

Three related corpora in Middle Byzantine music notation and a preliminary comparative analysis

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ABSTRACT

The Middle Byzantine notation is used to capture the plainchant melodies of eastern Orthodox Christian music from the middle of the 12th century until 1814. In the context of this research, we study the evolution of a subgenre of Byzantine music known as heirmologic. We present three heirmologic corpora spanning the periods before, during and after the 16th century. We discuss the challenges we faced during the digitisation process and the steps we took to overcome them. For the analysis of the three corpora, we apply the three methods, namely notational texture, melodic arch similarity, and Jensen-Shannon distances of Markovian models, the second of which is novel and inspired by the idea of melodic arches. Through these methods, we aim at highlighting the differences of the corpora in order to obtain an outline of the evolution of the subgenre. We observe that the post-16th century heirmologic pieces are more similar to the 16th-century ones, while there is a greater difference with the pre-16th century pieces. This indicates that the 16th century constitutes a turning point in the melodic features of the heirmologic subgenre.

RESEARCH QUESTION

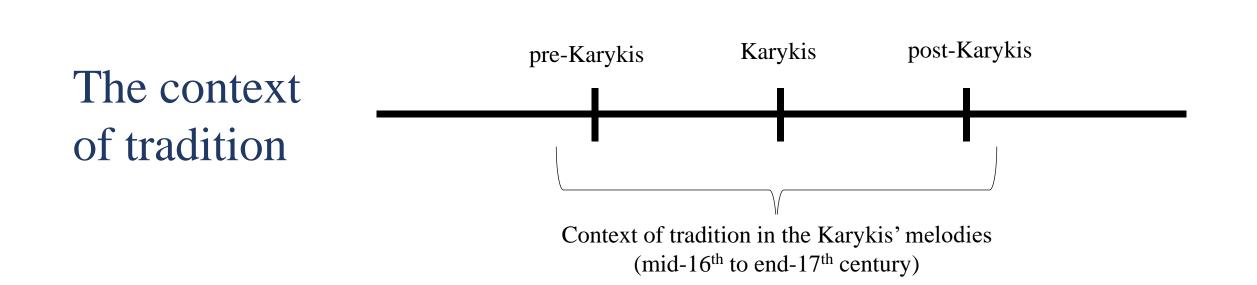
We study the evolution of the heirmologic sub-genre in the 16th-century Heirmologion of Karykis.

We define the **evolution** of a sub-genre under the lens of the **contribution** of a musical work in the context of tradition, specifically an examined work in relation to the previous and the following works of this sub-genre.

> High contribution of a music work X means High musical distance between X and pre-X AND Low musical distance between X and post-X.

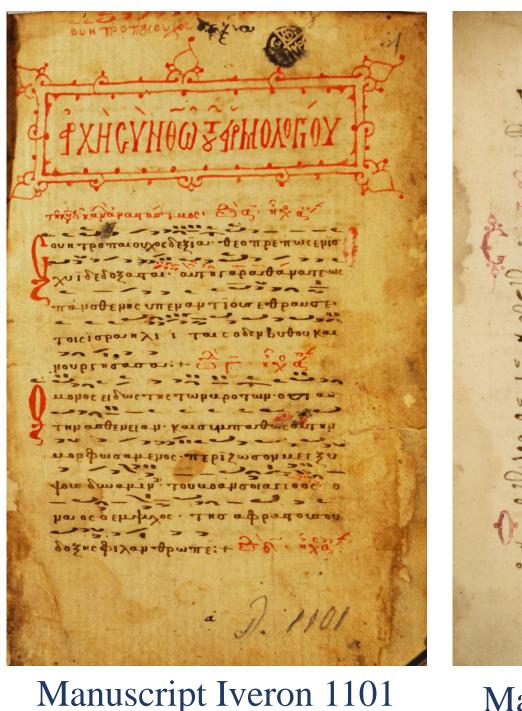
To capture the concept of musical distance, we define metrics that give us an insight into the similarity of the corpora.

DEFINITION OF THE CONTEXT OF TRADITION



DIGITISATION OF THE THREE CORPORA

Three corpora; 128 music pieces have been digitised for each corpus.

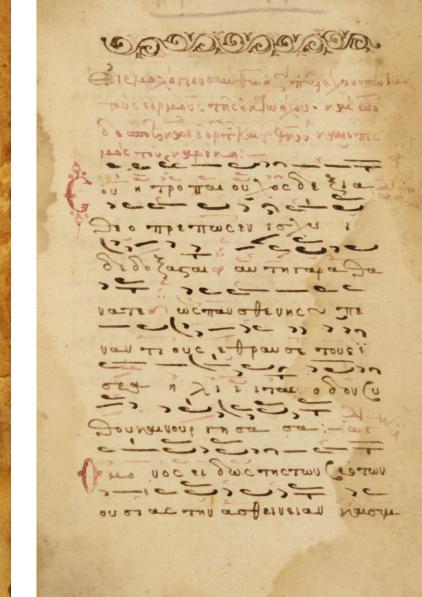


(pre-Karykis)

Karykis-Balasis

Reference line

Results

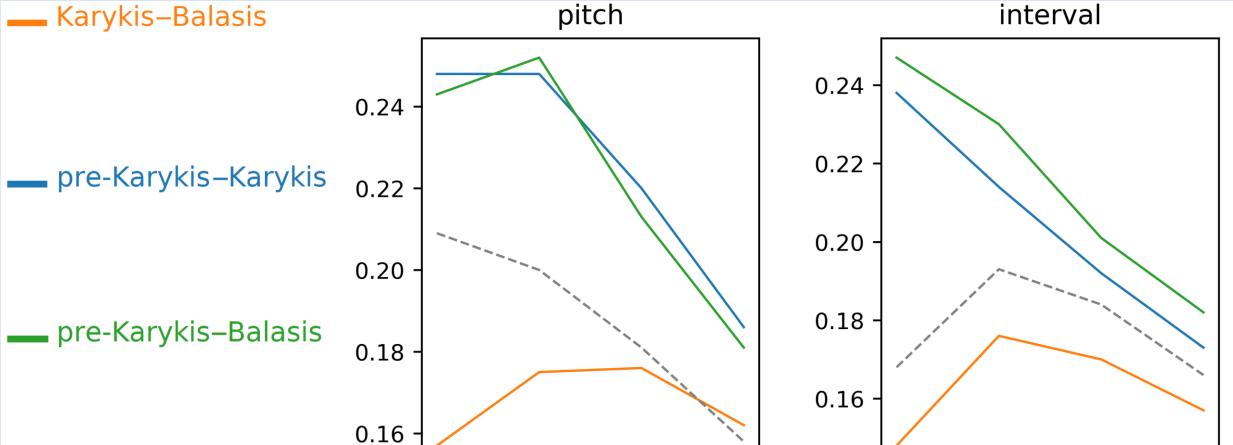


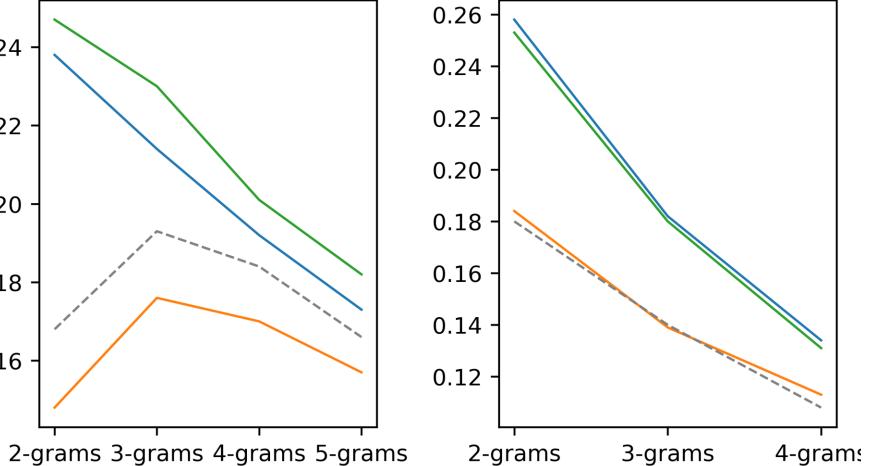
2-grams 3-grams 4-grams 5-grams





Manuscript Sinai 1433 (post-Karykis)





Pitch

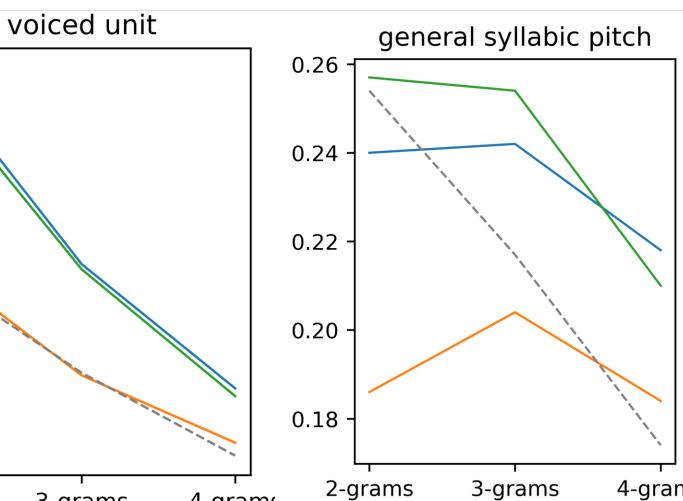
Interval

Voiced unit

GenSylPitch

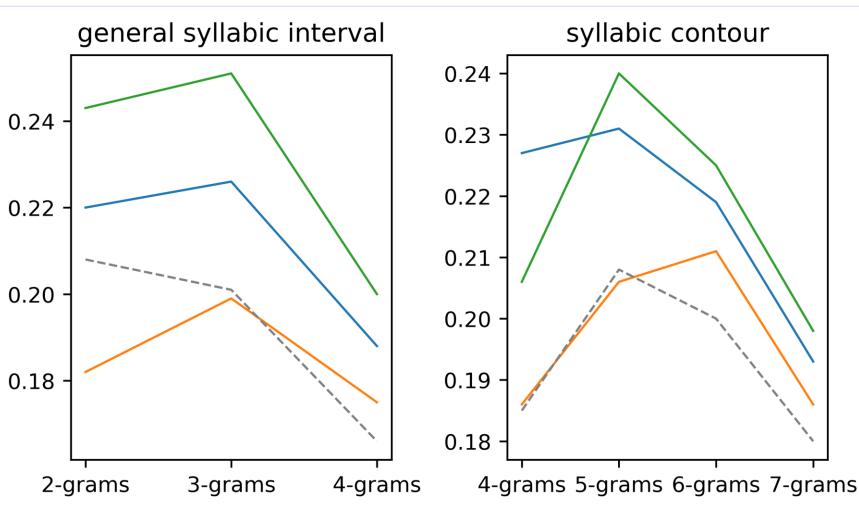
GenSylInt

contour



+2

-1



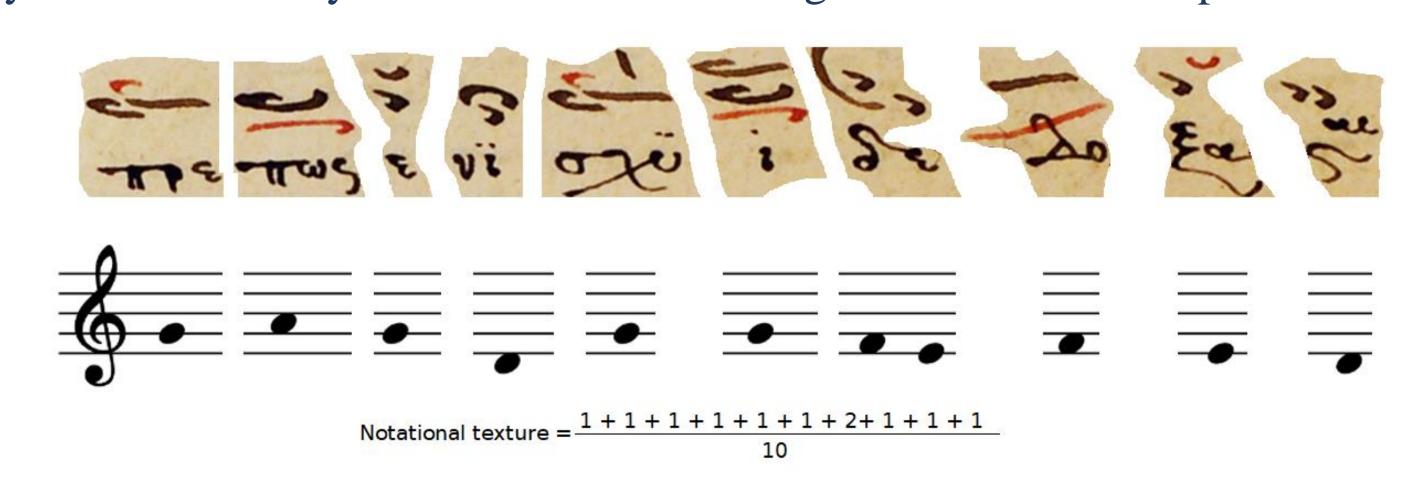
+2

pk3

+2

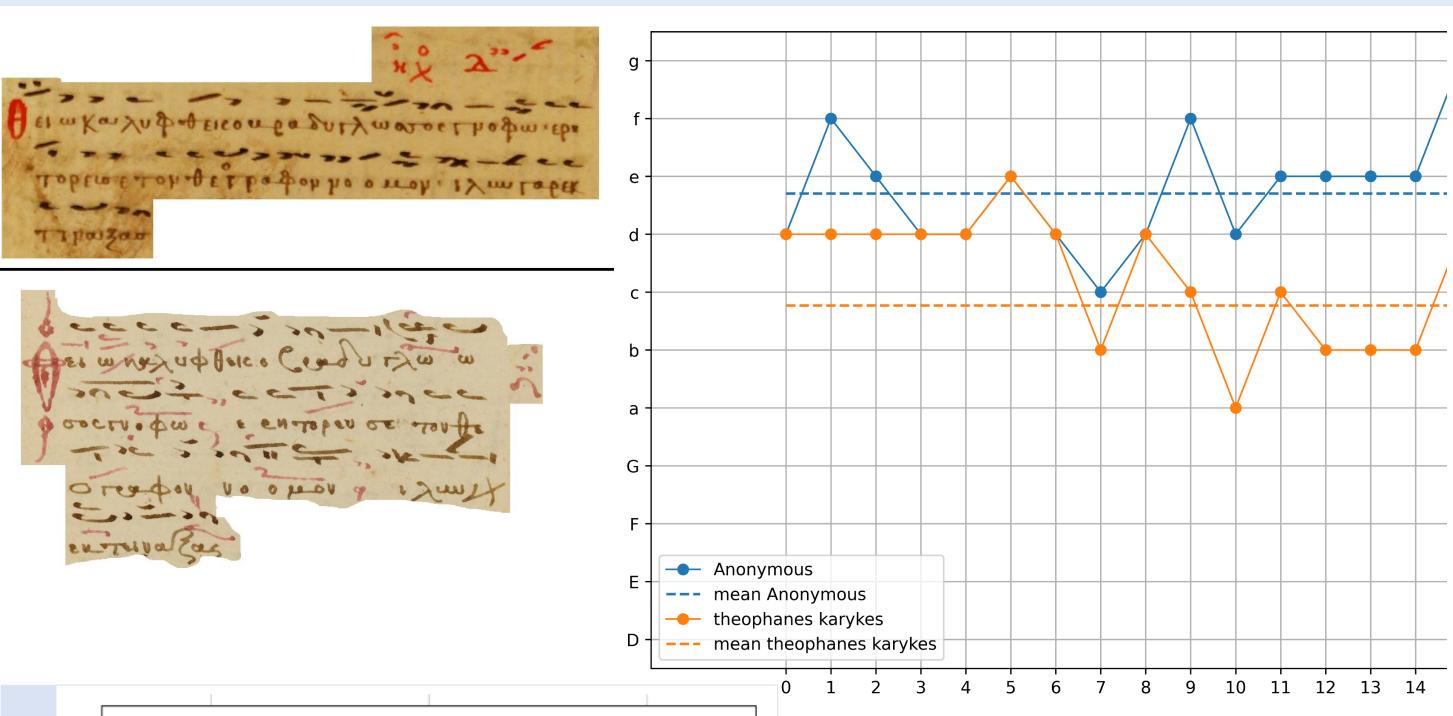
DISTANCE IN TERMS OF NOTATIONAL TEXTURE

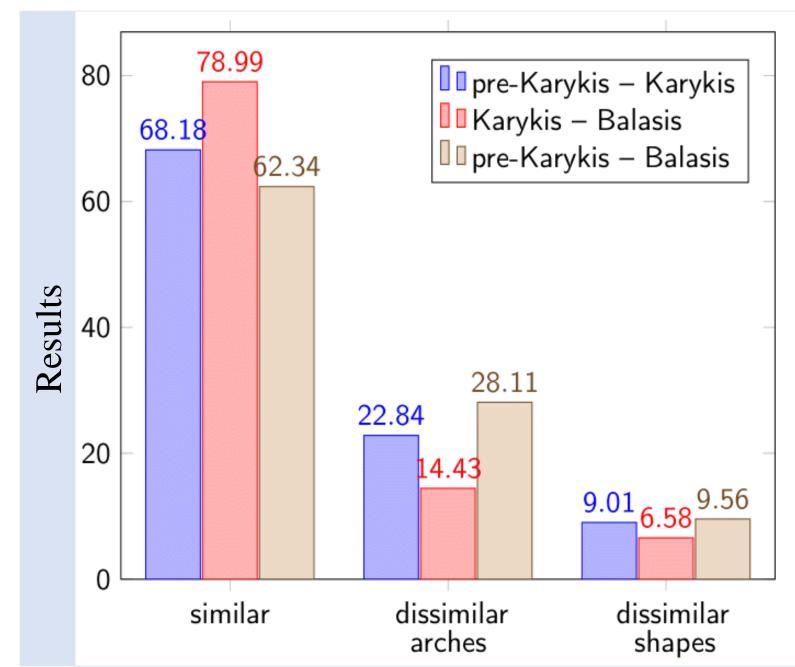
Notational texture is the average number of notes, time beats, or signs per syllable. Similarity is the ratio of the averages between two corpora.



Results	corpora	Pre-Karykis	Karykis	Post-Karykis
	texture	1.22	1.13	1.23

DISTANCE IN TERMS OF MELODIC ARCHES





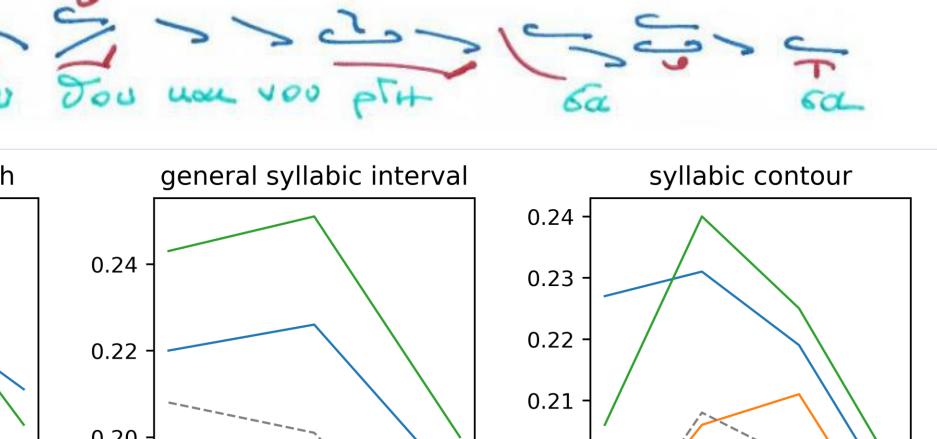
Similarity of the melodic arches is a novel method that translates all the music pieces of the three corpora into sequences of two types of arches (convex or concave) and then compares the sequences to depict a metric of similarity.

JENSEN-SHANNON DISTANCE OF MARKOVIAN MODELS

Measuring the melodic distances of the corpora using the Jensen-Shannon distance of the Markovian models of the features in different orders.

For each music piece, we took six different representations as sequences of pitches, intervals, voiced units, general syllabic pitches, general syllabic intervals, and melodic contour of syllables.

Note that Voiced units are the signs of the notation that give us the intervals, and the last three representations are redundancies of the pitch and interval features.



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BASIC BIBLIOGRAPHY