INFLUENCE OF CLASSICAL MUSIC ON THE PSYCHOLOGICAL STATE OF COLLEGE STUDENTS UNDER STRESS

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Abstract

The mental health of college students has become a major concern of the society. Against this backdrop, this paper aims to reveal the influence of classical music on the psychological state of college students under stress. A number of college students were selected from five universities in Beijing, China, and divided into three groups for a 2 month-long contrastive experiment. The first two groups were respectively exposed to two types of classical music, while the third group was taken as the control. Before and after the experiment, the electroencephalography (EEG) signals and psychological state of each subject were measured and evaluated, with the aid of Positive and Negative Affect Schedule (PANAS). The results show that different types of classical music have great differences in the improvement of the psychological state of college students under stress: the soothing classical music can effectively relieve the nervousness and promote the mental health, while the fast-paced classical music aggravates the nervousness and suppresses mental health. The research findings provide a reference for solving the mental health problems of college students.

Key words: Classical Music, Stress, College Students, Psychological State.

INTRODUCTION

In recent years, the death and violence of college students caused by psychological problems have showed a rapidly increasing trend, making college students become one of the important groups that are in urgent need of psychological guidance. Multiple research shows that the main factors causing excessive pressure and further mental health problems of college students are reflected in their school work, social communication, emotion, and employment, etc. In addition to violent incidents such as suicide or wounding others, college students who are under stress for a long time are more likely to perform behavioural characteristics such as inferiority, loneliness, jealousy, strong revenge, and difficulties in communication (Cochrane, 2010). After they enter the society, these behavioural characteristics are continuously strengthened, which is the root of many important social psychological problems. In general, stress is inevitable in the process of human growth. Therefore, the key to solving the mental health problems of college students under stress is not to eliminate various factors that lead to stress, but to enhance their ability of adjusting their own minds (Zentner & Eerola, 2010).

The role of music in regulating people’s psychological state has been valued by most researchers over years. In fact, the influence study of music on psychological regulation can be traced back to the musical psychology originated in the 19th century. Music psychology was founded by the German scientist Helmholtz, which regards the relationship between music and human psychological activities as research objects and contents (Groves, 1969). At present, many Western scholars have applied music to the study of emotion regulating and healthy psychology cultivation, and proved the
effectiveness of the methods advocated by music psychology (Scherer & Zentner, 2008). Furthermore, lots of scholars have studied the effects of different types of music on the psychological adjustment, and considered that the soothing and slow-paced music has a positive effect on relaxing emotions, while fast-paced music has little effect on regulating mental state, and even producing countereffects (Van Hoom, Le Veck, & French, 1989). On the basis of the above research, this paper focuses on studying the positive effect of classical music on the psychological state of college students under stress. It’s expected to improve the mental health of college students, and fill in the gap in domestic study for the influence of classical music on the psychological state.

MUSIC THERAPY AND MENTAL HEALTH

Music psychology is an important foundation for the study of the relationship between music therapy and mental health. Music can play a key role in shaping human psychology. Different styles of music can shape people with different personalities and affect their mental state (Sink, 1984). For instance, some scholars have focused on the influence of heavy metal music on human personality and psychology, finding that long-term listening to heavy metal music makes people more active and irritable, and more prone to take radical action when encountering problems (Zentner, Grandjean, & Scherer, 2008). Other studies have shown that soothing music can relax and stabilize people’s emotions more, and maintain them in a better mental state (Koelsch, 2015). In view of these empirical findings, some scholars designed experiments to explore the specific mechanisms, and found that music in shaping people’s emotions and psychology is related to both internal and external factors (Hay & Saffran, 2012). Internal factors include the age, personality characteristics of the person etc., and the external factors include the music features and so on.

For the research methods, there are two main ways to reflect the influence of music therapy on mental health. One is to use the mental health scales for examining the improvement of psychological state (Custodero, 2005); the main scales include the PANAS and the Beck Depression Inventory (BDI). In recent years, along with the development of other scientific methods, the mental health scales have rarely been used as a research method alone. However, it is often used to make mutual corroboration with other scientific methods for proving the authenticity of emotional and psychological conditions. In addition to the mental health scales, one of the more commonly used methods is the neurological method based on EEG analysis (Barry & Kochanska, 2010), specifically including functional magnetic resonance imaging (fMRI), positron emission tomography (PET), transcranial magnetic stimulation (TMS), event-related potential (ERP), and electroencephalogram (EEG). From a physics point of view, music is actually a regular mechanical wave which can stimulate the cerebral cortex, cause nervous system reflexes, and arouse human behaviour and psychic reflex. Therefore, this study is dominated by the neurological method based on EEG analysis, supplemented by the PANAS to support the research results. The whole logical relationship of the study is shown in Figure 1 below.

Figure 1. Research flow chart

EXPERIMENTAL DESIGN

Selection of experimental subjects

The main purpose of this paper is to explore the effect of classical music in China on the psychological state of college students under stress. Therefore, the experimental subjects involved both experimental groups and music.

In terms of the experimental group, the undergraduate students at five universities in Beijing were mainly selected as research objects. A total of 437 college students were recruited during the experiment. Considering that it takes a relatively long time to track and observe, the experimental period was set to two months. Subsequently, we randomly divided the 437 students into three groups (A/B/C), in which
group A and B are the experimental groups who were exposed to two different types of classical music respectively during the experiment, and C was the control group. In terms of music selection, the students in Group A are mainly exposed to soothing types of classical music such as *Spring on Snowy Mountain*, *Rhyme of Han River*, and *Mountain and Flowing Water*, while Group B students mainly listened to the fast-paced type of classical music such as *Iron Horse Sing* and *Ambush on All Sides*. At the same time, the exam was set as the stress environment in this paper, that is, the students were exposed to music regularly for 2 months before the final exam, and then their psychological state was investigated when the exam is approaching. Before the experiment, the psychological state of all students was evaluated first using the Beck Depression Inventory. Descriptive statistics on the basic status of the students tested are shown in Table 1 below.

<table>
<thead>
<tr>
<th></th>
<th>GROUP A</th>
<th>GROUP B</th>
<th>GROUP C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>19.2±1.7</td>
<td>18.6±2.0</td>
<td>19.4±1.1</td>
</tr>
<tr>
<td>Height(cm)</td>
<td>170.3±2.5</td>
<td>171.1±2.1</td>
<td>170.8±1.9</td>
</tr>
<tr>
<td>Years of Education</td>
<td>3.1±0.2</td>
<td>2.6±0.3</td>
<td>3.0±0.4</td>
</tr>
<tr>
<td>BDI score</td>
<td>71.3±5.6</td>
<td>73.8±4.4</td>
<td>72.1±3.5</td>
</tr>
</tbody>
</table>

**Table 1. Comparison of different groups**

**EEG experimental results**

Neurological studies have shown that fluctuations in psychological state can be identified from EEG. Small fluctuation of EEG indicates that the psychological state is relatively calm, that is, in a relatively healthy psychological state; large fluctuation of EEG indicates an unhealthy state of mind such as anxiety and depression. Furthermore, the beta $\beta$ wave in EEG can display the EEG active range. It’s also found that when the wave frequency of wave $\beta$ fluctuates in the range of 10-16Hz, it indicates the relax psychological state; when it fluctuates within the range of 16-25 Hz, it means the tense psychological state, but appropriately; when it exceeds 25Hz, it indicates excessive stress and poor mental condition (Barry & Kochanska, 2010).

(1) Experimental results of Group A subjects

Figure 2 below shows the EEG analysis results (averaged) of group A subjects before and after the experiment. It can be seen from the figure that before the experiment, the EEG wave frequency of the subjects was between 10-16Hz, indicating that the students were in a relaxed state and their mental health status was at a good level when there was still a long time before the exam; after listening to the soothing type of classical music for a period of time, the wave frequency of the students before the exam was generally between 12-18 Hz (the extreme value for some individuals is 9 Hz), indicating that the exam aggravates the student’s nervousness, but still in a reasonable fluctuation range, and they are in a relatively healthy psychological state.

Figure 2. EEG Analysis of group A

![Figure 2](image1.png)

(2) Experimental results of group B subjects

Figure 3 below shows the EEG analysis results of group B subjects before and after the experiment. Before the experiment, the EEG fluctuation frequency of the subjects was between 11 and 16 Hz, indicating that the students were in a relaxed state and the mental health status was at a good level when there was...
still a long time before the exam; after listening to the fast-paced type of classical music for a period of time, the fluctuation frequency of the students before the exam rose sharply to 25-35 Hz, indicating that the exam intensifies the student’s nervousness greatly, exceeding the reasonable range and the students are in an extremely nervous psychological state.

(3) Experimental results of group C subjects

**Figure 4. EEG Analysis of group C**

Figure 4 below shows the EEG analysis results of group C before and after the experiment. As the control group of this experiment, the college students of C group did not listen to any type of classical music, and their psychological changes before and after the exam can be regarded as the general situation of the college students. It can be found that the subject’s EEG fluctuation frequency was between 12-16 Hz, indicating that the students were in a relaxed state and their mental health status was at a good level when there was still a long time before the exam. When it’s closer to the exam, the EEG wave frequency of this group was between 18-28Hz, which is higher than that of the group A, but lower than group B, so the psychological state of these subjects was between moderate tension and hypertension.

**Positive and negative affect schedule**

Figure 5 below shows the PANAS scores of the three groups A, B and C before and after the experiment. For the A group, it can be clearly found that the scores don’t change significantly after the two-month experimental period; the average score was 74 points before the experiment, and slightly decreased to 72 points after the experiment, but this difference is not statistically significant. For group B, the scores of the PANAS were significantly different from those of group A; their average score was 75.
before the experiment, and decreased to 66 after the experiment; this difference is statistically significant. For group C, the results before and after the experiment were similar to those of group B; their average score before the experiment was 72 points, and after the experiment it was 68 points; this difference was statistically significant.

The results of the PANAS above are basically consistent with those of the EEG experiment, that is, after exposure to the soothing type of classical music, the psychological state of the group A under stress (when the exam is approaching) have improved; after exposure to fast-paced type classical music, the psychological state of Group B under stress did not improve, and even became worse in some degree.

**CONCLUSIONS**

Taking the college students in China as the research objects, this paper explores the practical effect of classical music on improving the mental health of college students under stress. On the one hand, it expands the research scope of music psychology, and on the other hand, it provides ideas for solving the poor mental condition of college students in China under stress. The main conclusions are as follows:

1. Music can improve people’s mental health. Musical psychotherapy also plays an increasingly important role under the guidance of music psychology. However, different types of music have different effects on psychological conditions;

2. The soothing type of classical music can significantly improve mental conditions. Long-term exposure to soothing type of classical music can help to appropriately relieve the tension of college students under stress, which is conducive to their development of mental health;

3. The fast-paced type of classical music is not good to improving mental state. Long-term exposure to fast-paced type classical music can amplify the anxiety level of college students under stress, which is not conducive to their development of mental health.

**REFERENCES**


