LETTER TO THE EDITOR

Behavior of Different Characters in Animated Films Based on Ecological Environment

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In order to study the cognitive activities of the viewer and the manipulation of the movie to the brain, the analyses method of the behavior of different characters in animated movies is proposed. The experiment scheme and the implementation process are designed, and the animated film ISO sniper is selected as the experimental material, the behavior of different characters in an animated film is analyzed and studied. Through analysis, it can be seen that the brain behavior of the viewers has obvious changes during the whole process of watching, and the fluctuations show different stages with the development of the video content. Through the cognitive experiment, it is known that the brain behavior intensity is associated with memory and emotion. Using the analysis of the auditory aspect, the sound of the combination of the soundtrack and the natural sound has the stronger influence on the auditory brain behavior, and the purely natural sound has the weaker influence on it.

I Introduction

Olga I. Efimova, Aleksandr V. Grinenko, Natalia V. Kalinina, Dmitriy V. Miroshkin, Yuliya V. Bazhdanova, Aleksey A. Oshchepkov, Svetlana A. Ivleva published "Personality Hardiness as a Factor Determining the Interaction of a Person with the Environment (Psychological and Ecological Aspects)" on Issue:107, Pages: 563-569, Article No: e107063, Year :2019, in the article, Modern civilization is characterized by rapid changes, making increased demands on the person in terms of his adaptation to the surrounding society. In the article the authors substantiate the importance of studying the psychological aspects of the interdisciplinary problem of the person's interaction with the environment. Interest in this problem is explained, among other things, by the aggravation of the global environmental problems of mankind, the need for psychological support to realize the concept of "sustainable development". The authors consider the polysemy of the concept "ecology", which is widely used in current psychological discourse. It is asserted that the correlation of the context of foreign and Russian research will contribute to a more active involvement of psychologists in solving real problems of a person's interaction with the environment (Efimova et al. 2019).

Interdisciplinary transformation is one of the important trends in the research of contemporary animated film (Yang and Qi 2017). In the past few years, animated films research has fully interacted with disciplines such as philosophy, history and psychology, and has thus rapidly expanded its theoretical system. Nowadays, the introduction of ecological environment has opened up the more scientific and empirical path for the study of animated films. In animated films research, ecological environment can use the advanced brain imaging

technology to clearly present the brains' behavior of the audience during the viewing, help evaluate the audience's acceptance behavior, and scientifically verify the film theory (Zhou 2017). The combination of animated film and ecological environment has important significance both in theory and in practice.

II Methods

The experiment consists of two parts: 1. The fMRI is used to scan the viewer's brain behavior to study the consistency of brain behavior of different audiences while watching the same animated film; 2. As the supplement to the previous experiment, the viewers' memory and emotional response of the previous experimental clips are discussed (Meng et al. 2015, Liu et al. 2017), through the method of image recognition.

Functional magnetic resonance imaging

The experimental material consists of two videos, one of which is the BELL TREE murder in the ISO sniper, with a total length of 5 minutes and 41 seconds, which is the main research object of this experiment. The initial and ending lens is shown in Figure 1; the other segment is the natural scene clip, which is taken as the control group of the animated film segment, taken outside the art building of Beijing Normal University, and is also the video, with the same length, width and duration. The example picture is shown in Figure 2.

Figure 1. "ISO sniper" fragment start and end lens

Figure 2. Natural scene video clip

During the experiment, the subjects are lying on the fMRI scanner to watch the above two videos. In addition, in

order to eliminate the error caused by the sequence of the two video playbacks, the order of the videos is balanced.

The test is performed in the form of picture recognition (Merlet et al. 2016), which randomly presented the screenshots and un-viewed pictures that the subject had watched in the video, asking the subject to judge whether the target picture is viewed.

In this experiment, the old picture comes from the video clip of ISO sniper in the previous brain imaging experiment. The method is obtained by intercepting every 5 seconds. After eliminating the same picture, 32 pictures of the experiment are finally obtained, as shown in Fig. 3A. In order to ensure that the two sets of images are homogeneous, the new images that have not been seen are also taken from the screenshots of the film ISO sniper, but they have not appeared in the previous experiment, a total of 16 images, as shown in Figure 4.

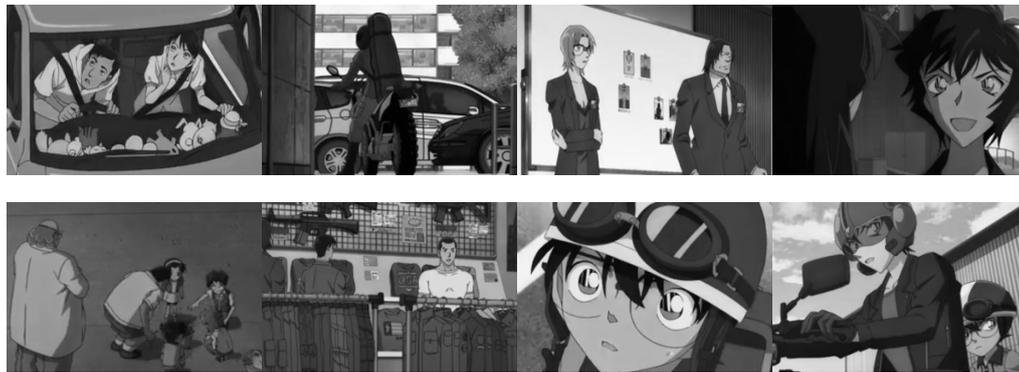**Figure 3. Examples of experimental fragment screenshots**

Figure 4. Examples of non experimental fragment screenshots

After E-PRIME programming, the test materials are presented on a computer (Capozzi et al. 2016), requiring the subject to press the button. After presenting the picture, the subject first judges whether it has appeared in the previous brain imaging experimental film clip. If it appears, press "1", otherwise press "0".

After the test, the subject's emotional intensity after seeing this picture is 1-5 self-assessments, one is no response, and five was very strong.

III Results

Analysis of behavioral intensity in the behavioral consistency region of the brain
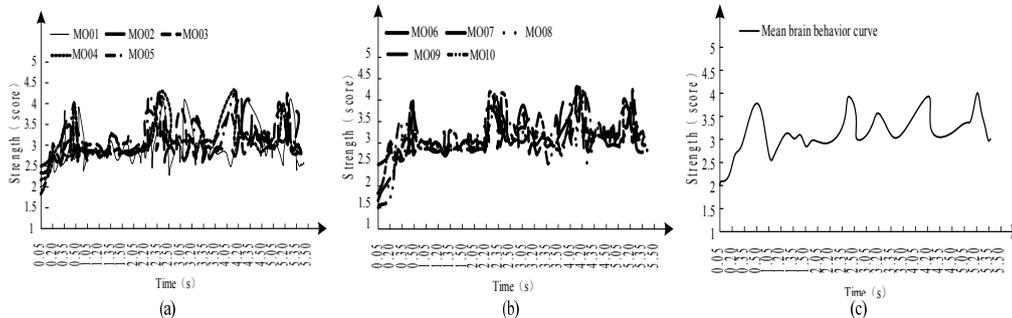

Figure 5. The schematic diagram of brain behavior of 10 subjects

Figure 5 shows the average signal fluctuation of the brain behavior consistency region when the subject views the animated film clip. The horizontal axis is the experimental animation movie clip playback time, the vertical axis is the consistency behavior intensity, and larger values on the vertical axis indicate higher consistency behavior.

IV Discussions

As shown in the analysis, all the curves of brain behavior have similar trends, and they correspond to the content of the animated film, showing the certain regularity. According to the time, characteristics and curve trend of the high point of brain behavior intensity, it can be divided into four parts, and they correspond to the four paragraphs of the animated film. The change in the curve is not disorganized.

It should be noted here that the division of the animated film passages is based on the brain imaging scan results. It is based on the behavior of the brain when the subject is watching. This paragraph division is not the only criterion for the analysis of this segment. The study shows the consistency of the viewer's brain behavior with the animated film content, which also validates the director's superb narrative technique.

Papez proposed that the emotional circuit includes the hypothalamus, the anterior thalamic nucleus, the hippocampus and the cingulated cortex. The concept of the limbic system is proposed by MacLean, who believes that the hippocampus and amygdala play the extremely important role in the emotional experience.

However, there are also inconsistencies between brain imaging, memory and emotional outcomes, which are mainly reflected in the following two aspects:

First, the audience's response to the close-up of the last paragraph varies at different levels. In the experiments of memory and emotion, this group of close-ups had high recognition accuracy and high emotional scores, but in brain imaging data, higher-intensity brain behaviors do not appear. There is no doubt that this is not caused by the decline in attractiveness. These close-ups really attract the attention of the audience to be remembered and also cause emotional reactions.

But the brain imaging data has this reaction, probably because the cognitive input of the audience at this moment is not here, but when the dangerous event ends, the tension is released.

They begin to move to the more advanced state of mind, resulting in the decrease in brain behavior.

Secondly, regarding the sneak peek part at the beginning of the film, as the most suspenseful scene in the whole section, brain imaging and memory are highly consistent, but the emotional score is at a low level. This suspense becomes more pure and attractive after removing the emotional effects such as fear.

V Conclusions

The influence of the animated film on the brain behavior of the character is verified from the correlation between the intensity of the behavior of the brain behavior consistent region and the content of the animated film. In this experiment, the subject's brain behavior shows changes consistent with the content of the film, and the stages it exhibited correspond to several paragraphs of the film.

When watching the animated film, the use of animated film types and techniques can affect the size of the manipulation, and to a certain extent, it also determines the size of the attraction. That is, the better the handling is, the more attractive the animated film is. Research shows consistency can predict program ratings.

This experiment is the first attempt to combine animated film with cognitive neural technology. Through the study of the classic animated film ISO sniper, the manipulation of the animated film to the brain has been verified again, and the content of the film and the Hitchcock suspense have been reanalyzed for the first time from the cognitive perspective.

The results show that in the process of watching the film, the brain behavior of the subjects is not only highly consistent, but also the trend of change is consistent with the content of the animated film.

Acknowledgements

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