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The Influence of the Value Changes on the Perception of Costume Colour

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Abstract: The purpose of this study was to investigate the relationship between perceptual attributes of costume colour and the colour value changes. In this study, "gorgeous" and "plain" as words for description of human colour emotion were used, and costume picture samples and colour piece samples of same colours with 40 hues and 9 levels of values were evaluated on emotion variables by 32 subjects in the behavioural trials. The results showed that the colours of medium values have the most gorgeous emotion, and presented sensitivity to subjects during the evaluation of "gorgeousness", the RT (response time) of costume is less than the RT of colour pieces, it is easier to make judgment on colour emotion in costume, while the lower-value-colour and the higher-value-colour reduce the effect on "gorgeous" emotion.

Keywords: colour perceptual, colour emotion, reaction time, colour value, behavioral, costume

1. Introduction

As a principal factor of costume perception, colour plays an important role in people's psychological suggestion, emotional expression and image building, and it also can produce great influence on apparel design, production and sales. Colour may influence human perceptions or emotions, for example, some colours may make one happy, while other colours may make one depressed. These feelings, evoked by either colours or colour combinations, are called colour emotions. However, the relationship between colour and emotion is very complex, because colour emotion may be influenced by subjects' gender, as well as their cultural backgrounds. The value of colour is the lightness or darkness of colour, light colours are achieved by different amounts of white, and dark colours are achieved by the addition of black, so the different values can also induce dissimilar emotions among people. From the literature, some researches were conducted to categorize human emotions induced by colours and to find their relationship with colour perception, such as cross-cultural colour emotion, colour emotions for single colours and so on [1] [2], and the other studies on colour preference [3]. However, few studies involved the evaluation of costume colour on emotion, and if any, most were carried out through questionnaires. As a result, these studies can just obtain the result, but can't evaluate subjects' perceptual course of colours. In this paper, the psychology and behavioural testing software were applied to evaluate the influence of colour value on the costume perception, especially to analyze the emotional changes evoked by different colour value and the process of perceptual judgment. This study has three main objectives as follows:

1. To explore the influence of different colour value on the perception of costume and evaluate the differences of colour piece and similar coloured costume in order to explore the characteristics of costume colour perception;
2. To explore the influence of different colour value on the time of judgment of costume perception;
3. To testify the perceptual differences of gender on the colour.

2. Method

2.1 Apparatus and Stimuli

The stimuli were presented on a Pentium desktop computer with a 17-in monitor set at a refresh rate of 85Hz in a dimmed room, the distance between participant and monitor was about 70cm, and the visual angle was 12.3°×4.9°, using E-Prime 2.0 (Psychology Software Tools, Inc.) [4]. Costume pictures with different colour value and two sensory words of 'gorgeous' and 'plain' were regarded as stimuli. Pictures were produced using the Photoshop procedure. Forty basic colours were selected evenly from the 360° colour wheel with the interval of 9°. Then, according

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to the hue/saturation pattern, every basic colour was changed into 9 sub-colours with different values, in which the fifth colour was considered as the new basic colour. Finally, all these colours were presented in a costume and a rectangular piece whose area was similar to that of the costume are shown in Figure 1 and Figure 2. All the colours are based on the RGB colour mode. In this way, there were 720 images used as stimuli.

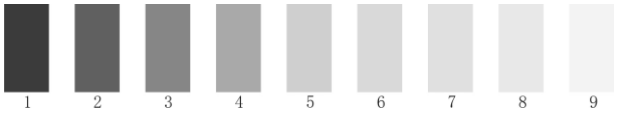

Figure 1 Samples of value changes for colour piece

Figure 2 Samples of value changes for costume

2.2 Participants

Thirty two undergraduate students from Soochow University (16 males, 16 females, and aged 20-23) participated in the experiment, whose majors in studies have nothing to do with clothing, and all of the participants were from urban areas, there were no participants from small towns or rural areas with diverse cultural backgrounds. All subjects had normal or corrected-to normal vision and were unaware of the purpose of the experiments.

2.3 Procedure Design

The experiment consisted of two blocks, one block was evaluating the colour piece and the other block was evaluating the costume colour. Each trial has only one sensory word and one colour image, and it began with the presentation of a fixation cross in the centre of the screen for 100ms. After 400ms interval, a sensory word **"**gorgeous" or "plain" was displayed for 300 ms on a uniform white background, and then followed a colour image which randomly appeared, after that, the participants must evaluate the emotion of the colour of image. The subjects pressed "Z" in keyboard if he thinks the colour emotion is in accordance with the sensory word, otherwise, he must press "/" in keyboard. These responses including RT (reaction time) were collected via keyboard.Before the experiment, a block of 10 trial images was provided to get the participants acquainted with the manipulative method and the short display times. After that phase, an instruction page informing the participants that they are done with the first phase and that the second phase is about to begin. The stimuli and the procedure in Phase 2 were identical to those of Phase 1.

3. Results and Discussion

3.1 Value Changes Influence on the Perception

The influence of the value changes on the perception of piece colour and costume colour were analyzed, as shown in Figures 3 and 4. They presented a rule that emotion of "gorgeous" gradually weakened after enhancing according to value level changes from 1 to 9, the lower value colours and the higher value colours have weaker "gorgeous" emotions, but the medium value colours have stronger sense of "gorgeous", i.e, the colours of medium value have the most gorgeous emotion. Especially, the colour value level ranging from 5 to 6 have the strongest sense of gorgeous emotion because these two colours are most pure without adding white or black, directly selected from the colour wheel.

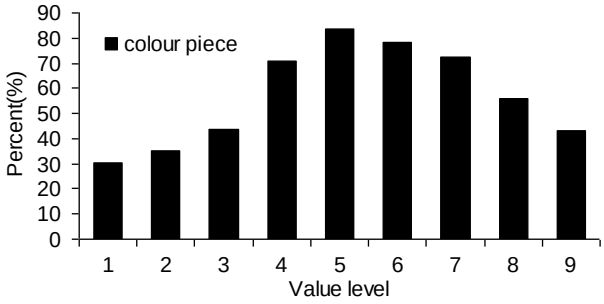

Figure 3 Influence of value changes on the perception of colour piece

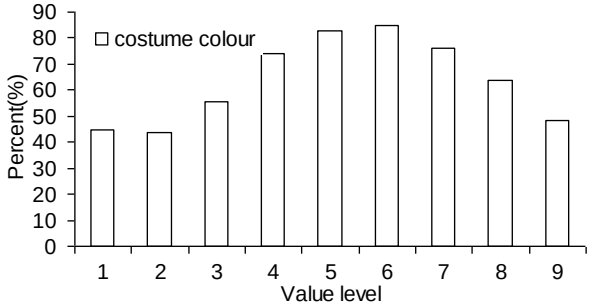

Figure 4 Influence of value changes on the perception of costume colour