

Does Always the Phrygian Mode Elicit Responses of Negative Valence?

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The Fourth International Workshop on Folk Music Analysis
Bogazici University
June 12-13, 2014

1 Prior work

Research question: Is the Phrygian mode always associated with perceived emotional responses of negative valence?

Ramos et al. [1] studied the effect of mode on the perceived emotion. Their main findings were:

- 1.- Change in mode is enough to modulate emotional judgements.
- 2.- Manipulation of mode and tempo do not result in sudden changes of emotion.
- 3.- The Phrygian mode is associated with negative valences.
- 4.- There seems to be an association of Phrygian modes with sadness, which does not change very much when tempo is increased.

2 Research questions

The study of Ramos et al. [1] suggests that the Phrygian mode is associated to negative valences, in particular with sadness.

Our research questions are the following:

- 1.- To confirm by conducting further experiments whether their findings are general or limited to the music used in their experiments.
- 2.- Does the Phrygian mode induce the same emotional responses irrespective of the musical tradition?
- 3.- If mode is fixed, what other musical variables influence the emotional response?
- 4.- Since the study of Ramos et al. were conducted on adults, we wanted to look into the emotional response of children to the Phrygian mode.
- 5.- Study the emotional response of children who have not been exposed to music written in Phrygian mode but belonging to an unfamiliar music tradition.

5 Musical pieces

Galician piece



Flamenco piece



4 Musical pieces

Three types of pieces:

- 1.- Flamenco music (Phrygian mode).
- 2.- Galician music (Phrygian mode).
- 3.- Castilian music (major mode).

Pieces in major mode were used to avoid bias in the experiment.

3 Experiments

- 124 children of 4-7 years of age.
- Some had musical training, some did not.
- They listened to pieces written in Phrygian and major mode.
- They were unfamiliar with the Phrygian mode.

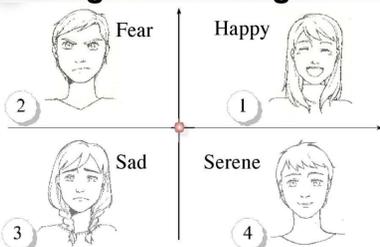
7 Stimuli

- Each child listened to 6 or 12 pieces.
- In total, there were 6 flamenco pieces, 6 Galician pieces, and 6 Castilian pieces.

6 Stimuli

- Similar melodic contour.
- Piano timbre.
- Three tempi: 72, 104, and 144.
- Presentation was randomized (tempo/corpora).

8 Identifying emotions through face recognition

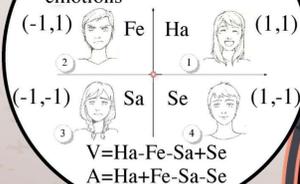


9 Results

- Figure 1 below shows the categories of emotion chosen by participants.
- In Galician music, as tempo increases, happiness increases, but serenity increases and decreases.
- In flamenco music, as tempo increases, happiness and sadness varies little, and serenity is kept constant and then decreases by a small amount.

10 Results

- Valence (V) and arousal (A) values obtained from emotions



11 Results

- A 3(tempi)x(3 corpora) ANOVA analysis was run.
- Arousal was the dependent variable.
- No statistical significant reached: F-value=1.315, df=4, MSE=1.244, and p-value=0.262.
- Figure 2 displays the averaged values of arousal and valence found.
- Neither Galician music nor flamenco presents a linear increasing of the arousal values.
- Flamenco is always in the serenity quadrant.

References

[1] Ramos, D., Bueno, J.L. and Bigand, E. (2011). *Manipulating Greek musical modes and tempo affect perceived musical emotion in musicians and non-musicians*. Brazilian Journal of Medical and Biological Research vol. 44, pp. 165-172.

12 Conclusions

- Our results suggest that the Phrygian mode is not necessarily associated to emotions of negative valence.
- Our findings suggests that the Phrygian mode is related to serenity.
- Although it is often the case, tempo is not always associated with large increase of arousal.
- In [1] the musical style was not specified. It seems that the particular style is important to emotional responses.
- Mode modulates emotional response, but it does not determine emotional response on its own.
- Further experiments are needed to compare musically trained and untrained children, and also adults and children.

Corpus	Tempo	Happiness	Fear	Sadness	Serenity
Galicia	72	0,27	0,18	0,27	0,27
	104	0,31	0,13	0,25	0,31
	144	0,36	0,14	0,24	0,25
Flamenco	72	0,22	0,16	0,33	0,29
	104	0,24	0,09	0,33	0,34
	144	0,3	0,14	0,23	0,34
Castile	72	0,33	0,19	0,21	0,28
	104	0,42	0,1	0,16	0,33
	144	0,47	0,12	0,16	0,24

Figure 1: Percentages of the emotions chosen by the participants

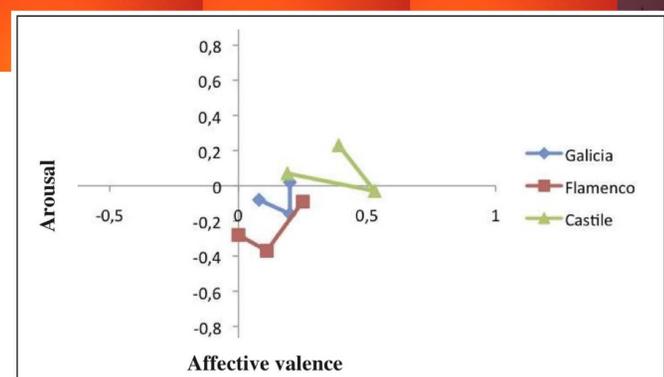


Figure 2: Arousal and valence as a function of tempo

