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Addressing Cipher Notation Issues in Guzheng Music: A Practice-Led Study of Manqin Zhao's Notational Method

Qiongzi Zheng[1], DMA; Neal Peres Da Costa[1], PhD; and Lewis Cornwell[1]

[1]Department of Historical Performance, Sydney Conservatorium of Music, the University of Sydney, 1 Conservatorium Rd, Sydney, NSW 2000, Australia.

ORCID iD:

https://orcid.org/0000-0002-0893-3089 (Qiongzi Zheng)

Address for Correspondence:

Dr. Qiongzi Zheng, Department of Historical Performance, Sydney Conservatorium of Music, the University of Sydney, 1 Conservatorium Rd, Sydney, NSW 2000, Australia (pearlmoon_2001@hotmail.com, 61 414 619 696).

Abstract   Accurate music notation is essential to the transmission and preservation of Chinese guzheng music. However, the existing cipher notation method is limited in adequately capturing important nuances and ornamentations of a guzheng music piece. This study examined some of the issues of cipher notation in guzheng music by comparing the music scores in the existing cipher notation method with that in Manqin Zhao's notational method in Henan regional guzheng repertoire. The study aimed to identify what key musical elements have been lost in the representation of bending using the existing cipher notation method and explore how Manqin Zhao's notational method addressed the issues. The study highlighted the need for further standardization and improvement of the existing cipher notation system

Keywords   Guzheng, Chinese Guzheng Music, Cipher Notation, Cipher Notational Issues, Manqin Zhao's Notational Method

1. Introduction

Chinese traditional music and folk genres were passed down from generation to generation largely through oral transmission (Mingyue, 1985)or *kouchuanxinshou* as known in Chinese, which is literally translated as "orally transmitted teaching by heart". Whilst early generations of *guzheng* (a Chinese plucked zither) folk musicians used *gongche*notation consisting of simple Chinese characters with each representing a pitch position together with basic metric signs as a guide, most of the time, they learned orally and aurally from each other's daily practice and played impromptu. It was not until the 1950s when *guzheng* music teaching started to be institutionalized from folk practice and the cipher notation system was formally used (Li, 2003). When folk musicians first set up their *guzheng* music teaching, a repertoire of folk ensemble was their initial teaching material (Sun, 2015). They had to modify and adapt these tunes to make them suitable for guzheng solo (Hu, 2022). At that time, folk musicians could only read *gongche*notation and relied on the assistance by their conservatory students for transcription of *gongche* notation into cipher notation (Wang, 2007).

Early version cipher scores compiled during this period were very simple, providing only a skeletal structure of main musical pitches and basic metrical indications (Gaywood, 1996). The transcription of *gongche*notation into cipher notation, however, faced significant challenges as *gongche*notation used Chinese characters to represent pitch height, whereas cipher notation utilized numerical codes. It required a systematic mapping and conversion of Chinese characters into numerical codes, which was not always straightforward and subject to individual folk masters' oral transmission teaching methods (Kwok, 1987).Despite subsequent standardization and modification, cipher notation today still relies heavily on oral transmission (Wei, 2005) as a means of conveying the execution of left-hand ornamentation when it comes to pitch height and time value in bending. This makes it difficult for the student to accurately play from the scores (Zhao, 2000a). Furthermore, it is also hard to account for differences in each teacher's understanding of nuances and subtleties of the piece. As *guzheng* Master Manqin Zhao pointed out (personal communication with Manqin Zhao):

"The existing cipher notation method relies heavily on oral transmission as a means of conveying un-notated elements on the score. In the process of oral transmission, there existed significant variations in stylistic interpretation even amongst the masters in the same chain of transmission. This is due to the fact that in existing cipher notation, pitch bending is represented using notational symbols. These symbols fall short of indicating the magnitude of pitch changes. Take upward portamento on scale degree 3 as an example, the actual effect could be scale degree 3 bending to the pitch height of scale degree 4, or scale degree 3 bending to the pitch height of sharpened 4thscale degree, or scale degree 3 bending to the pitch height of scale degree 5."

Manqin Zhao is a world-renowned *guzheng* performer, composer and educator. The fast fingering techniques developed by Manqin Zhao in the 1970s have transformed the way modern *guzheng* is played. He has left an indelible mark on the advancement of *guzheng* playing techniques and notational system.

This study examined the issues of cipher notation by comparing the music scores compiled by Henan regional *guzheng* folk musician Cao Donfu and Wang Xunzhi using the existing cipher notation method with the music scores by Manqin Zhao using his notational method in Henan regional *guzheng* repertoire. The study aimed to identify what key musical elements have been lost in the representation of bending using the existing cipher notation method and explore how Manqin Zhao's notational method addressed the issues, which is critically important to the articulation of expressiveness and accurate rendition of traditional *guzheng* music.

2. Notational Issues of Cipher Scores

2.1 Notation for *shanghuayin* (upward portamento)

In *guzheng* cipher scores, pitch bending such as upward portamento and downward portamento are represented using notational symbols*.* In the case of upward portamento, the symbol (Figure 1) is placed at the top right corner of the main note performing the pitch bending. It is important to note that, due to the pentatonic tuning of the *guzheng*, *fa* (scale degree 4) and *si*(scale degree 7) can only be produced by bending downward on *mi* (scale degree 3) string and *la* (scale degree 6) string.

Under the existing notation method, the magnitude of the pitch change is not indicated. As it is up to individual folk musicians to interpret at their discretion, there often exists significant inconsistency in pitch height across different

recordings. Manqin Zhao categorised the patterns of bending into the following three types (Zhao, 2000a). Take upward portamento on scale degree 3 for example, the actual effect could be scale degree 3 bending to the pitch height of scale degree 4, or scale degree 3 bending to the pitch height of sharpened 4thscale degree, or scale degree 3 bending to the pitch height of scale degree 5 (refer to Figure 1). Likewise, the time value of the pitch bending is not reflected. The time value of the pitch bending could be a two-eighths note, or a sixteenth note followed by a dotted eighth note, or a dotted eighth note followed by a sixteenth note or other rhythmic subdivisions.

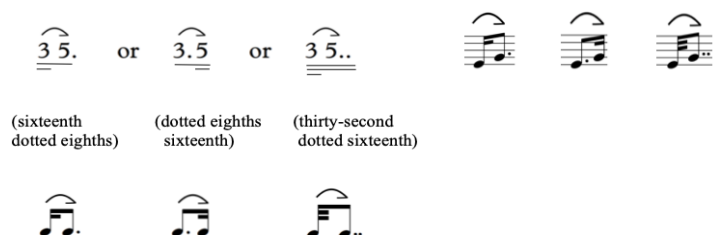**Upward Portamento on Scale Degree 3**
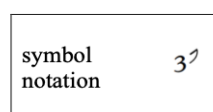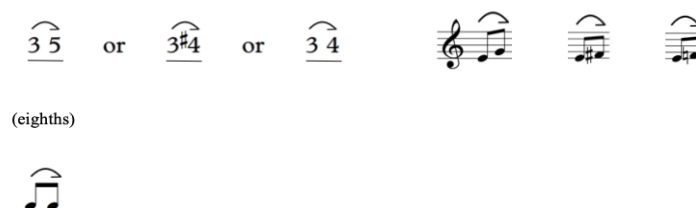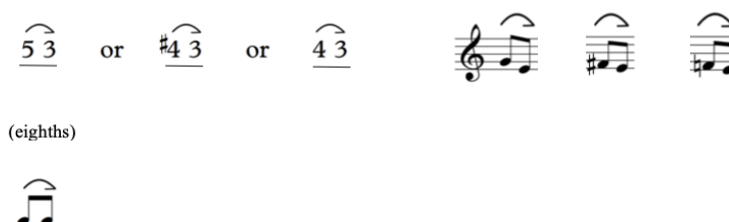

Figure 1. Upward portamento

2.2 Notation for *xiahua yin* (downward portamento)

In the case of downward portamento, the symbol is placed at the top left corner of the main note performing the pitch bending (Figure 2). The left hand presses down on the main note to the desired pitch height first before initiating the right-hand plucking and gradually releasing tension on the string after plucking to bring it back to the main note. Again, the magnitude of releasing the tension on the bending is not indicated. The time value and speed of left-hand release are not reflected. As it is often left for individual folk musicians to interpret at their discretion, there exists significant inconsistency in pitch height across different recordings. Manqin Zhao categorised the patterns of bending into the following three types (Zhao, 2000b). Take downward portamento on scale degree 3 for example, the actual effect could be scale degree 5 released to the pitch height of scale degree 3, or scale degree 4 released to the pitch height of scale degree 3, or scale degree sharped 4th released to the pitch height of scale degree 3 (refer to Figure 2). Similarly, the time value of the pitch bending is not reflected. The time value of the pitch bending could be a two-eighths note, or a sixteenth note followed by a dotted eighth note, or a dotted eighth note followed by a sixteenth note or other rhythmic subdivisions.
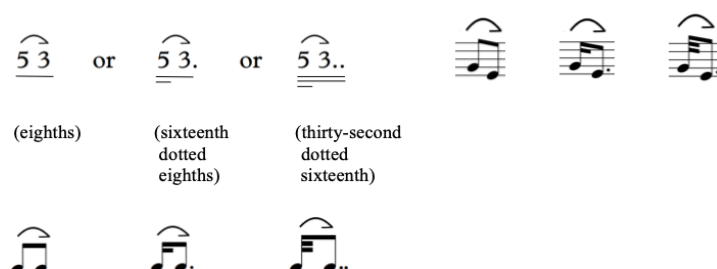
Downward Portamento on Scale Degree 3
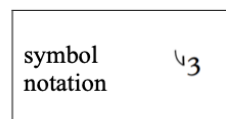
Figure 2. Downward portamento

2.3 Notation for *dianyin* (fast portamento)

Similar to portamento, fast portamento is also a form of ornamentation. In *guzheng* cipher scores, the notational symbol used to indicate fast portamento can be a small downward-pointing arrow or a small upside-down triangle placed above a note. Fast portamento, however, has a slightly different musical effect to portamento. It has an appoggiatura effect, but often in *guzheng,* the note value is not equalized between the ornamental note and the main note (refer to Figure 3). The symbol does not indicate pitch height, or time value or frequency of bending. Furthermore, it does not capture whether the bending occurs before plucking or during plucking. As it is left for individual folk musicians to interpret at their discretion, there exists significant inconsistency in pitch height across different recordings. Manqin Zhao categorised the patterns of bending into the following three types (Zhao, 2000b) (Figure 3). Type 1 fast portamentooccurs when the right hand plucks first and is immediately followed by the left-hand bending. Type 2 fast portamentooccurs when the right hand plucks and the left-hand bending occurs at the same time. Type 3 fast portamento occurs when the right hand plucks once followed by multiple consecutive left-hand bending. Without clear differentiation in notation, it is very difficult to differentiate the execution of fast portamento from portamento which has much less time value.

Type 1 – Dianyin

Actual effect could be:

(eighths with
semiquaver
appoggiatura)

Time value could be:

(eighths with   (eighths with
semiquaver   demisemiquaver
appoggiatura)   appoggiatura)
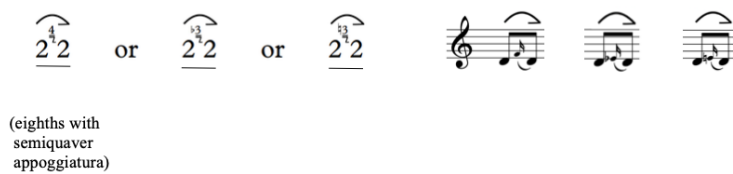
Figure 3 - Type 1 *dianyin*

Type 2 – Dianyin

Actual effect could be:

(crotchet with
appoggiatura)

Time value could be:

(minim with   (minim with
semiquaver   demisemiquaver
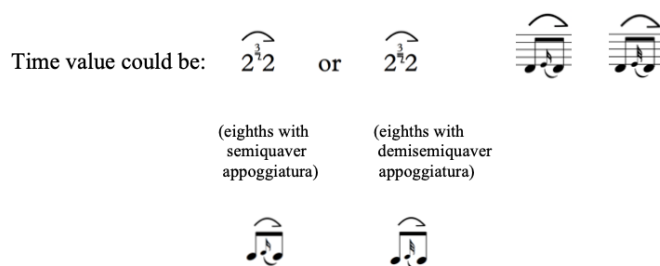appoggiatura)   appoggiatura)
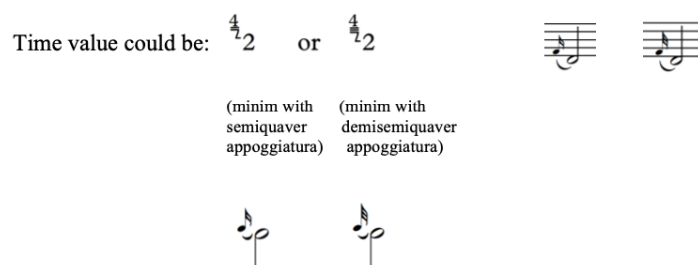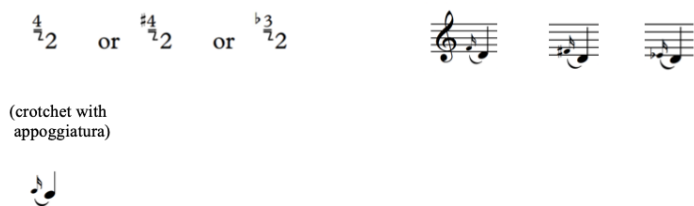
Figure 3 - Type 2 *dianyin*

Type 3 – Dianyin

Actual effect could be:

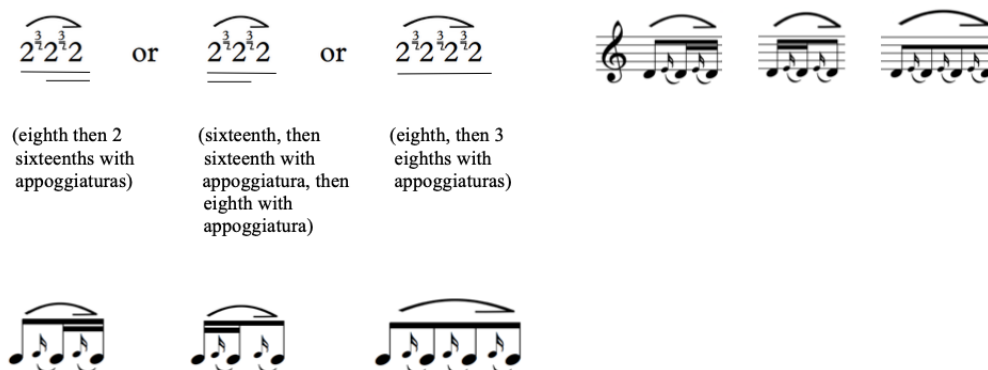| (eighth then 2 sixteenths with appoggiaturas) | (sixteenth, then sixteenth with appoggiatura, then eighth with appoggiatura) | (eighth, then 3 eighths with appoggiaturas) |

Time value could be (As Above)

Figure 3 - Type 3 *dianyin*

3. Comparing Manqin Zhao's Cipher Notational Method with the Existing Cipher Notational Method

This section compared Manqin Zhao's cipher score notational method with the existing cipher notational method using Henan regional *guzheng* repertoire as an example. Four pieces representative of Henan regional *guzheng* school were used for the comparison: *Hefan*(Making Peace)*, Luoyuan*(the Courtyard in Ruins),*SuwuSixiang* (Suwu Nostalgic for Hometown) and *Hanjiang Yun* (the Charm of the Han River). The four pieces were transcribed in three versions using Sibelius software: Version 1 (labelled 1) in Manqin Zhao's cipher score notation method; version 2 (labelled 2) and version 3 (labelled 3) in the existing cipher score notation method by Cao Dongfu and Wang Xinwu respectively (Fan, 2019). A vertical note-by-note examination of the three score versions was performed to show their differences in pitch height and time value. The three score versions were named by scale degree as the pitch height in these scores involved microtonal variations in addition to sharps and flats. In Manqin Zhao's version, small arrows pointing up or down were also added to the left side of certain notes. As Manqin Zhao explained, these arrows were used to indicate microtonal variations (personal communication with Manqin Zhao):

"The arrow pointing up indicates raising the note by approximately 20 cents and the arrow pointing down indicates lowering the note by approximately 20 cents. On equal temperament terms, if each semi-tone approximates to 100 cents, then one arrow approximates to 20 cents. All bending should reflect the microtonal changes."
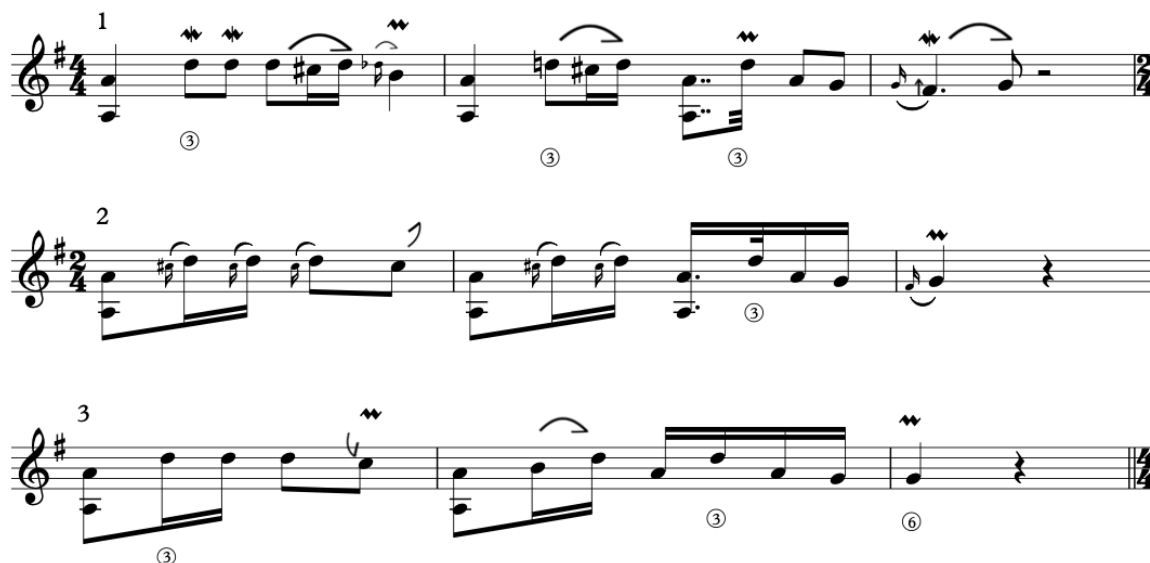
Figure 4*. Hefan*(Making Peace)(bars 1-3)

The three versions (Figure 4 above) reflect different bending patterns. In bar 1 of version 1 (Manqin Zhao's version), scale degree 5 is achieved by a quick and sudden bend on scale degree 3, raising it by a minor second to produce the pitch height of scale degree 5 before plucking. This is in contrast to bar 1 of version 2, where scale degree 3 is first bent to the pitch height of scale degree 4# and bent further to reach the pitch height of scale degree 5. Although version 1 and 3 are very similar, in bar 1 of version 3, scale degree 5 is not played with a heavy vibrato.

The time value of the pitch bending is notated differently in the three versions. For instance, in version 2, the second half of the first beat is a typical Type 2 fast portamentowheretheright-hand pluck and the left-hand bending occur at almost the same time*.* From scale degree 4# to scale degree 5, it has an appoggiatura effect, as more note value is given to the main note (scale degree 5) and less note value given to the ornament note (scale degree 4#).

Careful comparison of the fourth beat of bar 1 across the three versions indicates that the bending begins on different note. Version 1 begins on scale degree 5, meaning the left hand has to first press down on scale degree 3 to the pitch height of scale degree 5, before releasing it back to scale degree 3. In the process of gradually releasing tension on the string, vibrato is also added. In terms of speed, the main note (scale degree 3) takes up more note value (almost double) than the ornament note (scale degree 5). Version 2 begins on scale degree 4, meaning the bending is done by pressing down on scale degree 3 first to the pitch height of scale degree 4 before releasing it back to scale degree 3. In terms of speed, the main note (scale degree 3) takes up less time value than the ornament note (scale degree 4), hence aurally the accentuation would be on the ornament note (scale degree 4). Version 3 does not show the starting point of bending, meaning it is completely left to the discretion of the teacher or the student. Whilst it can be argued that this gives greater freedom in expressiveness, from the perspective of inheritance, slight difference in the teacher's understanding of pitch height can lead to marked difference in oral transmission outcome and musical effect.

Bar 3 indicates even greater pitch height and time value differences among the three versions. Version 1 creates an effect of fast downward portamento followed by upward portamento. It is produced by bending down on scale degree 6 and raising it by a minor third to the pitch height of scale degree 1, then quickly released back up to the pitch height of scale degree 7 and then upward portamento again to scale degree 1. Version 2 creates an effect of upward portamento. It is produced by bending down on scale degree 6, raising it by a minor second to the pitch height of scale degree 7 and bending further to reach the pitch height of scale degree 1. By contrast, version 3 indicates a very fast portamento effect where one barely hears the minor third upward bending.

Figure 5. *Hefan* (Making Peace) (bars 23-24)

As shown in Figure 5, score comparison reveals no significant difference in bar 23 of both versions. The major difference occurs in the bending pattern of bar 24. In version 1, the starting note is on scale degree 1 and this pitch height is achieved by a fast upward portamento on scale degree 7, raising it by a minor second to the pitch height of scale degree 1. In version 2, however, the starting note is also on scale degree 1, but it is achieved by a fast and abrupt bending of scale degree 6, raising it by a minor second to the pitch height of scale degree 1. The gradation of pitch changes becomes prominent in bar 24. Version 1 indicates consecutive downward portamento from flattened 7th (by approximately 20 cents) scale degree to flattened 7th (by a semitone), then to sharpened 6th (by approximately 20 cents) scale degree, and then to natural 6th scale degree, ending with an upward portamento to scale degree 1. By comparison, version 2 reveals fewer gradations of pitch changes with simply a repeated plucking of scale degree 7 and ends with an upward portamento to scale degree 6.
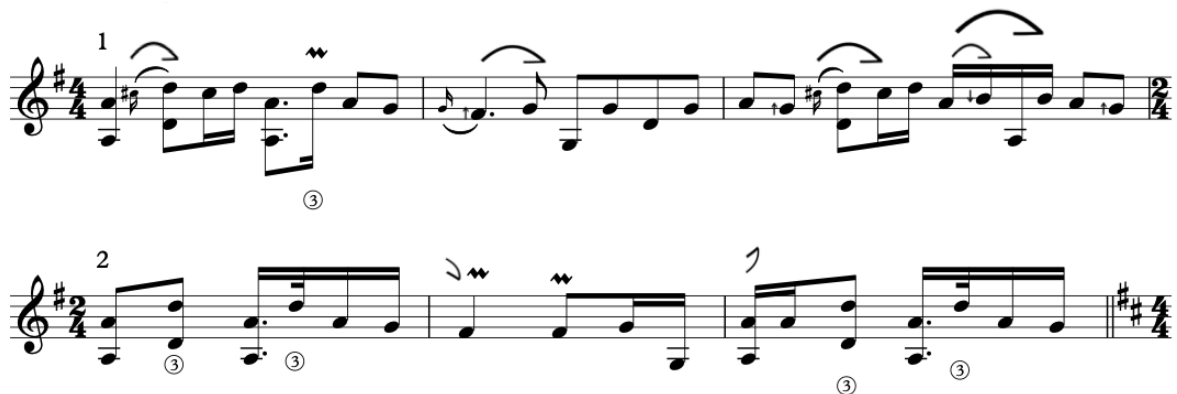
Figure 6. *Luoyuan*(the Courtyard in Ruins) (bar 1-3)

One of the most significant differences between the two versions occurs in bar 3 (Figure 6). Version 1 typically employs aType 3 fast portamentowhere the right hand plucks once, which is followed immediately by multiple consecutive left-hand bending from scale degree 2 to scale degree 3. Version 2, however, replaces this musical effect with a dotted rhythm. Rhythmically the two versions sound different, and more importantly, the requirement of the left-hand bending motion in achieving the desired musical effect is very different. Without clear differentiation, it is very difficult to know the speed at which the portamento should be executed.

Figure 7. *Suwusixiang* (Suwu Nostalgic for Hometown) (bar 15-17)

Bar 15-17 of the *guzheng*piece*SuwuSixiang* (Suwu Nostalgic for Hometown) (Figure 7) reveals not only significant differences in pitch height but also in rhythm. In terms of pitch height, just as in the earlier examples, the bending patterns in both versions show noticeable differences. Version 1 of bar 15 ends with an upward portamento from scale degree 6 to scale degree 1. Version 2, however, ends on scale degree 6. Version 1 of bar 16 ends with a fast portamentofrom scale degree 7to scale degree 1. This is a typical Type 2 fast portamentowhere the right-hand pluck and the left-hand bending occur almost at the same time, creating an appoggiatura effect, but more time value is distributed to the main note (scale degree 1). Bar 17 in Figure 7 reveals significant rhythmical difference between the two versions. Straight after the downward portamento from scale degree 6 to 1, version 1 includes a semi-quaver rest followed by a dotted thirty-second note, whereas version 2 only includes a dotted thirty-second note. Aurally, the rhythmical treatment in version 1 would create a more edged and angular musical effect.

Figure 8. *Hanjiang Yun* (the Charm of the Han River) bar 1-4

Whilst in both versions (Figure 8), the first beat of the first bar creates an upward portamento effect, the starting point is different. Version 1 begins on scale degree 7, whereas version 2 begins on scale degree 6. Also in version 1, scale degree 5 is achieved by a fast and short bend on scale degree 3, raising it by a minor second to produce the pitch height of scale degree 5. This is in contrast to version 2 which is simply an open string pluck of scale degree 5. Bar 3 of version 1 captures four microtonal variations (notated with an arrow pointing downward) on scale degree 1 and scale degree 7, revealing subtle pitch changes during the melodic descent. In contrast, bar 3 of version 2 is a constant repetitive plucking with no pitch changes.

4. Conclusion

Accurate music notation is essential to preserving the authenticity of traditional Chinese *guzheng* music. It not only provides clarity in the interpretation of a *guzheng* music piece and enables *guzheng* musicians to understand the nuances and subtleties of the piece, but also ensures consistency in its performance. Accurate representation of pitch height and note duration ensures that the music can be played as intended. As analysed in this study, the existing cipher notation of traditional *guzheng* music is limited in accurately capturing important expressive musical elements such as pitch height and time value when bending and microtonal variations. Manqin Zhao's notational method addressed the issues by replacing the notational symbols for upward portamento, downward portamento and fast portamento with precise indications of time value and pitch height.

In terms of rhythm, it denotes the time value of each portamento, providing a more accurate indication of when and where bending should take place within a musical bar. In terms of pitch height, it specifies the precise pitch value of bending, thus reducing variations in left-hand bending. His method allows *guzheng* musicians to effectively execute bending techniques and preserve important expressive elements of folk masters' style and *guzheng* music traditions. It also contributes to the efficiency in *guzheng* music teaching and learning and minimization of reliance on oral transmission and its inherent errors and inconsistencies associated. The issues of the existing cipher notation method highlight the need for further improvement and standardization of the existing cipher notation system, which is vitally important to the transmission and preservation of Chinese *guzheng* music traditions.

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References

Fan, Y. F. (2019). *Guzheng Examination Repertoire*. Shannxi People's Press.

Gaywood, H. R. A. (1996). *Guqin and Guzheng: The Historical and Contemporary Development of Two Chinese Musical Instruments* Durham University].

Hu, X. (2022). *Guzheng Music culture in Henan Province, China*Mahasarakham University.

Kwok, T. J. (1987). *Zheng: A Chinese Zither and its Music* University of Hawai'i]. Manoa.

Li, X. (2003). New Understanding of Traditional Music, Inheritance, Transformation. *Renmin Yinyue Publishing*, 28.

Mingyue, L. (1985). Performance practice as a recreative process in Chinese Zheng Zither music. *The World of Music, 27*(1), 48-67.

Sun, Z. (2015). *The Chinese Zheng Zither: Contemporary Transformations*. Ashgate.

Wang, Y. R. (2007). *Twenty-first Century Zheng Art* Beijing.

Wei, J. (2005). The application, standardization and unification of guzheng fingering techniques and symbol notation. *Ningxia University Journal 27*, 120-125.

Zhao, M. Q. (2000a). *Notational System and Practical Application to Teaching*. International Cultural Press.

Zhao, M. Q. (2000b). *Notational System and Practical Application to Teaching*. International Cultural Publishing.

Authors Biography

Dr Qiongzi Zheng

Dr Qiongzi Zheng is a performer and scholar. She received her Master of Music Performance and Doctor of Musical Arts degrees from the Sydney Conservatorium of Music, the University of Sydney. She currently teaches guzheng at the Historcal Performance Department, the Sydney Conservatorium of Music.

She is the recipient of multiple academic excellence awards from the University of Sydney, including the Margaret Henderson Scholarship Award (2016), the Albert Scholarship Award (2017), the Vice Chancellor Global Mobility Award (2018), the University Postgraduate Award (2019–2023), and the Isabelle Paulette Career Development Award (2024). In 2023, she won the Best Presentation Award at the XVII International Conference on Creative and Performing Arts in Rome, Italy.

Under the direct tutelage of Zhao Manqin, a world-renowned guzheng master, composer and educator, she has distinguished herself as a guzheng virtuoso. She has performed at numerous music events in Australia, including solo performances at Government House, chamber concerts, and various cultural and music festivals.

Lewis Cornwell

Lewis Cornwell is an experienced theory teacher and composer with research interests in the area of 20th century Japanese composers. A graduate of the University of Sydney, he studied composition in the Department of Music with Peter Sculthorpe. He began tutoring in harmony in 1982, both in the Music Department and at the Sydney Conservatorium of Music, gaining a full-time position at the Conservatorium in 1989, where he served as chair of musicology from 2002-2004 and 2006-2010, and associate dean (ICT/eLearning) from 2004-2006.

Neal Peres Da Costa

Professor Neal Peres Da Costa is a world-renowned performing scholar, researcher and educator. He has held academic posts at the University of NSW, University of Leeds, Trinity College of Music (London), and Royal Academy of Music (London). He is Professor of Historical Performance at the Sydney Conservatorium of Music where he founded the Historical Performance division in 2007, and was the division's chair for eight years. Subsequently, he was Program Leader of Postgraduate Research. Currently, he is Associate Dean (Research).