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Quantifying and Qualifying Heterophony In JINGJU Music

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Computational Musicology

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Jingju Music

Key concepts[2]

Shengqiang: Melodic features, structured according to the lyrics

Banshi: Rhythmic features, such as tempo, meter, and expressive range

Banshi	Meter	Tempo	Function
erliu	2/4	Moderately Fast	Expectation
manban	4/4	Slow	Introspection



“未曾开言泪汪汪”

RESEARCH QUESTION

A common aspect of Jing Ju is **heterophony**:

*‘Multiple **variations of the same melodic line** that are heard **simultaneously** across different voices. These variations can range from small to longer runs in a single voice, as long as the melodic material stays relatively constant’ [1]*

Eterophonicity articulates **between actor (singing voice) and accompaniment**.

WHAT DO RHYTHMIC AND MELODIC ASPECTS OF HETEROPHONY DEPEND ON ?

- **Quantify** eterophonicity depending on **rhythmic duration** and **melodic intervals**
 - Compute **mean** and standard **deviation**
- **Qualify** eterophonicity depending on **context**
 - Look at the data from a wider perspective and try to see whether some **patterns** emerge, depending on factors like e.g.;
 - Lyrics, role type, Shengqiang, Banshi, section

Methodologies

How do we computationally define heterophony?

For each voice melody note, we check whether heterophony is present or not. If is present, we calculate its duration and its melodic interval. Same pitch classes are not considered in heterophony computation.

This excerpt contains;

- 1/16th duration of Minor 10th heterophony
- 1/16th duration of Minor 7th heterophony



- For simplicity, we could wrap all intervals around the octave (the intervals listed above become Minor 3rd and Minor 7th)
- Similar rhythms
- Overlapping melodic notes & contours
- Do we exclude those which are ‘too identical’?

THANK YOU FOR YOUR ATTENTION!

Any questions?



REFERENCES

[1] Texture – OPEN MUSIC THEORY, Samuel Brady and Mark Gotham,
<https://viva.pressbooks.pub/openmusictheory/chapter/texture/>

[2] Tutorial on Jingju Music, Rafael Caro Repetto
<https://www.youtube.com/watch?v=wBR8m031Frw>