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The Effect of Induced Happiness on the Perception of Facial Expressions and Their Intensity

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ABSTRACT. *The research aims to investigate the effect of induced emotions on people's perceptions of facial expressions and their intensity, with 30 participants involved and a special method was used to test the results. Based on the analysis of the questionnaire, the result suggests that there is a significant difference in the perception of facial expression. People's perception of facial expressions become more positive when they are experiencing happiness. They also tend to think the positive facial expressions to be more intense and vice versa.*

KEYWORDS: *Perception of facial expressions, Induced emotions, Intensity of facial expressions, Priming*

1. Introduction

In daily life, people often experience different forms of positive emotions, such as happiness and surprise. And when they do, they may find it easier to communicate with others and to even forgive others. It will be interesting to test out whether there is a significant difference in the perception of emotions when people are experiencing different emotions. Researches on the perceptions of facial expressions largely focused on subliminal priming of the faces. In the research conducted by Wen Li (2008), surprise faces were shown to the participants after they were exposed to 30ms of happy or fearful faces. The participants could not recognize the prime faces that flashed by, but their affective rating of the surprise faces demonstrated a significant difference.[1] From Michio Nomura (2004), there were differences in amygdala activities in the participants' brains after they were exposed to 35ms of angry face primes.[2] Priming effects on the perception of facial expressions is also proved to be long-lasting. In the study conducted by Timothy D. Sweeny (2009), participants were tested 24hrs after they looked at surprise faces primed by 30ms fearful, happy and neutral faces, and their memory for the surprise faces improved when they are primed by happy faces.[3] In these studies, short-duration faces were used as subliminal primes and were proved to be effective in changing people's perceptions of facial expressions. In most researches, emotions were used as primes to evaluate its effect on behaviors, such as the tendency to drive recklessly.[4] The purpose of this experiment is to determine the effect of induced happiness on the perception of facial expression. It is different from previous researches since this experiment uses a 5-minute video clip to induce positive emotions among the participants instead of using faces as subliminal primes. The participants were well aware that they were happy, whereas, in previous researches, the participants did not feel specific emotions by looking at the primes. The hypothesis is that after watching the funny video, the subjects will consider the facial expressions to be generally more positive.

2. Methods

30 participants from a local high school were randomly chosen and given a questionnaire. The questionnaire consists of 2 parts: the experiment section and the control section. The experiment section contains a funny 5-min video clip and 7 pictures with different emotions, including anger, disgust, fear, happiness, sadness, and 2 neutrals. The control section contains a 1-min neutral video and 7 other pictures with the same categories of emotions as in the experiment section. All the pictures were downloaded from FACES database. After each picture, there are 2 questions attached: (1) What type of emotion do you think this image conceives? (2) How intense is the emotion conceived above? The answers provided for question 1 were anger, sadness, disgust, happiness, surprise, fear, and neutral, which are the seven types of basic human emotions.[2] For question 2, the participants rated the intensity on a scale from 1 to 10, 1 being the least intense. The 30 participants were given either form A of the questionnaire or form B. The only difference is the sectional orders, which helps to get rid of the order effect. Next, these data were collected and analyzed by a special method. The answers in question 1 were divided into 3 groups: (a) positive,

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including happiness and surprise; (b) negative, including anger, sadness, disgust, and fear; and (c) neutral. If the participants chose an emotion that belongs to the positive category, they would get 1 point. Otherwise, they would get -1 or 0 points for choosing negative or neutral emotions, respectively. The score the participants got in question 1 is multiplied by the intensity level in question 2, and the products were the final scores for each picture. The reason for using this calculation is that induced happiness may affect the participants' answers to question 1 and 2 to different extents. This means that a participant's answer in the two sections may be unchanged for one but drastically different for the other, if so, it may not reflect the changes the induced happiness has on the participants. A combined score can most accurately reflect the participants' overall perception of the facial expressions. At last, the average score for each section is calculated in this way and the T-test was used to determine whether the difference is significant.

3. Results

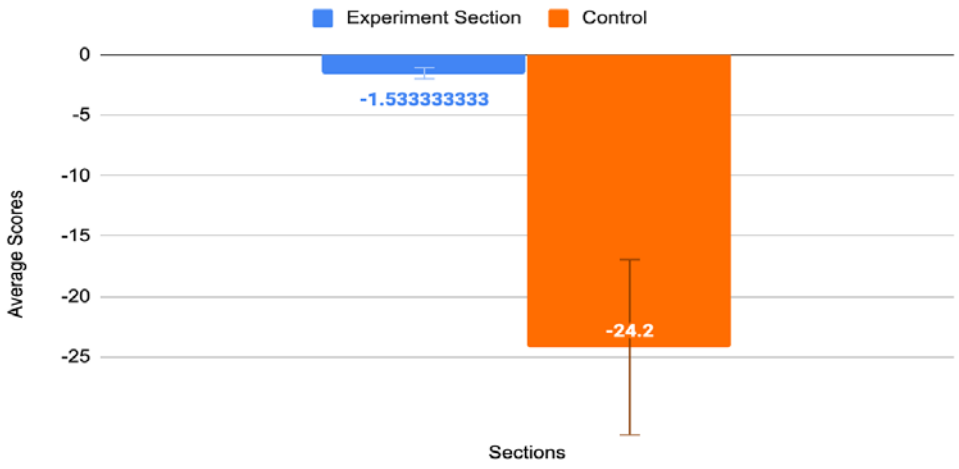

Fig.1 Average Score in 2 Groups

As shown in Figure 1, the average score is -1.5333 for the experimental section and -24.2 for the control section. The standard error bars do not overlap. P<0.001, which means the difference between the experimental and control section is significant.

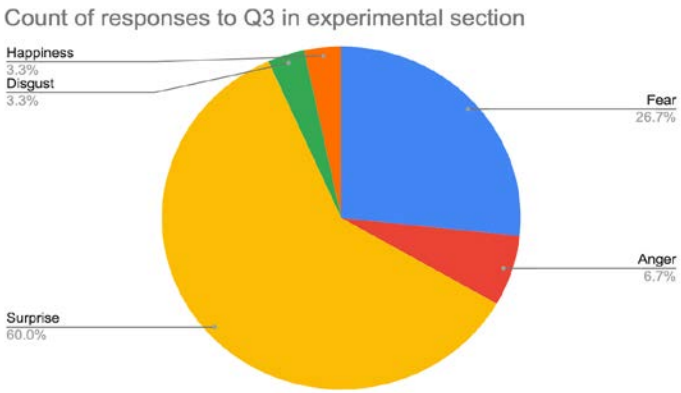

Fig.2 Responses to Question 3 in Experimental Section

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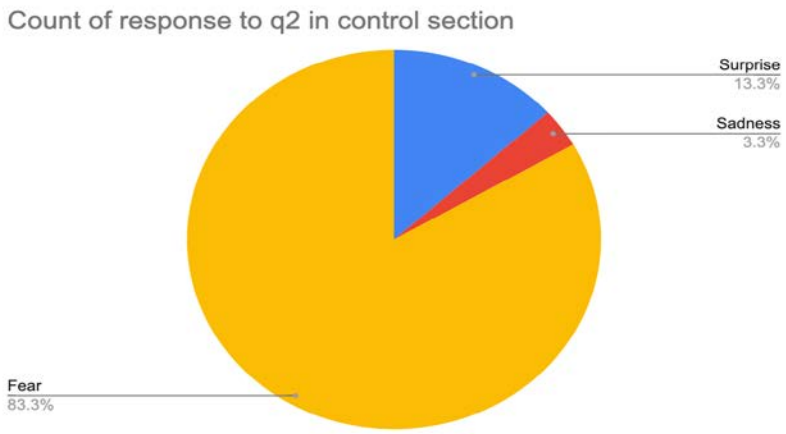

Fig.3 Responses to Question 2 in Control Section

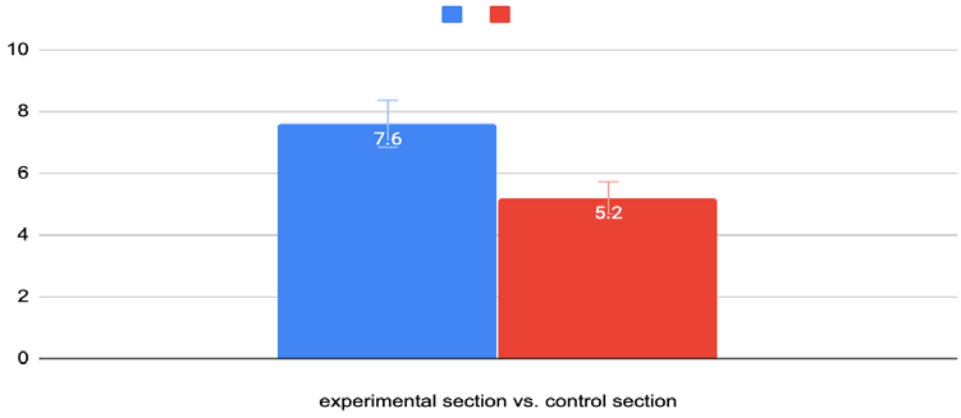

Fig.4 Perceived Intensity of Happiness in Experimental and Control Sections

4. Discussions and Conclusion

The results show that there is a significant difference in the level of scoring after watching the funny video and the neutral video. Compared to the control section, the score in the experimental section is extremely low, which supports the hypothesis that the happiness induced by the funny video makes people consider the given facial expressions to be significantly more positive. That is to say, induced happiness has a significant impact on the participants' interpretations of facial expressions and people rate clearly positive facial expressions to be more intense. There are three tendencies can explain the large differences between the two sections. Firstly, they tend to choose more positive emotion choices in the experimental section. For example, the participants tended to choose "surprise" instead of "fear" after watching the funny video, as shown in Figure 2 and Figure 3. Secondly, they tend to rate the positive emotions to be more intense in the experimental section. For instance, 96% of them described the happy facial expression as "happiness", however, the participants gave out an intensity rating of 7.6 and 5.2 in the experimental and control sections, respectively, as shown in Figure 4. Thirdly, if given a facial picture with clear negative emotion, their intensity ratings tend to be lower in the experimental section, which means they will describe the negative emotions as less intense after watching the funny video.

This experiment reveals the changes in people's perceptions of facial expressions under induced happiness. It proves that induced emotions, alongside still faces, can also act as primes that influence the recognition of facial

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expressions. It is possible that the induced emotion gives the participants subconscious cues and expectations, affecting their judgments of the precedent expressions. The results of the experiment can explain the reasons why smiles and positive emotion can usually resolve conflicts. However, there are some limitations. The study only focuses on high schoolers, who are not representative of the whole population. The questionnaire used can also be biased. The order of the questions may have a priming effect, affecting the way people rate their answers. The models for the faces consist of different ages, genders, and attractiveness, which is another factor that may affect the scoring. In the future, researchers can test this theory on different populations, using a better-designed questionnaire with the same model and equal length video clips in both sections. Researches can further focus on the biological and chemical changes inside the brain that may be responsible for the changes in perceptions of facial expressions.

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