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The Influence of Music on Feelings

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Abstract. Music has been regarded as an effective tool to alleviate emotions, but there are different variables in music with distinct styles and characteristics, which can bring people a variety of feelings, and the effect of relieving feelings is also different. This study selects one of the variables to explore the impact of music speed on alleviating people's negative feelings. In the study, the main method of the research is an experiment, which is conducted by an experimenter and a participant in a relatively quiet place offline. There were a total of 50 participants in this experiment, of which 25 listened to the low-speed music and 25 listened to the high-speed music. The participants filled out a questionnaire containing demographic information and their feelings about four different emotions before and after listening to music. After analyzing the two quantitative methods of T-Test and ANOVA, the conclusions are that music can effectively improve people's three negative feelings of relaxation, irritation, and uneasiness, and the low-speed music is more relaxing than the high-speed music. In addition, age is not closely related to the degree of stress relief.

Keywords: Music speed, Emotional relief, Questionnaire

1. Introduction

This study's research question is the difference between the high-speed music and the low-speed music in alleviating negative feelings, systematically exploring the music speed relationship with people's emotions.

In our daily life, different tempos of music can trigger entirely different feelings. Smith and Lee confirmed that music therapy can significantly enhance personal emotional recovery, happiness, and employability, which means that music can improve people's feelings in real life [1]. Moreover, Yang et al. show that music does have an impact on human brain activity, and when brain activity is affected, people's emotions or feelings also change [2]. The resource also mentions that different musical rhythms may evoke different cognitive and emotional reactions. For example, high-speed music may be more likely to induce positive emotions (such as excitement and happiness), while low-speed music may tend to induce lower excitement (such as comfort and peace).

Therefore, this study sets the music speed as the only influencing factor to observe specific emotional reactions and reveal the differences in the degree of relieving emotions, and aims to clarify the following core issues: What is the impact of high-speed music and low-speed music on

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people's feelings respectively? Will different music speeds make people have different emotional reactions?

2. Method

In the experiment of Yang et al., the participants' emotional state was first recorded through physiological indicators [2]. Then, the participants were assigned to listen to a piece of high-speed or low-speed music. After the music, the experimenter measured their physiological indicators again to observe the changes of their emotions. Our study is similar to the above experimental structure - measuring current feelings, listening to the music, and then measuring feelings again - but using the Perceived Stress Scale to measure, not physiological indicators [3].

In addition, the music selection criteria of this experiment also corresponded to the resource. Yang et al. ensured that the music has a clear and uninterrupted rhythm, constant frequency, fewer harmony or melody changes, and a relatively low level of familiarity with the audience [2]. Therefore, we controlled the choice of musicians and chose the same musician, “Mozart” of the same type but different music as an experimental stimulus and excluded interfering factors such as the musician’s style, music type and other unrelated factors to affect the experimental results.

Our study is manipulated through questionnaires. The total number of participants was 50, with 25 participants listening to the low-speed music and 25 participants listening to the high-speed music. In order to reduce interference factors, the experiment was conducted face-to-face with an experimenter and a participant. The experimental process began with letting the participants complete the first half of the questionnaire by using questionnaire stars to fill in basic information, including age, gender and nationality and questions that were similar but in different forms before and after listening to music. Then, the experimenter chose a music from Relaxing Mozart for Sleeping (00:02:20-00:03:20) [4] and Symphony No.41 'Jupiter': Molto allegro (01:28:33-01:29:33) [5], and played the music on YouTube for a minute. After listening, the participants completed the remaining part of the questionnaire. The high or low scores could directly present the feelings of the participants, which was convenient for the subsequent comparison of the differences in the level of emotional relief.

In detail, the whole questionnaire and the measurement method were based on the Perceived Stress Scale, which was the official form of Psychological Self-Assessment, and its score range from zero to four [3]. The questionnaire was roughly divided into three parts: the collection of participants’ age, gender, and nationality, the self-assessment of their current feelings and their feelings after listening to the music. The last two parts of the questionnaire were cut from the original ten questions to four questions and paraphrased into four different kinds of feelings which were relaxation, confidence, irritation, and uneasiness [3]. In the first self-assessment part, questions were declarative sentences about negative feelings, and the higher the overall scores of the four feelings, the more negative emotions. Similarly, in the last part, the scores could be calculated in the same way by changing the wording to positive declarative sentences; a higher score exhibits a higher degree of improved emotions. Comparing the scores of these two parts of the questionnaire could help understand the degree of alleviation of the negative feelings of the participants.

3. Procedure

The whole experiment had one participant to take the questionnaire, and one experimenter instructed and played the music. The samples were collected from people at the cafeteria, academic building, and dormitory. The platform used for the questionnaire was Questionnaire Star. At the beginning of

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the experiment, participants were told to do an experiment about the relationship between music and people's feelings , and their information would not be leaked or used as anything else. Then the participant filled in their basic information, which was gender, age, and nationality. After that, the participant filled in the second part of the questionnaire, which was the first self-assessment table. Then, the experimenter played either the high-speed music and the low-speed music that lasted for 60 seconds. Subsequently, the experimenter instructed the person to fill in the speed of the music they listened to and finished the second self-assessment questionnaire.

4. Analysis

T-tests are used to compare the scores of each feeling before and after listening to music with the paired sample t-test, comparing the difference between high-speed and low-speed music for emotional relief with the independent sample t-test, and the one-way ANOVA is used to analyze the interaction effect of age and music.

First, we conducted a paired samples t-test. According to Table 1, rows from top to bottom represent four different feelings that are relaxation, confidence, irritation, and uneasiness [3]. By comparing the p-value in Table 2, the data shows that the feelings of uneasiness, relaxation, and irritation after and before the music both have a significant difference, since the p-values are less than 0.05. But the feeling of confidence has no significant change. So, the result is that music can effectively improve negative feelings except for confidence.

Next, our analysis used the independent samples t-test(Figure 1). We compared the data about the changes of each feeling in listening to the high-speed music and the low-speed music, respectively. According to Table 3, the outcome shows that there is a significant difference($p=0.044$) in the feeling of relaxation while listening to the low-speed music. However, participants basically had the same level of alleviation the other three feelings when listening to either high-speed music or low-speed music.

At last, we used one-way ANOVA to find whether age can be a variable that affects the level of stress relief in the case of listening to different types of music. The samples were categorized into four groups to compare they were people who are under 18 listened to low-speed music, people who were above 18 listened to low-speed music, people who were under 18 listened to high-speed music and people who were above 18 listened to high-speed music. Although Fisher's test assumes all groups have similar variance and Welch's test does not require equal variance between groups, the data from Table 4 exhibit that there is no significant difference between these groups since p-values are above the 0.05 threshold, manifesting that the interaction between music and age has no statistical effect on relaxation levels.

5. Conclusion

In conclusion, by calculating and comparing participants' questionnaire scores before and after listening to music, we found that the overall scores were higher after listening, indicating that music can effectively improve negative feelings. Secondly, when comparing the scores of participants who listened to the high-speed music with those who listened to the low-speed music, the analysis exhibits that low-speed music can make people feel more relaxed, with no significant differences in the other three feelings. Finally, after first dividing participants into two age groups based on whether they are above or below 18 years old, and then further distinguishing between the two music speeds within each age group, the data showed that the interaction between age and music speed had little effect on stress relief.

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Some limitations appeared in the study. The sample size was relatively small due to the short data collection period, which affected the generalization. Environmental factors such as noise had an impact on how long participants could immerse, which was to be calculated. Plus, participants' attitude and nervousness were not easy to control, and some were in a rush and provided with inaccurate data.

In the future, if we can conduct more in-depth research, will focus more on the impact of different Musical Instruments on emotional relief to discover the influence of other potential variables on people's emotions.

Acknowledgement

Yongshi Li, Xinyue Huang and Chengrui Zhang contributed equally to this work and should be considered co-first authors.

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Appendix

Table 1. Paired samples T-Test: comparison about the scores of each feelings before and after listening to the music

			Statistic	Df	P
4,I feel nervous and stressed. 我感到有压□.	6,I feel mentally relaxed at this moment. 此时此刻我感到精神放松.	Student's t	-3.79	49.0	<.001
4,I believe that things are under control. 我觉得事情尽在掌握	6,I believe that I can overcome difficulties. 我相信我能克服困难.	Student's t	-1.97	49.0	0.055
4,I feel irritated. 我感到很烦躁	6,Listening to the music helps me forget my troubles for a while. 听□乐让我暂时忘记了烦恼.	Student's t	-5.43	49.0	<.001
4,I feel restless. 我最近□神不宁	6,I feel calm. 我变得更冷静.	Student's t	-4.52	49.0	<.001

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Table 2. Paired samples T-Test: the average scores of participants' feelings

	N	Mean	Median	SD	SE
I feel nervous and stressed. 我感到有压□.	50	3.12	3.00	0.982	0139
I feel mentally relaxed at this moment. 此时此刻我感到精神放松.	50	3.80	4.00	0.990	0.140
I believe that things are under control. 我觉得事情尽在掌握	50	3.24	3.00	1.061	0.150
I believe that I can overcome difficulties. 我相信我能克服困难	50	3.58	4.00	1.108	0.157
I feel irritated. 我感到很烦躁.	50	2.40	2.00	1.161	0.164
Listening to the music helps me forget my troubles for a while. 听□乐让我暂时忘记了烦恼.	50	3.68	4.00	1.168	0.165
I feel restless. 我最近□神不宁.	50	2.44	2.00	1.146	0.162
I feel calm. 我变得更冷静.	50	3.50	4.00	1.093	0.155

Table 3. Independent samples T-Test: comparison about the degree of improving each feelings after listening to the high-speed music or the low-music

		statistic	df	p	Mean difference	SE difference
confidence	Student's t	-0.807	48.0	0.424	-0.280	0.347
relaxation	Student's t	-2.073	48.0	0.044	-0.720	0.347
irritation	Student's t	-1.370	48.0	0.177	-0.640	0.467
uneasiness	Student's t	-1.111	48.0	0.272	-0.520	0.468

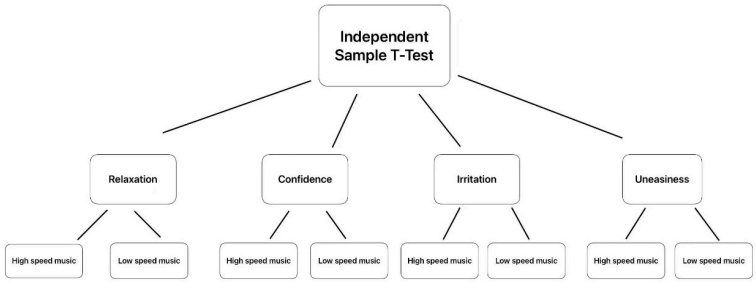

Figure 1. Comparative group classification in independent samples T-Test

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Table 4. One way ANOVA: comparison of stress relief levels at different music speeds

		F	df1	df2	p
Relax	Welch's	1.80	3	18.7	0.182
	Fisher's	2.13	3	46	0.109

Questionnaire

Research on the relationship between the tempo and experience

We want to explore the relationship between different music and the experience. Our data is for classroom experiments and is not intended for external use. The experiment lasts approximately 6 to 8 minutes in total.

我们想探索不同音乐与感受之间的关系.我们的数据是为了完成课堂实验,不存在对外使用.实验总共大概6-8分钟左右.

1.How old are you? 你的年龄是

O．Under18 (18岁以下)

O．18-25

O．25-30

O．Above 30 (30岁及以上)

2. Your gender? 你的性别是

O．Male男性

O．Female女性

O．Prefer not to say不愿透露

3. Your nationality你的国籍

4. To what extent do the following statements reflect your state of mind?(1 is completely non-compliant, and 5 is completely compliant.)

下列描述多大程度符合您的情况.(1是完全不符合,5是完全符合)

	1	2	3	4	5
I feel nervous and stressed. 我感到有压力.					
I believe that things are under control. 我觉得事情尽在掌握.					
I feel irritated. 我感到很烦躁.					
I feel restless. 我最近心神不宁.					

5. The speed of the music you are listening to is? 你听的音乐是哪种类型?

O. High speed music快节奏音乐

O. Low speed music慢节奏音乐

6. Please describe the feeling, rate the appropriateness of the following statements.(1 is completely non-compliant, and 5 is completely compliant.

下列描述多大程度符合您的感受.(1是完全不符合,5是完全符合)

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	1	2	3	4	5
I feel mentally relaxed at this moment. 此时此刻我感到精神放松.					
I feel calm. 我变得更冷静.					
Listening to the music helps me forget my troubles for a while. 听音乐让我暂时忘记了烦恼.					
I believe that I can overcome difficulties. 我相信我能克服困难.					