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The Influence of the Language Used in the Lyrics on How People Perceive the Emotions in Music

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Abstract: According to the existing research, the part of the brain in charge of language is also linked with musical functions. Besides, it is not a secret that music can influence language development in the human brain. However, there is seldom research on how language can influence the processing of musics. Here, research is designed to measure how the presence of language can alter the perception of music and, specifically, how lyrics (language) can affect how people perceive the emotions in the music. The scores given by the participants about how strong the emotions perceived (including positive to negative ones) in the music will be the operational definition.

Keywords: melody, lyrics, emotion

1. Introduction

Scientists have found that several parts of the human brain can share the same cognitive functions. For example, the experimenters have found that emotional and valuative processing overlap in the areas of the parietal, motor, and sensory cortex, which also process mathematics [1]. Recent findings found that music and speech cognitive functions have many aspects in common and that some neural modules are shared for speech and music [2]. For instance, musicians display stronger activations in the brain area related to language function than non-musicians, which implies using the same neural networks for music and language functions [3]. More detailed studies were done to test the hypothesis that music and language functions may share some of the same brain parts. For instance, the processing need of musical syntax (harmony) and language syntax interact in Broca's area in the left inferior frontal gyrus (without leading to music and language main effects) [4].

Besides, speech functions can benefit from music functions, which further proves the linkage between music and language: brief exposure to a Mozart sonata promotes short-term increases in spatial-reasoning abilities [5]; pre-schoolers can benefit from a program of musical training to enhance their phonological awareness [6]. Much more hypotheses and tests to prove them have been done than what is listed here.

However, there is seldom research on the emotional links between language and music. Also, most research focused on the influence from several perspectives of music to the perspectives of language. An experiment was conducted to directly test how language influences cognition toward music from an emotional aspect; specifically, how the lyrics affect the emotional perception of a melody will be tested.

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2. Hypothesis

The main target of the proposed study is to figure out whether language affects the emotional perception toward music, more specifically, whether the emotions people perceive from melody are influenced by their familiarity with language; thus, for the hypothesis of the proposed study, if participants are more familiar with the language used in the lyrics, they will perceive stronger feeling from music. On the contrary, if the test does not support the previous hypothesis, whether participants are more familiar with the language used in the lyrics, they will perceive the same feeling from music. If the hypothesis can be proved by the test, then the participant's familiarity with the language used in the lyrics was directly proportional to how they felt.

2.1. Participants

One hundred participants were selected randomly between 18 and 40 years old from Mandarin monolinguals and English monolinguals, no bilinguals.

2.2. Materials

Two sets of melodies, one composed by a Chinese composer and one composed by a US composer, should express happy feelings. 2 sets of lyrics for the melodies, one in Mandarin happy expression and one in English.

2.3. Procedure

Each subject hears each melody presented once, with either Mandarin or English, and either a happy or sad set of lyrics; whether a given melody is presented with happy or sad lyrics and with Mandarin or English lyrics will be counterbalanced across cultures. Each subject will hear 4 melodies, 2 of which are happy, 2 of which are in their native language. They will be divided into groups to do the 2 (Native language (Mandarin, English)) x 2(Country of the composer (Chinese, US)) x 2 (Language of lyrics (Mandarin, English)) x 1 (Valence of melody (Happy)) design. Each group will be required to hear one of that music. Every time participants hear the melody. They will be required to choose from the following options that can describe the feelings they think the people in the video are feeling: 1 represents very sad, 2 represents sad, 3 represents neutral, 4 represents happy, and 5 represents very happy. This experiment will only test people's reactions to positive melodies, so it can focus more on measuring the emotion rating rather than the impact on negative and positive. After that, the differences in positive emotion ratings as a function of whether each melody is presented with happy or sad lyrics and whether the speakers know the language of the lyrics or not could be tested.

3. Prediction

This experiment predicts that emotions people perceive from music are influenced by their familiarity with the language. The more familiar participants are with the language used in the lyrics, the stronger the feelings they will perceive. The experiment has 16 experimental groups, as each composer will compose two melodies that they consider positive. Chinese melodies are CHM1 and CHM2, and U.S. melodies are USM1 and USM2. Moreover, each melody is accompanied by four types of lyrics, including both positive and negative Chinese lyrics and both positive and negative U.S. lyrics.

When native melodies are accompanied by native language lyrics, the prediction is that positive lyrics will bring a higher positive emotion rating, as shown in Figure 1a, and negative lyrics will bring a lower positive emotion rating, as shown in Figure 1b. Differently, when melodies accompany

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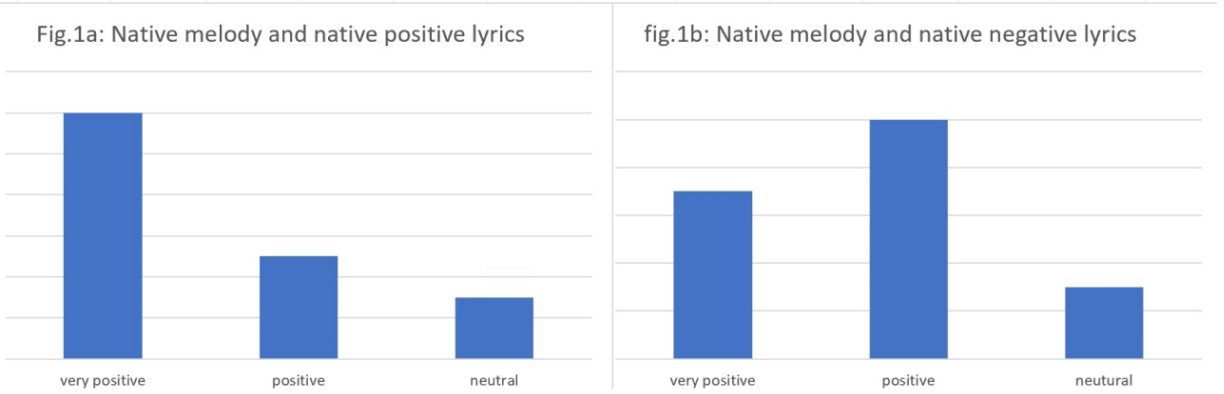
foreign language lyrics, positive and negative lyrics may bring similar outcomes, as participants cannot understand foreign languages.

It is also possible that even if participants don't understand the lyrics, they might perceive a positive emotion. For example, for those who receive native melodies and positive or negative foreign lyrics, the positive emotion rating may still be at a relatively high level, as shown in Figure 2a. Differently, for those who receive foreign melodies and foreign positive or negative lyrics, participants might gain positive emotion, but the rating is much lower, as shown in Figure 2b.



Note: Predictions of the proposed study (y-axis represents percentage of each rating)

Figure 1:(a)Native melodies and native positive lyrics, a higher positive emotion rating.(b)Native melodies and native negative lyrics, a lower positive emotion rating.

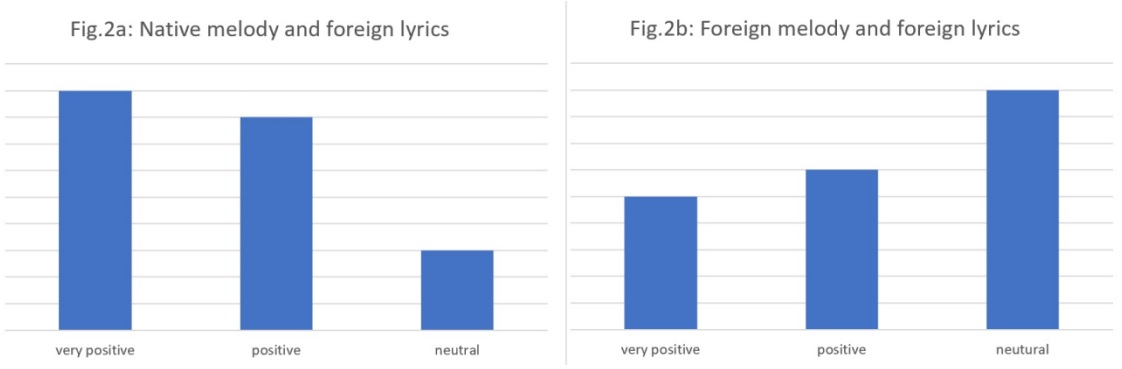


Figure 2:(a)Native melodies and foreign lyrics still bring a relatively high positive emotion rating.(b)Foreign melodies and lyrics bring a lower positive emotion rating.

4. Conclusion

If the results show that people obtain higher positive or negative emotion ratings while listening to native melodies accompanied by native language lyrics than those accompanied by foreign language lyrics, it means that emotions people perceive from music are influenced by their familiarity with the language.

Alternatively, if the results show that people obtain similar positive or negative emotion ratings while listening to native melodies accompanied by native language compared to those accompanied with foreign language lyrics, it means that people's emotions perceived from music are not be influenced by their familiarity with the language.

On the other hand, if the results support that people obtain higher positive or negative emotion ratings while listening to native melodies accompanied by a foreign language than foreign melodies

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accompanied by a foreign language, it means that emotions people perceive from music are influenced by their familiarity with melody.

The result of this study could help contribute to a better role for music in psychotherapy or even integrate music into psychotherapy. From this study, it can also be inferred what type of music people are most likely to be influenced by, and thus, psychotherapists can improve the treatment of specific ailments through music. In addition, by unveiling what kind of songs the public likes, this study can help composers make better-selling tunes catering to the public appetite, as their understanding of the public preference has a big impact on how well a song sells.

One imperfection of this study is that it is difficult to distinguish whether it is language or culture that truly influenced people's emotions perceived from music. People from different countries were chosen to participate in the experiment to make sure their native language is different, those from different countries largely have different cultures. The understanding of emotions and music may vary in different cultures, potentially influencing the experimental results. Further study can focus on whether culture influences the emotion that people perceive from music.

To add to that, more generalizable tests are needed. This experiment only tests differences between Western and Eastern cultures, specifically USA and Chinese cultures, to avoid possible obvious confounding variables across cultures. It is unclear what the result would be in other cultures, such as the ones from Japan, Korea, and Indonesia from Eastern countries, and Russia, Britain, and France from Western countries.

Besides, some confounding variables are hard to avoid. For example, people may have different musical familiarity - some may feel more sympathetic toward the same melody than others; therefore, the more sympathetic participants may rate the quiz with more extreme scores. It is hard to know if this incident affects the score. Moreover, testing a participant's sensitivity to be sympathetic when listening to a melody is expensive because experimenters may have to use expensive technological devices to detect the activity in the brain, such as EEG or fMRI. Future researchers may include this test if they follow the proposal of this work.

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All authors contributed equally to this work and should be considered co-first authors.

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