

MELODIC KEY PHRASES IN TRADITIONAL CRETAN DANCE TUNES

Andre Holzapfel

Boğaziçi University & ITÜ MIAM
{andre}@rhythmos.org

1. INTRODUCTION

In the Mediterranean island of Crete, local music traditions were a rather rural phenomenon about 40 years ago. In the urban environments of Crete, European or Greek art musics were preferred, and little value was attached to the local music idiom, which is referred to as Cretan music (*kritiká*) by the the local population. Even in village festivities, Cretan music represented only a part of the repertoire, while “European” dances (*evropaiká*) like the Waltz and the Tango played a very important role in the rural social events. At some point in the 1980’s, however, the first concert events were established in the rural environments that featured concerts of Cretan music. Apparently, this shift of the performance context of Cretan music from local festivities to the stages of professionally programmed concert events marked a turning point towards an increasing popularity of Cretan music in all parts of Crete, including the urban environments. Nowadays, we encounter Cretan music all over the island of Crete. During the summer months, the municipalities of all cities and village areas organise regular concert events that feature Cretan musics as well as musics from other parts of Greece and beyond. In the year 2011 I counted a total of five radio stations operating in the city of Heraklion, with a total of 200.000 inhabitants, that broadcast exclusively Cretan music. A large number of dance schools in all areas offer lessons on Greek folk dances, and the curriculum of every such school includes Cretan dances, with the number of different Cretan dances being taught nowadays reaching the number of 20.

Cretan dances share a large set of characteristics. Most dances are circular dances, performed counterclockwise. Specific emphasis is given to the movements of the feet, while the upper part of the body remains widely motionless. The dancer leading the circle has, at least for many of the dances, the freedom to improvise on the standard sequence of steps. Regarding their musical properties, all Cretan dances are usually notated as having 2/4 meters. Rhythmic accompaniment, in most cases provided by one or more Cretan lutes, makes use of a limited set of rhythmic patterns. Especially for the faster leaping dances, which make up the largest group in number, these patterns, depicted in Figure 1, are shared between the different dances.

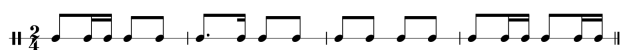


Figure 1: Rhythmic patterns reported by Kaloyanides (1975) for Cretan leaping dances

In terms of melodic content, the Cretan dance tunes are built from the concatenation of short melodic phrases, referred to as *kontiliés* by the local musicians, and played in most cases by the Cretan fiddle (*lýra*) or violin. These melodic phrases span a duration of two bars for most of the leaping dances, and many of these phrases are related to certain musicians of previous generations, and are often assigned to a specific dance. The cataloguing of melodic phrases in Greek music was approached, for instance, by Theodosopoulou (2004) for specific Cretan tunes, and by Sarris (2007) for bagpipe tunes from the Greek mainland. Locating important melodic patterns has been previously attempted by Conklin & Anagnostopoulou (2011) using existing transcriptions for analysis. However, the resulting patterns were usually shorter than the two- or four-bar length of the Cretan *kontiliés* and have a less obvious musical meaning as identifier of the specific tune. The mentioned attempts make use of manual transcription and while they provide valuable insight into the sequential structure in which *kontiliés* are applied in various tunes, to the best of my knowledge so far no analysis has been published that aims at the identification of meaningful key phrases. Such key phrases might serve the function to identify certain dances, and help the participants in a music event to differentiate between dance tunes. In this paper, a method that we previously presented for the alignment between performance recordings and notations of Turkish Makam music (Şentürk et al., 2014) will be applied to analyse the melodic phrases contained in a set of leaping dance recordings. This analysis works automatically to a large extent, and therefore enables for an analysis of a larger corpus of recordings.

In this paper, Section 2 will give a short summary of the computational methodology, referring to the initial papers for further detail in order to restrain the technical description within this paper. In Section 3, a set of performances of five leaping dances is analysed and the question is addressed in how far these dances can be differentiated by using melodic information. Since the results demonstrate the importance of melodic phrases as identifiers for the dances, I do a first steps towards a documentation of the melodic key phrases in Section 4, and Section 5 will conclude the paper.

2. COMPUTATIONAL METHOD

In performances of Cretan music, the most common lineup consists of Cretan *lýra* or violin as main melodic instrument, and one or more accompanying Cretan lutes. If

more than one lute is present, usually one lute doubles the main melody with the lead instrument in a heterophonic way. In order to estimate the melody in such (non-monophonic) recordings, I applied the analysis algorithm presented by Salamon & Gómez (2012), which is tailored for the task of estimating the lead melody out of a music signal. Using these pitch estimations as input, I applied the algorithm that we proposed for the scope of matching two melodies (Şentürk et al., 2014). This algorithm takes two vectors that contain pitch values, and tries to find (partial) occurrences of the melody of the first vector in the melody described by the second vector. I will refer to the first vector as the query and the second vector as the target melody. For each performance recording to be analysed I annotated beats and downbeats using the approach presented in Holzapfel et al. (2014). Melodic patterns in Cretan music typically have a length of either two or four measures in the analysed dances. Using the obtained beat and downbeat annotations, the recordings can be segmented into slices of four measure length. The pitch estimations obtained from these slices will be used as queries, trying to locate their re-occurrences in other recordings.

The method of pattern matching (Şentürk et al., 2014) computes differences in pitch values, but allows for a certain amount of inaccuracy for the matching. To be precise, we demanded the matched melodic patterns to be at least of one measure length, and that at most a duration related to an eighth-note can be different between two matched patterns. The pitch tolerance for two pitches to be judged as identical is a quarter tone. These tolerances make the method robust to technical problems in the pitch estimation, and to slight differences between the performances caused, for instance, by ornamentations.

3. PHRASE DIVERSITY IN LEAPING DANCES

The music corpus used in this paper contains 22 audio recordings, each assigned to one of five different leaping dances. The recordings are obtained from commercially available recordings of renowned Cretan musicians. Currently, a larger set of recordings is prepared for an analysis, including material from our field work in Crete. The analysis of this larger corpus will be subject of a future publication, and will enable to obtain a more detailed understanding of melodic phrases than the insights obtained from the relatively small corpus in this paper. Table 1 specifies the names of the dances as they are usually referred to in Crete, along with the number of pieces and bars of 2/4-meter for each of the dances.

I applied the approach described in the previous section, and counted the number of times in which a query phrase from a specific dance recording is encountered in a different performance. I categorised each of these encounters according to the class of dance, in which the matched target phrase was found. This procedure provides us with a set of five histograms, one for each dance, as depicted in Figure 2. In the histogram for Dance A, for instance, the five bars denote the probability to encounter a phrase from Dance A in a different recording of Dance A, B, C,

Dance	Number of Pieces	Number of Bars
Anogianos	4	819
Ethianos	2	396
Maleviziotis	4	953
Sousta	8	1873
Sitiakos	4	1278
Total	22	5319

Table 1: Number of samples per dance and number of bars available for the analysis in the following experiments.

D or E, respectively. The histograms were sorted according to the clarity of results; Especially the histograms for the *Anogianos* and *Ethianos* dance tunes indicate that these dances have a melodic material that is not shared with the other dances (very small bars for dances different from the query melody). However, even for Dance E, melodic phrases reoccur most of the time in dance tunes of the same dance (the fifth bar marked 'Sit' is the largest).

The clarity of the differentiation especially for dances A and B could be presented as a result of geography; Both *Anogianos* and *Ethianos* are dances from remote mountain areas of Crete. On the other hand, the recent historical development of performance context seems to be an even more likely explanation to me; Both dances do until now not play a major role in the concert performances, but appear only if demanded by the audience. On the other hand, *Sousta* and especially *Maliviziotis* are integral part of most festivities in Crete, and therefore represent dances that underlie a lively process of permanent re-invention at every moment of performance. This is caused by the fact that the sequence of melodic phrases used in each performance is improvised to a wide extent and can be changed according to the demands of the performance situation. This dynamic process might have lead to a stronger exchange of melodic phrases with other dances. A particular role is taken by the *Sitiakós* dance, which is considered a variant of the *Maleviziotis* by many informants from central Crete, something that is rejected by informants from the Eastern part of Crete, where this dance has its origins. In its histogram (Dance E) its strong relation with the *Maleviziotis* can be recognized (the third bar is the second highest after the bar relating the dance to itself). However, an answer regarding origins shall not be attempted at this place. Rather than that, I would like to point out that these dances are rather an impressive documentation how local expressions travel and interact with other expressions, a process of constant change and negotiation that was also proposed as a redirection of research agenda in anthropology recently (Clifford, 1997).

Both the presented analysis and information from interviews support that the melodic phrases that occur only within a particular dance have some significance for the identity of the dance tune. Within an analysis that will be presented as an upcoming book chapter (Holzapfel, 2015), tempo aspects and aspects of rhythmic accentuation were examined as well. Tempo shapes a clear difference be-

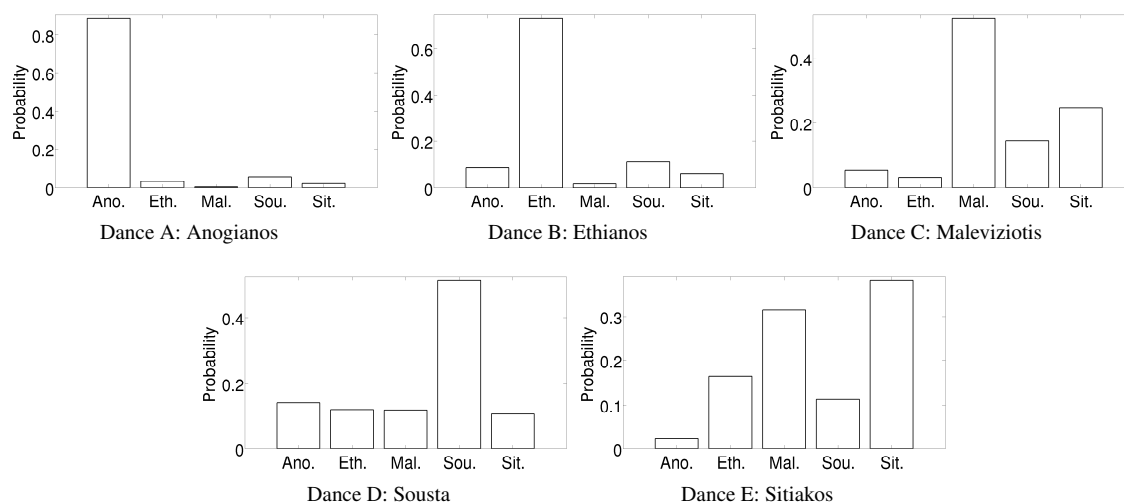


Figure 2: Distribution of the detected melodic patterns for the five dances.

tween some dances, such as the *Maleviziótis* and the *Sousta*, two dances that differ widely regarding the body motions and spatial organisation, with the former being a circle dance and the latter being a partner dance. The overall difference in physical expression of these dances is clearly related to their tempo differences, with the *Sousta* being one of the slowest leaping dances in Crete. Rhythmic accentuation, on the other hand, appears to play a more subtle role than tempo differences. While some lute players state that they place rhythmic accents differently depending on the dance, these differences depend on the players, and it will need to be established in future field work in how far different stroke patterns on the lute are used depending on the dance. The role of the rhythmic accentuation by the *lyra* was emphasised by several informants in Crete. For instance, the dance teacher Vangelis Stafilas (2011) stated that the bow stroke for the *Pentozális* dance would be very rough compared to the ones of *Maleviziótis* and especially *Sousta*. Within various *lyra* seminars, techniques to vary the bow strokes are taught (Spiridakis, 2013), but a detailed study of these techniques remains to be conducted.

However, my analysis as well as the conducted interviews assign a major importance to the choice of the *kontiliá* for the differentiation between dances. Dance teacher Yannis Panagiotakis (2013) has no doubt that the recognition of the dance tune is based on memorising the melodies of the *kontiliés* belonging to all the different dances. This is consistent with my observations during a listening test that I conducted with dancing teachers, experienced dancers, and Cretan citizens without larger dance experience (Holzapfel & Stylianou, 2011). I asked the subjects to rate the similarity between a query and two recordings taken from different performances than the query. One of these two recordings was from the same dance as the query (but from a different performance), while the other was from a different dance. I observed that the dance teachers did their rating after listening to about a second of each recording, meaning that they did not even listen to the whole phrases, but the first notes were sufficient for them to relate the sound to

a memorised phrase. The experienced dancer usually listened to the whole recording (of about 10s length), while the inexperienced often chose to listen to the samples several times looking for the important cues to guide their decisions. While these results are rather informal due to the small group of subjects, they confirm the statement of Yannis Panagiotakis, and the results depicted in this section that state that the melodic content of the short phrases is a major cue for identifying the dances.

4. A CATALOGUE OF KEY PHRASES

In Figure 3 examples for *kontiliés* are depicted that appeared frequently, but almost exclusively within a specific dance within the corpus. Most patterns found so far are clear markers for the dances they were found in, judging by the expertise of my collaborators and me. It is worth pointing out again that the identification of these phrases works almost completely automatically, with the only manual steps being the selection of recordings and an inspection of the automatic beat annotations.

Only throughout the recent years, Cretan music is taught to a wider extent within music seminars in Crete to interested musicians. The first person to systematically approach teaching of Cretan music was the *lyraris* Kostas Mountakis, in 1979 and throughout the 1980's, interestingly in parallel to the appearance of the first Cretan music concert events. Another important catalyst for the increasing interest in Cretan music was the foundation of the *Labyrinth* music workshops¹, initiated by the musician Ross Daly, and since then supported by a large group of international music teachers. While the teaching within the *Labyrinth* workshops embraces many music cultures, it contributed to the interest of young musicians into studying Cretan music within the setup of a very focused seminar environment.

The demand for seminars and the increased interest in Cretan music on concert stages interacts with the increas-

¹ www.labyrinthmusic.gr

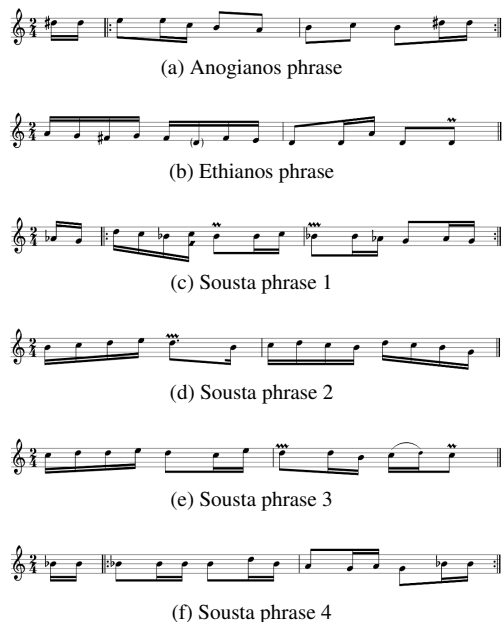


Figure 3: Some examples of phrases that were found to appear frequently exclusively in one particular dance.

ing number of tunes that are discovered and re-invented in various areas in Crete. This process is driven by groups of local researchers, with and without academic affiliations, and feeds the increased interest of the public into the tunes that identify various local micro-cultures in Crete. An increasing number of melodic phrases is the outcome, and discovering these phrases and reflecting on their meaning in collaboration with the local communities is a driving motivation for my field work, as I will point out in the concluding remarks.

5. CONCLUSION

It is apparent from my experiments as well as from information from various interviews and field observations that melodic phrases of the kind depicted in Figure 3 carry a diverse set of meanings for the local musicians. These meanings go beyond the identification of a dance tune. These meanings have historical and aesthetic dimensions, and by bringing the discovered analysis results back into the field, I hope to obtain deeper insights into these interpretations. The melodic key phrases presented in this paper will be discussed with musicians in Crete, during my subsequent field work in Crete during summer 2015. Apart from verifying their ability to identify dances, the goal is to discover the context and the genesis of these patterns, and to reveal the different meanings that they might have to individual musicians. Such kind of a discussion regarding the inherent structure of a music is hard to accomplish using purely ethnographic approaches, and the combination of ethnography with the presented analytic results can hopefully provide intuitive ways to establish a deeper discourse with the local musicians. Apart from that, as mentioned above, I hope that such a research can support the ambitious teaching activities of local musicians. Such a support

can be provided, for instance, by providing printed material including transcriptions of key phrases. While such transcriptions might not be of interest for most experienced Cretan musicians, especially musicians coming from written music traditions can be supported in obtaining an understanding of Cretan music more easily. Since many musicians embrace the usage of technology in various ways, I consider this an offer I can make to the community.

6. ACKNOWLEDGEMENT

I would like to thank Michael Hagleitner for the great research collaboration over the years. I would also like to thank my advisor Robert Reigle for his continuing support. This work is supported by a Marie Curie Intra-European Fellowship (grant number 328379).

7. REFERENCES

- Clifford, J. (1997). *Routes: Travel and Translation in the Late Twentieth Century*. Cambridge, MA: Harvard University Press.
- Conklin, D. & Anagnostopoulou, C. (2011). Comparative pattern analysis of cretan folk songs. *Journal of New Music Research*, 40(2), 119–125.
- Şentürk, S., Holzapfel, A., & Serra, X. (2014). Linking scores and audio recordings in makam music of Turkey. *Journal for New Music Research*, 43(1), 34–52.
- Holzapfel, A. (2015). Patterns of identity: Rhythmic and melodic aspects of Cretan leaping dances. In *Music on Crete, Traditions of a Mediterranean island*. Vienna Series in Ethnomusicology, in press.
- Holzapfel, A., Krebs, F., & Srinivasamurthy, A. (2014). Tracking the “odd”: Meter inference in a culturally diverse music corpus. In *Proceedings of ISMIR - International Conference on Music Information Retrieval*, (pp. 425–430)., Taipei, Taiwan.
- Holzapfel, A. & Stylianou, Y. (2011). Scale transform in rhythmic similarity of music. *IEEE Transactions on Audio, Speech and Language Processing*, 19(1), 176–185.
- Kaloyanides, M. (1975). *The Music of Cretan dances, a study of the musical structures of Cretan dance forms as performed in the Irakleion province of Crete*. PhD thesis, Wesleyan University.
- Panagiotakis, Y. (2013). Personally conducted interview.
- Salamon, J. & Gómez, E. (2012). Melody extraction from polyphonic music signals using pitch contour characteristics. *IEEE Transactions on Audio, Speech and Language Processing*, 20(6), 1759–1770.
- Sarris, H. (2007). *The bagpipe in Evros (in Greek language)*. PhD thesis, University of Athens. in Greek language.
- Spiridakis, Z. (2013). Music Seminar in Houdetsi.
- Stafilas, V. (2011). Personally conducted interview.
- Theodosopoulou, I. B. (2004). *Methodology of morphological analysis and analytic data of small rhythmic patterns of cretan folk music, (in Greek Language)*. Athens: Kultura.