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# The Influence of Clothing Dividing Line Direction on Perceived Height

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***Abstract*—Clothing dividing line is an important element of style performance. It not only has the modelling function, but also has the decoration function. The difference in the direction of the dividing line will often produce visual deviation. In this study, behavioral experiments were conducted to test the impact of visual perception bias on the high perception of clothing based on dividing line direction. The results show that the direction of the dividing line has a significant effect on the perceived height. Regardless of the number of dividing lines, the perceived height score of the oblique dividing line was the highest.**

***Key words: Clothing dividing line direction; Perceived bias; Perceived height***

## I. INTRODUCTION

Numerous Scholars have focused on the functional and decorative aspects of clothing dividing lines. On the one hand, in terms of functional research, they mainly explored the application of dividing lines to make clothing more suitable or to meet the internal comfortable functions such as human body structure and sports posture. On the other hand, they mainly focused on the aesthetics of clothing dividing lines, which can make clothes look more beautiful, including the beauty of clothing modeling and creating perfect body proportions [1]. Using the clothing structural design, Wang divided sportswear into pieces in accordance with the various parts of the body area. In addition, a functional area segmentation design method is also proposed for the design of skin-tight sports clothing dividing line [2]. Through the research on the waist line of the skirt, Li found that the skirt whose upper and lower body ratio was closer to the gold ratio could give wearer a visual perception bias of high, and the more the waist was tightened, the more it could highlight the height and thinness of the waist [3]. Peter Thompson has shown that horizontal clothing makes people taller and slimmer than vertical clothing. The study of Hazel L. Rabert found that horizontal lines give wearer the perceptual bias of getting wider and fatter, while vertical lines give people the perceptual bias of getting thinner and longer. Sometimes in order to improve wearing effect, we can use a variety of visual perception deviation, however, visual perception deviation is within a certain range, and was restricted by objective conditions, such as different individuals wear the clothing with same width stripes, not all of them are thin [4].

In fashion design, the visual perception deviation of the dividing line can make the body image change. For example, the use of darts makes the wearer's shoulder visually narrow. The horizontal line is used in the dress and it cuts off longitudinal line and can alleviate the visual perception with tall and thin. Those with narrow shoulders can be designed bubble sleeves or lamb leg sleeves to form a perception of widening the shoulders [5]. Therefore, it is vital to study the influence of dividing line on perceived height. In the current study, women's dress of different lengths was selected and the dividing line was designed in different directions on it. The behavioral test was used to explore the influence of clothing dividing line direction on perceived height.

## II. EXPERIMENT

### A. *Subjects*

Undergraduate students at Soochow University in China (32 males, 32 females, aged in 20-26) participated in the experiment. All subjects were right-handed with normal vision (or corrected vision), and have not done similar experiment.

### B. *Stimuli*

In this experiment, the white dress on a model was selected as the stimuli. In ClO3D-Modelist three-dimensional clothing software, three body shapes of models were selected and the direction of the dividing line was designed as horizontal, vertical, and oblique. There were 45 pictures used as the stimuli (shown in Fig. 1).

Fig. 1 Picture example of direction change of dividing line

### C. *Experimental program design*

In this experiment, E-prime2.0 software was used for programming. The stimulus image was displayed on a 15.6-inch monitor. The subjects were arranged in a quiet room, the distance between participant and monitor was

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about 60cm, and the visual angle was 10.5°×4.8°. Before the formal experiment, the subjects conducted practice experiments to familiarize themselves with the process. The instruction was as follows: conduct highly perceptual evaluation on the following pictures. Press "Z" on the left and "/" on the right to start the experiment.

Each trial had only one word and one color image, and it began with the presentation of a fixed cross in the center of the screen for 100ms, reminding the subjects to start the experiment. After that there was a grey screen time of 400ms. Then the stimulus pictures were presented randomly. Before the next stimulus target appeared, there was a stimulus interval of 500-800ms. At this moment, the participants must evaluate the perceived height, the subjects pressed “Z” in keyboard if he thought the left model is higher, otherwise, he should press “/” in keyboard.

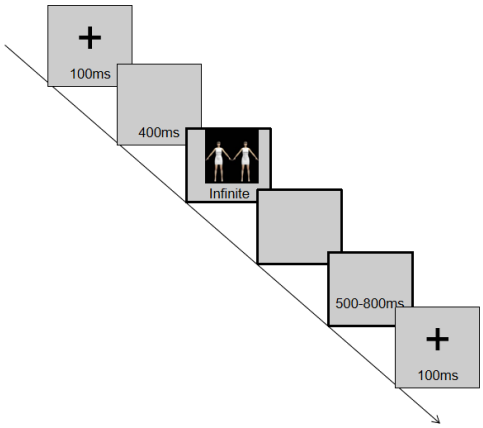


Fig. 2 Sequence of stimulus presentation

## D. RESULTS

a) *Evaluation for thin body*

Fig. 3 shows the evaluation results of perceived height in thin bodies in the direction of divider. The data shows that the perceived height score of oblique dividing line is the highest regardless of the number of dividers. When the number of dividing lines is 2, there is little change among the three directions of dividing lines. When the number of dividing lines is 1, the score is similar in both horizontal and vertical, and the oblique score is the highest. The data show that direction has influence on perceived height, among which oblique has the most obvious influence on perceived height; vertical has obvious influence on perceived height when the number of dividing lines is small; horizontal has obvious influence on perceived height when the number of dividing lines is large. One-way ANOVA found that there was a significant effect on the direction of the dividing line, F=15.244, P =0.000, indicating that the direction of the dividing line had a significant influence on the perceived height in the thin body. Further research shows that the main effects of horizontal, vertical and oblique effects are significant.

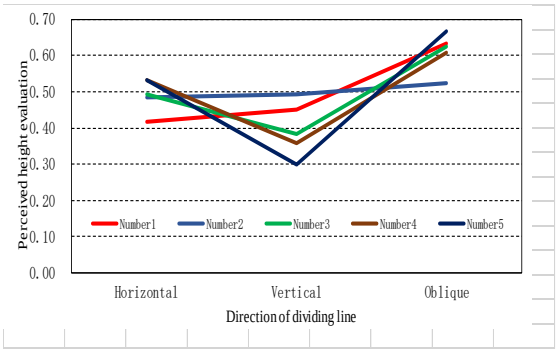


Fig. 3 The effect of the direction of the dividing line on the perception of height based on thin body

b) *Evaluation for standard body*

Fig. 4 shows the evaluation results of perceived height in the standard body in the direction of divider. The data shows that no matter which kind of divider the number is, the perceived height score of the oblique divider is the highest, while the score of the diagonal divider is the highest, followed by the horizontal score and the lowest vertical score when the number of dividers is 3, 4 and 5. When the number of dividing lines is 1 and 2, the score changes little in the horizontal and vertical, and gets the highest score in the oblique. The data show that direction has influence on perceived height, among which oblique has the most obvious influence on perceived height; vertical has obvious influence on perceived height when the number of dividing lines is small; horizontal has obvious influence on perceived height when the number of dividing lines is large. According to one-way ANOVA, there is a significant effect on the direction of the divider, F=25.165, P =0.000. It can be seen that the direction of the divider has a significant influence on the perceived height in the standard body.

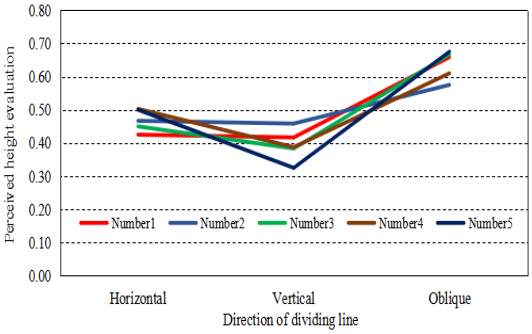


Fig. 4 The effect of the direction of the dividing line on the perception of height based on standard body

c) *Fat body evaluation results*

Fig. 5 shows the evaluation results of perceived height in obese people in the direction of dividing lines. The data shows that when the number of dividing lines is 1 and 2, the score is highest in the oblique direction, followed by the vertical direction, and lowest in the horizontal direction. When the number of secant lines is 3, among the three directions of secant lines, the oblique score is the highest, followed by the horizontal score, and the vertical score is the

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lowest, but the difference between the horizontal and vertical directions is not big. Line number 4 and 5 are inclined to the highest score, transverse times, vertical scored lowest score, and the three difference is bigger, the data show that direction to influence perceived height, oblique impact on perceived height is most obvious among them, when the line number less vertical height effect on perception, line number of transverse obvious influence on perceived height. One-way ANOVA found that there was a significant effect on the direction of the divider, F=10.505, P =0.000. It can be seen that the direction of the divider has also a significant influence on the perceived height in fat bodies.

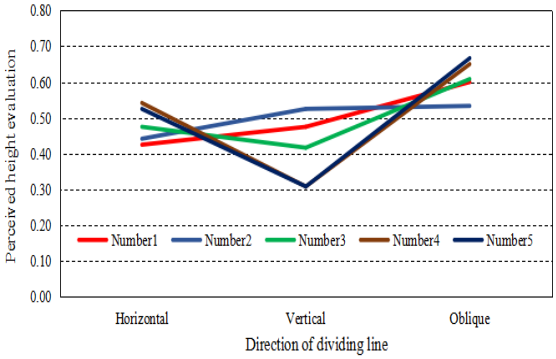


Figure 4 The effect of the direction of the dividing line on the perception of height based on fat body

## III. CONCLUSION

In this study, the body shape of wearer were used as mediating factors, and the three-dimensional dress pictures were used as stimulus material to systematically explore the influence of the number and direction of dividing lines on perceived height through behavioral experiments, and the conclusion is that the direction of dividing lines has a significant influence on perceived height. The score of oblique dividing lines is the highest regardless of the number of dividing lines and body shape of the wearer.

## REFERENCES

[1] Bai Huiqun. Aesthetic research on clothing color combination based on behavior and ERP [D]. Soochow University, 2017.

[2] Wang Qi. Research on the design of split-line of tight-fitting sports clothing [D]. Beijing Institute of Clothing Technology, 2013.

[3] Li Caiyun. The effect of skirt length, waist height and waist width on visual height [J]. Progress in Textile Technology, 2016.

[4] Wang Fang, Chen Feirong. On the application of optical illusion in fashion design [J]. Journal of Xingtai Vocational and Technical College, 2012 (02): 108-110.

[5] Han Chuyue. The use of stripes in dresses [D].

[6] Lawless H T, Heymann H. Sensory Evaluation of Food[J]. Cornell Hospitality quarterly, 2010, 84(4):664-668.

[7] Cartier R , Rytz A , Angèle L, et al. Sorting procedure as an alternative to quantitative descriptive analysis to obtain a product sensory map[J]. Food Quality and Preference, 2006, 17(7-8):0-571.

[8] Krumbein A , Peters P , Bernhard B. Flavour compounds and a quantitative descriptive analysis of tomatoes of different cultivars in short-term stor-age[J]. Postharvest Biology and Technology, 2004, 32(1):15-28.

[9] Campo E , Ballester J , Langlois J , etal. Comparison of conventional descriptive analysis and a citation frequency-based descriptive method for odor profiling: An application to Burgundy Pinot noir wines[J]. Food Quality& Preference, 2010, 21(1):0-55.