

## EMOTION AND COGNITION IN MUSIC: WHICH COMES FIRST?

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### Background

Are emotional reactions to music independent of cognitive processes ? The theories proposed by Francès or Imberty imply that perceiving the key of a piece of music is necessary to perceiving its emotional value.

### Aims

The goal of this study was to test whether the emotional reaction or the (implicit or explicit) perception of the tonality comes first when listening to a piece of music.

### Method

We used sad and peaceful melodies, written for and tested by Peretz. These melodies were played by a professional pianist. Twelve peaceful and twelve sad melodies were used to create forty-eight pairs of melodies : twenty-four pairs of «same emotion,» half of them being sad, and half peaceful; and twenty-four pairs of «different emotion,» half of them beginning with a sad melody, and half beginning with a peaceful melody. Each series of twelve pairs was made of six pairs of the same key, and six pairs of different keys.

The subjects had to listen to the first melody, and to evaluate whether it expressed sadness or peacefulness. Then, as they started to listen to the second melody, they had to say, as fast as possible, if the second melody expressed the same emotion as the first one.

The experiment was organized in two sessions, with a group of musicians and a group of non-musicians (49 subjects).

We hypothesized that the subjects would calculate the key of each melody before being able to assess the emotion it expressed, and thus, that the analysis of our data would show a key effect on the number of correct responses. We expected a larger percentage of correct responses for the pairs of melodies played in the same key, than for the pairs in different keys. We also expected a key effect on time responses. Moreover, we hypothesized that musicians would answer more precisely than non-musicians.

### Results

Our results of the number of correct responses showed a significant key effect, and a significant difference between musicians and non-musicians. The analysis of the time responses showed the same pattern for the key effect, but failed to reach significance.

### Conclusions

This study, though preliminary, shows that cognitive processes and emotional reactions to music are not independent processes, and that processing of the key of a piece of music may be necessary to perceiving the emotion it expresses.