Melodic transformation processes in the arrangements of jingju *banshi*

Rafael Caro Repetto, Xavier Serra
Music Technology Group, Universitat Pompeu Fabra, Barcelona
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2. Methodology
3. Results and discussion
   1. yuanban
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1. Introduction: music in jingju

【西皮原板】
当日里好风光忽觉转变，

声腔  shengqiang  
melodic framework

西皮  xipi

板式  banshi
metrical pattern

原板  yuanban

行当  role-type

旦  dan

Tonal categories
Dramatic content and context
Character building
Singing school
Artist's personal interpretation

tempo: mid
bpm: 60 - 80

1 = E
bpm: 76

1 = E4  
(329.13 Hz)
1. Introduction: music in jingju

声腔 *shengqiang*  
melodic framework

西皮 *xipi*  
反西皮 *fanxipi*  
南梆子 *nanbangzi*

二黄 *erhuang*  
反二黄 *fan'erhuang*  
四平调 *sipingdiao*  
高拨子 *gaobazi*

板式 *banshi*  
metrical patterns

<table>
<thead>
<tr>
<th>Metred</th>
<th>Non-metred</th>
</tr>
</thead>
<tbody>
<tr>
<td>慢板 <em>manban</em> 4/4</td>
<td>1/4</td>
</tr>
<tr>
<td><strong>原板 <em>yuanban</em></strong> 2/4</td>
<td><strong>散板 <em>sanban</em></strong> <strong>medium</strong>*</td>
</tr>
<tr>
<td>二六 <em>erliu</em> 2/4</td>
<td><strong>快板 <em>kuaiban</em></strong> <strong>very fast</strong>*</td>
</tr>
<tr>
<td>流水 <em>liushui</em> 1/4</td>
<td><strong>摇板 <em>yaoban</em></strong> <strong>fast</strong>*</td>
</tr>
</tbody>
</table>

行当 *role-types*

<table>
<thead>
<tr>
<th>Male style</th>
<th>Female style</th>
</tr>
</thead>
<tbody>
<tr>
<td>老生 <em>laosheng</em> adult male</td>
<td>旦 <em>dan</em> young and adult female</td>
</tr>
<tr>
<td>净 <em>jing</em> painted-face male</td>
<td>四旦 <em>siadan</em> young male</td>
</tr>
<tr>
<td>老旦 <em>laodan</em> old female</td>
<td>小生 <em>xiaosheng</em> young male</td>
</tr>
</tbody>
</table>

西皮 *xipi*  
反西皮 *fanxipi*  
南梆子 *nanbangzi*  
二黄 *erhuang*  
反二黄 *fan'erhuang*  
四平调 *sipingdiao*  
高拨子 *gaobazi*
【西皮慢板】
谯楼上二更鼓声声送听,
父子们去采药未见回程。
对孤灯思远道心神不定,
不知他在荒山何处安身。

【原板】
到三更真是月明人静,
猛听得窗儿外似有人行。 
忙移步隔花荫留神听定, 
原来是秋风起扫叶之声。 
听画鼓报四更愈添凄冷, 
看娇儿正酣睡恐被风侵。 
我不免引寒机【二六】伴奴坐等, 
又思来又想去越不安宁。 
数更筹交五鼓空房愈冷, 
果然是晓鸡唱天已黎明。 
我不免唤琏儿到街前探问, 
【摇板】
你爹爹到如今未转家门。 

"谯楼上二更鼓声声送听"
《荒山泪》 (张慧珠) 
"Qiao lou shang ergenggu shengsheng song ting", 
Huangshan lei (Zhang Huizhu) 
"The drum tower is sounding the second night watch", Tears from Barren Hill (Zhang Huizhu)
1. Introduction: music in jingju

manban

\[
\begin{array}{c}
\text{\textcopyright{\textregistered} = 35} \\
\end{array}
\]

yuanban

\[
\begin{array}{c}
\text{\textcopyright{\textregistered} = 76} \\
\end{array}
\]

kuai ban

\[
\begin{array}{c}
\text{\textcopyright{\textregistered} = 149} \\
\end{array}
\]
1. Introduction: music in jingju

manban

\[ \text{\textcopyright 2010 Jiang Huoding} \]

yuanban

\[ \text{\textcopyright 2010 Jiang Huoding} \]

kuai ban

\[ \text{\textcopyright 2010 Jiang Huoding} \]
1. Introduction: music in jingju

manban

\[ s = 35 \]

\[
\begin{array}{c}
\text{西施女生长在苎萝村里}
\end{array}
\]

《西施》(《西施》)

“I am Xi Shi, from Zhuluo village”, Xi Shi (Xi Shi)


yuanban

\[ s = 76 \]

\[
\begin{array}{c}
\text{当日里好风光忽然}
\end{array}
\]

《李胜素梅派唱腔专辑》(Mei school arias by Li Shengsu), Zhongguo luyin luxiang chuban zongshe

Li Shengsu 李胜素

kuaioban

\[ s = 149 \]

\[
\begin{array}{c}
\text{提起了男人我不晓}
\end{array}
\]
1. Introduction: Music in Jingju

**manban**

```
\[ \text{音符} \]
```

**yuanban**

```
\[ \text{音符} \]
```

**kuaiban**

```
\[ \text{音符} \]
```

---

“苏龙魏虎为媒证”
《武家坡》（薛平贵，王宝钏）
“Su Long Wei Hu wei mei zheng”, *Wujia po* (Xue Pinggui, Wang Baochuan)
“Su Long and Wei Hu act as matchmakers”, *The Wujia Hill* (Xue Pinggui, Wang Baochuan)


Li Shengsu 李胜素

Yu Kuizhi 于魁智, *Yu Kuizhi laosheng changqiang zhuanji* 《于魁智老生唱腔专辑》 (*Laosheng* arias by Yu Kuizhi). Zhongguo luyin luxiang chuban zongshe
1. Introduction: music in jingju

maniBan

\[ \text{\textit{manban}} \]

\[ \text{\textit{yuanban}} \]

\[ \text{\textit{kuaiban}} \]
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4. Conclusions
http://compmusic.upf.edu/

- Goal: “to advance in the automatic description of music by emphasizing cultural specificity”
- Main research field: Music Information Retrieval
- Research object: Carnatic music, Hindustani music, Turkish-makam music, Arab-Andalusian music, jingju music
- Jingju music corpus¹:

  **Recordings:**
  - Traditional repertoire, aria compilations, sound quality
  - 135 CDs in 76 releases; 635 arias from 215 plays
  - [http://musicbrainz.org/collection/40d0978b-0796-4734-9fd4-2b3ebe0f664c](http://musicbrainz.org/collection/40d0978b-0796-4734-9fd4-2b3ebe0f664c)

  **Scores**
  - Two collections of full plays (31 vols.), one collection of arias (2 vols.)
  - 317 arias from the corpus of recordings (48.5 %)

---
2. Methodology

- Comparative analysis

- Computationally obtained statistical information
  - Music21 toolkit (http://web.mit.edu/music21)
  - https://github.com/Rafael-Caro/Jingju-Score-Analysis
2. Methodology

Reference textbooks:


Datasets:

<table>
<thead>
<tr>
<th></th>
<th>manban</th>
<th>yuanban</th>
<th>kuaiban¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>passages</td>
<td>8 (2)</td>
<td>7 (1)</td>
<td>12 (1)</td>
</tr>
<tr>
<td>couplets</td>
<td>21 (4)</td>
<td>23,5 (2)</td>
<td>84 (13,5)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<th>yuanban</th>
<th>kuaiban¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>passages</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>duration</td>
<td>33' 52.8''</td>
<td>21' 11.7''</td>
<td>15' 35.1''</td>
</tr>
</tbody>
</table>

¹ Including liushui
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3. Results:  1. yuanban

opening line

closing line
3. Results:  2. yuanban to manban

opening line

closing line
3. Results: 2. yuanban to manban

**yuanban**

Tempo range: 64.3 - 81.7 bpm

Pitch range: C#4 - G#5

Interval histogram

Mel. density: 2.0 - 6.0 n/s

**manban**

Tempo range: 31.1 - 43.9 bpm

Pitch range: B3 - B5

Interval histogram

Mel. density: 2.3 - 10.3 n/s
3. Results: 2. yuanban to manban

**yuanban**

Tempo range: 64.3 - 81.7 bpm

**manban**

Tempo range: 31.1 - 43.9 bpm
3. Results: 2. *yuanban* to *manban*

![Graph showing pitch range from C#4 to G#5 for *yuanban*.](#)

![Graph showing pitch range from B3 to B5 for *manban*.](#)
3. Results:  

2. yuanban to manban

Pitch range: B3 - B5
3. Results:  2. *yuanban* to *manban*

![Histograms showing interval distribution for yuanban and manban]
3. Results:  2. yuanban to manban
3. Results: 2. *yuanban to manban*

- manban

Mel. density: 2.3 - 10.3 n/s
3. Results: 3. yuanban to kuaiban

opening line

closing line
3. Results: yuanban to kuaiban

**yuanban**
- Tempo range: 64.3 - 81.7 bpm
- Pitch range: C#4 - G#5
- Interval histogram
- Mel. density: 2.0 - 6.0 n/s

**kuaiban**
- Tempo range: 83.7 - 215.8 bpm
- Pitch range: C#4 - G#5
- Interval histogram
- Mel. density: 1.0 - 2.0 n/s
3. Results: 3. yuanban to kuaiban

**yuanban**

Tempo range: 64.3 - 81.7 bpm

**kuaiban**

Tempo range: 83.7 - 215.8 bpm
3. Results: 3. *yuanban to kuaiban*

**yuanban**

Pitch range: C#4 - G#5

**kuaiban**

Pitch range: C#4 - G#5
3. Results: 3. yuanban to kuaibian

- yuanban
  - Pitch range: C#4 - G#5
  - Normalized Count

- kuaibian
  - Pitch range: C#4 - G#5
  - Normalized Count
3. Results:  3. yuanban to kuaiban

**yuanban**

Interval histogram

**kuaiban**

Interval histogram
3. Results: 3. yuanban to kuaiban

**yuanban**

Mel. density: 2.0 - 6.0 n/s

![Box plot of yuanban notes per syllable](image)

**kuaiban**

Mel. density: 1.0 - 2.0 n/s

![Box plot of kuaiban notes per syllable](image)
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<td>Tempo range from 64 - 82 to 84 - 216</td>
<td></td>
</tr>
<tr>
<td>Almost same pitch space</td>
<td>No use of 7th degree (mostly 1st, 3rd, 5th, 6th)</td>
<td></td>
</tr>
<tr>
<td>Increase of major 2nds: richer ornamentation</td>
<td>Larger intervals (fourths)</td>
<td></td>
</tr>
<tr>
<td>Melodic density from 2 - 6 n/s to 2 - 10 n/s</td>
<td>Melodic density from 2 - 6 n/s to 1 - 2 n/s</td>
<td></td>
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<td>Almost no use of melismae</td>
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**Acknowledgements**

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</tr>
<tr>
<td>Longer melismae</td>
<td>Almost no use of melismae</td>
<td></td>
</tr>
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</table>
Tempocurves: yuanban
Tempocurves: *manban*
Tempocurves: *kuaiban*
Tempocurves: liushui
State of the art

<table>
<thead>
<tr>
<th>Tempo</th>
<th>Metrical Type</th>
<th>Metrical Organization</th>
<th>Melodic Tendencies — Degree of Melisma and Ornamentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>slow</td>
<td>slow-meter</td>
<td>XOOO</td>
<td>Number of notes per line in examples</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4/4</td>
<td>7 w-c* lines</td>
</tr>
<tr>
<td></td>
<td>fast-three-eyes-meter</td>
<td>XOOO</td>
<td>10 w-c* lines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4/4</td>
<td>32 lines</td>
</tr>
<tr>
<td></td>
<td>primary-meter</td>
<td>XOXO</td>
<td>7 w-c* lines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2/4</td>
<td>18 lines</td>
</tr>
<tr>
<td></td>
<td>two-six-meter</td>
<td>XOXO</td>
<td>24 lines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2/4</td>
<td>16 lines</td>
</tr>
<tr>
<td></td>
<td>flowing-water-meter</td>
<td>XXXX</td>
<td>24 lines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/4</td>
<td>18 lines</td>
</tr>
<tr>
<td></td>
<td>fast-meter</td>
<td>XXXX</td>
<td>14 lines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/4</td>
<td>(14) lines</td>
</tr>
</tbody>
</table>

- **melismatic**
- **sylablic**

State of the art