CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)

Keegan Noronha

Project Number

34049

Project Title

In the Mood: Music Tonality and Its Effect on Happiness

Abstract

Objectives/Goals

The objective is to study the effect of musical tonality on the mood of the listener. My hypothesis is that if a tune is in a minor key, then it is perceived as sadder than if it were in a major key.

Methods/Materials

Two tunes, one major and one minor, were converted into the opposite tonality by changing a few notes. Using "Finale" music scripting software, digital (mp3) files were generated for the original and converted tunes, keeping tempo, rhythm, instruments and other variables constant. A web form was set up, with media objects to allow respondents to hear each tune online and indicate a happiness score on a scale of 1 to 7. Responses were invited by e-mail, and respondents were requested to circulate the URL by e-mail and Twitter.

Results

The major tunes scored much higher on the scale of happiness than the minor tunes. The converted tunes generated stronger feelings than the originals, i.e. the major tune converted to minor was sadder than the minor tune. The 85 invitations I sent out brought in more than 125 responses.

Conclusions/Discussion

Some music experts insist that minor keys on their own do not make music sad, and that many other factors such as tempo and rhythm work together. e.g. Middle Eastern and Gypsy dances are in minor keys. This study shows that tonality on its own does affect the mood of music, at least for the audience I reached. Tonality is used in advertising, e.g. in political advertising, to portray candidates as happy, and their opponents as dismal. It is important to understand how it works.

Summary Statement

This project uses a web survey to test the hypothesis that a tune in a major key sounds happier than a tune in a minor key.

Help Received

Advisor helped with ideas, showed me how to convert major to minor, and helped to set up web response system.