the tension maintained between the bow and the upper hand, which tugs the strings with “plumber’s grip. This formula for determining pitch is far more flexible in terms of intonation and color, but also much more challenging in terms of intonation, especially if expected to be in tune with other instruments in equal-temperament. The placement of the bow between

14) Collection of author, Seoul. Personal photograph by author (December 2011).

the strings also makes performing double-stops more difficult (although possible.) In terms of timbre, the violin family is perhaps the most variable of all Western instruments; however, most major timbre changes outside of *normale* (*sul ponticello*, *col legno*, *scratch-tone*, etc.) are considered “special effects” or “extended techniques” (often treated with disdain by the performer.)¹⁵⁾ On the *erhu*, since the varying tension of the string standing in midair is prone to create a multitude of changing colors, timbre change and flexibility is the norm.¹⁶⁾

<Fig. 7> *erhu*¹⁷⁾



4. Aerophones

The differences in musical intent is also demonstrated by contrasting

15) Alfred Blatter, *Instrumentation and Orchestration* (Belmont, CA: Schirmer, 1997), 37, 41-44.

16) Information for ‘fiddles’ derived in part from personal interviews with *huqin* players Cheng-Ming Huang, co-founder, artistic director and president of Chai Found Music Workshop and professor at Chinese Culture University and Chih-Sheng Chen, founder, conductor and artistic director of Little Giant Chamber Orchestra (August 2009).

17) Collection of Cheng-Ming Huang, Taipei. Personal photograph by author (August 2009).

the aerophones (wind instruments) between Western and Chinese music. Western woodwind instruments, which consist of flutes, single-reeds (clarinet and saxophone), and double-reeds (oboe and bassoon), started out with a similar design to Chinese instruments, that is, with open-holed mechanisms, have evolved to distinctly reflect the values and goals of Western music. All modern wind instruments in Western music have keyed mechanisms to allow for ease in playing all chromatic pitches with correct intonation and balanced timbre. In addition, Western woodwinds also have additional keys that extend the range to lower notes, register keys that allow for higher pitches to be played without overblowing, and trill/tremolo keys to make certain passages simple to play. Keyed mechanisms also facilitate the building of instruments in all sizes, from altissimo to contrabass range (which would be impossible on an open-holed instrument.) However, the drawback of the keyed design is that timbre is harder to contrast and intonation is harder to manipulate. For the latter, a glissando is more difficult to perform without hearing distinct pitch changes and microtonal inflections, while more precise, requires awkward fingerings.

Conversely, Chinese woodwinds retain an open-holed keyless mechanism. Major Chinese woodwinds include the *dizi* (fig. 8), a transverse fife with a sympathetic membrane, the *xiao* (fig 9), a vertical rim-blown flute, the *xun* (fig. 10), an edge-blown vessel flute, the *suona* (fig. 11), a double-reed shawm with a “trumpet-like” sound, and the *guanzi* (fig. 12), a unique instrument, related to the Armenian *duduk*, that has a cylindrical shape, uses a very large unflattened¹⁸⁾ double-reed, and

18) Yuan-Yuan Lee and Sin-yan Shen, *Chinese Musical Instruments*, 50.

has a sound reminiscent of a clarinet. Due to the open-holed fingering design, with instruments having between 5-8 finger holes, it is commonly misunderstood that these instruments are limited to pentatonic or diatonic passages; however, this is not the case. While it is certainly easier to remain within closely related key areas (a reason why Chinese wind instruments are manufactured in a variety of keys for ease in playing various transpositions), one can actually play any pitch via partial coverings of the holes. Therefore, while chromaticism and distant transposition is definitely a much greater challenge than on Western instruments, it is certainly possible, especially in the hands of an experienced player. The open-hole design does, in fact allow for much smoother and easily executed bends, with even microtones being quite natural (albeit more as an inflection than as an exact increment). Nevertheless, intonation will be much less exact, especially when employing chromaticism. It also means that blending two woodwind instruments together is much great challenge, both in intonation and in pitch. Blending the timbre of the *dizi*, is a particular problem, in that the instrument uses a sympathetic vibrating membrane, called *dimo*. Made from the inner tissue of bamboo, the *dimo*, makes the timbre of the *dizi* greatly irregular and vastly different throughout its range¹⁹)—yet this special feature allows an instrument to stand out in a heterophonic texture, the goal in traditional Chinese instrumental ensembles. Keyed mechanisms on Western instruments have made it possible for whole families of instruments in all ranges to be made-on Chinese instruments, as the open-holed mechanism not only limits the ranges of each

19) Chen-Gia Tsai, “The Chinese membrane flute (*dizi*): physics and perception of its tones,” Ph.D. Dissertation (Humboldt University of Berlin, 2003), chapters 4-6.

instrument (as there are not register nor low note extensions), but only facilitates for instruments to be designed so that the holes can be reached within the natural extension of the fingers and hand—the reason why open-holed Chinese instruments are only possible in the treble ranges (as “true” bass instruments require too much of a stretch for practical use).²⁰⁾

<Fig. 8> *dizi*²¹⁾



<Fig. 9> *xiao*²²⁾



20) Information in ‘woodwind’ derived in part from interviews with *dizi/xiao/xun* player Chung-Hsien Wu, co-founder of Chai Found Music Workshop and professor at Chinese Culture University and *suona/guanzi* player Chih-Yo Lin of the National Chinese Orchestra (May-August 2009).

21) Collection of Chung-Hsien Wu, Taipei. Personal photograph by author (August 2009).

22) Collection of Chung-Hsien Wu, Taipei. Personal photograph by author (August 2009).

<Fig. 10> *xun*²³⁾



<Fig. 11> *suona*²⁴⁾



23) Collection of Chung-Hsien Wu, Taipei. Personal photograph by author (August 2009).

24) Collection of Chinese National Orchestra, Taipei. Personal photograph by author (July 2009).

<Fig. 12> guanzi²⁵⁾

5. Creative Insights and Summary

When using Chinese instruments in a contemporary Western context, composers and arrangers should consider the vastly different construction and performance practices, as they have many limitations as well as some advantages, as compared to their Western counterparts. In terms of pitch, Western instruments are designed to fall within a set intonation with little flexibility; Chinese instruments, on the other hand, are designed to consistently vary their intonation of every pitch. The first concern is chromaticism on Chinese instruments. Chromaticism is indeed possible, and is not necessary to avoid, but is more challenging to implement than on Western instruments. First, faster passages involving chromaticism, depending on context, may require a professional experienced player. Slower passages are more approachable, but note that the intonation of these pitches may be less reliable (as it requires a more “extended technique”, i.e. bending strings, half-holing, etc.). Modality, of course, can work very well, assuming it is applied to a closely related mode to the instruments home tuning; however, modulations within modality may be constricted due to this factor. common-practice tonality, in fact, can

25) Collection of Chih-Yo Lin, Taipei. Personal photograph by author (August 2009).

sound awkward, even humorous, as its hierarchy of voice leading implication requires a certain precise intonation that the instrument is not designed nor a context the performer typically utilizes. Atonality is surprising more adaptable in context, although it requires an experienced player. Microtones may also be used more readily than on a Western instrument, but only in a general, not precise way. Timbre based styles of contemporary music, in fact, work very well, as they utilize capabilities that are very natural to Chinese instruments: what is an “extended technique” (such as a manipulation of timbre or pitch) on a Western instrument, instead is a normal extension of Chinese instrument performance. However, due to the inherent variability of timbre and intonation on Chinese instruments, blend is less unified, often difficult to achieve. In terms of rhythm, various “groove” based metrics, even those outside the Chinese musical tradition are easily adapted, since Chinese music itself often employs a related cyclic rhythmic sensibility.

For Western-trained composers to successfully use Chinese instruments, it is best to first know the differences with their Western counterparts, both in design and performance practice. The most important creative insight is to not expect Chinese instruments to sound nor function like a Western instrument. Instead, within understanding their limitations and utilizing their natural flexibility in intonation, timbre, gesture, and nuance, composers and arrangers can effectively continue to explore the possibilities of Chinese instruments in Western contemporary music.

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개 요

서양 현대 음악에서 중국 악기 사용을 위한 창조적 이해

마이클 시드니 팀슨

서양음악을 훈련받은 작곡가는 중국 악기의 구조와 디자인, 그리고 연주 관습을 이해함으로써 이러한 옛 악기들을 현대음악에 사용할 때의 여러 이점과 함께 한계점을 두루 알 수 있게 된다. 그 기원에 있어서 양의 전통 악기들보다 오래된 중국의 전통 악기들은 서양에서 종종 오해하고 있는 독립적인 예술세계에서 창조되고 발전되었다. 이 논문은 중국과 서양의 악기들이 갖는 기술적 능력을 평가함에 있어서 음악적 의도만이 아니라 악기의 디자인과 연주에 대한 적용 가능성을 함께 살필 것이다. 관련된 여러 사례들을 통해 서양 현대 음악의 맥락에서 중국 악기들을 사용할 때 부딪치게 되는 난점과 창조적 가능성을 동시에 제시하겠다. 여기서 다음과 같은 몇 가지 쟁점들이 다루어질 것이다. 그것은 조율과 제스처, 리듬과 음색의 유연성과 이에 대응하는 평균음 음고의 정확성, 조성적 화성, 그리고 제스처/음색의 안정성을 통한 도전이다. 이 연구는 미래의 작곡가들로 하여금 현대 음악에서 전통 음악의 혁신적 가능성(여러 한계들과 반대되는 것으로서)을 이해할 수 있도록 아이디어를 제시해주기 위해 씌어졌다. 또한 서로 다른 문화적 세계 사이에 좀 더 큰 상호이해의 다리를 놓아줄 것을 의도하고 있다.

주제어: 중국 악기, 작곡, 현대음악, 구성, 서양음악, 관현악법

투고일	심사일	게재 확정일
2011년 10월 27일	2011년 11월 5일~23일	2011년 12월 1일