

DOES ALWAYS THE PHRYGIAN MODE ELICIT RESPONSES OF NEGATIVE VALENCE?

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ABSTRACT

In this paper the question of whether the Phrygian mode is always associated with perceived emotional responses of negative valence is looked into. To this end, we carried out a series of experiments. Music from two musical traditions where the Phrygian mode is very common, flamenco and Galician music, were chosen for listening tests. Our subjects were 124 children of age 4-7. Some subjects were complete unfamiliar with both traditions and some were familiar with the Galician tradition; none was familiar with flamenco music. Results showed that the perceived emotion was in all cases of positive valence, flamenco music having less valence than Galician music.

1. INTRODUCTION

After a few decades of research, some answers can be offered to the central question of which variables affect emotional response. Among those variables, we encounter intervals (Trainor et al., 2002), melodic contour (Juslin & Sloboda, 2010) (chapter 21, pages 575–604), tonal function and harmony (Sloboda, 1991), Costa et al. (2004), texture (Webster & Weir, 2005), and tempo and mode (Dalla Bella et al., 2001), Caetano et al. (2013). Much of the research on mode has focused and still focuses on the effect of mode, in particular, major and minor modes. Ramos et al. (2011) studied the effect of mode on the emotional response. These authors studied the combined influence of tempo and mode by using the seven Greek musical modes.

Several conclusions in the work by Ramos et al. called our attention. For example, they found that the first and third degree of the mode do not determine the emotional expression of the mode. Also, they reached the conclusion that change in mode is enough to modulate emotional judgments. More interesting was the suggestion that manipulation of mode and tempo do not result in sudden changes of emotion. However, the conclusion that seemed worth deserving further research was that the Phrygian mode is associated with negative valence, in particular, there seems to be an association of Phrygian modes with sadness, which, according to those authors, does not change very much when tempo is increased.

We decided to further investigate the apparent association of Phrygian mode with sadness (or feelings of negative valence). We carried out a study by using Galician and flamenco music, two musical traditions where the Phrygian mode is ubiquitous. Furthermore, the subjects of our experiments were children from age 3 to 7. Previous research by the authors can be found in Tizon et al. (2013). The research contained in this paper is a continuation of Tizon

et al. (2013); here experiments were performed on a larger number and more general subjects (with no musical training and from a region whose musical tradition includes the Phrygian mode).

2. THE WORK OF RAMOS ET AL.

The experiments conducted by Ramos and collaborators consisted of the following steps. A piece was composed in major mode and then played in all other musical modes at three different tempi (midi piano timbre was chosen for the stimuli). Adults were used for the listening experiment and they had musicians and non-musicians among their subjects. They only used one piece for the whole experiment. See their paper for further details (Ramos et al., 2011). The Figure below summarizes the main findings (on page 169). This graph shows the seven Greek modes and how the emotional response changes as a function of tempo (dots are connected in increasing tempo).

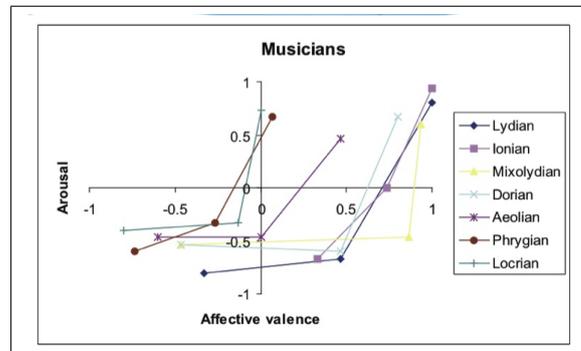


Figure 1: The effect of mode and tempo on the emotional response in Ramos et al. (2011).

It can be noticed how the Phrygian mode is mainly on the quadrant corresponding to sadness and when tempo increases it goes to the first quadrant (that of happiness) but still with low values for the valence.

3. A CLOSER LOOK TO THE PHRYGIAN MODE

As said at the outset, we wanted to further investigate the Phrygian mode. Thus we conjectured that the effect of mode would depend on the particular style, too. Therefore, we set out to carry out further experiments to study the perceptual behavior elicited by the Phrygian mode. We posed ourselves several research questions: (1) Does the Phrygian mode induce the same perceived emotional responses irrespective of the musical tradition?; (2) What is

the perceived emotional response of children to the Phrygian mode?; (3) What is the perceived emotional response of children who are unfamiliar with the given music tradition?

4. EXPERIMENTS

4.1 Participants

124 children of 4-7 years of age participated in the experiment. They listened to pieces written in Phrygian and major mode. The major mode was introduced for the sake of variety of stimuli. Pieces in Phrygian mode were taken from flamenco and Galician musical traditions and pieces in major mode from the Castile tradition. Children were from Galicia and Castile and they were unfamiliar with flamenco music (in the sense that flamenco was not the musical tradition they grew up in).

4.2 Musical stimuli

Pieces were chosen after a careful selection; they should have similar melodic contour (to be sure that was not causing the emotional response). A piano timbre was used for the actual stimuli. The subjects were presented with pieces at three tempi, 72, 104, and 144 bpm. Depending on the age, the subjects listened to 12 pieces or 6 pieces on each session.

4.3 Procedure

As children sometimes have difficulties to verbalize their perceived emotions, we used drawings of faces so that they had only to point to them to give their responses. The Figure below shows an actual response sheet from the experiment. We tested four basic emotions: happiness, fear, sadness, and serenity (read the Figure counterclockwise starting on the first quadrant).

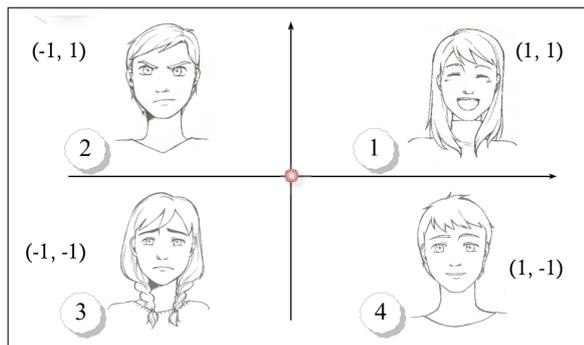


Figure 2: Drawing of faces used in the experiments.

Faces were pre-tested by children and teachers to see if they were adequate. The experiment was carried in groups of 1 to 5 children, depending on age. Also, outliers were identified (some children chose systematically faces by gender). Presentation was randomized by tempo, corpora and faces.

4.4 Results and discussion

In the Table below the emotions most frequently chosen by subjects according to the musical tradition and tempi are

shown. For flamenco and Galician music we observe that sadness and fear, the emotions of negative valence, vary very little with tempi, whereas happiness and serenity do increase.

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

Table 1: Emotions most frequently chosen by subjects in different musical tradition and tempi.

As Ramos et al. did for their experiments, we also mapped the results onto the Russel's circumplex model of affect, which is formed by four quadrants; see Figure below. Each emotion was assigned a pair of values valence-arousal. Thus, happiness is (1, 1), fear (-1, 1), sadness (-1, -1), and serenity (1, -1); see Figure 2. Notice that, irrespective of the musical tradition, all the emotional responses have positive valence (serenity or happiness) in contrast to the results of Ramos et al.

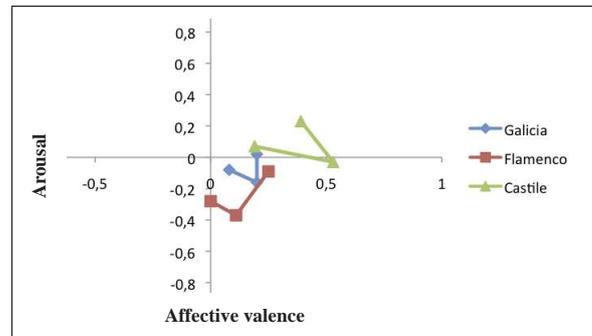


Figure 3: Arousal and valence of emotional responses as function of tempo.

5. CONCLUSIONS

Our results suggest that the Phrygian mode is not necessarily associated to emotions of negative valence. According to our findings, the Phrygian mode seems to be related to serenity. Although it is often the case, tempo is not always associated with large increase of arousal; we run statistical tests (not shown in this abstract because lack of space) to support that fact and they were positive. Arousal increased as tempi increased. It seems that the particular style is important to the emotional response. The musical characteristics of Galician and flamenco music are quite different. Mode modulates emotional response, but it does not determine emotional response on its own.

Our future work will consist of conducting the same experiments with children from Andalucia who are familiar with flamenco music and study how musical enculturation affects the emotional response. We also observed variations on the perceived emotional response across age, which certainly deserves to be further investigated. Also, we would like to repeat all the experiments with adults and compare the results to those obtained with children.

6. REFERENCES

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