# The Relation between Fashion Pattern and Somatotype Based on Aesthetic Judgments

**Mawei Zhou, Xiaofeng Jiang, Huiqun Bai**

*Abstract*—**This study focused on the relationship between fashion pattern and somatotype. The various type and size patterns of clothing worn by a model with different body sizes were tested on aesthetic judgments by behavioral experiment. Results suggested that the thin somatotype is the most beautiful no matter the type and size of patterns, the clothing with figurative patterns is more beautiful than that with abstract patterns, and that the small-size patterns were more attractive. There was no significant difference of task difficulties in aesthetic judgments.**

***Index Terms— Fashion design; Abstract pattern; Figurative pattern; Size of pattern; Somatotype***

## I. INTRODUCTION

Clothing, linked to appearance management [1, 2], is a visual image integrated the colors, styles, patterns and context, so it undoubtedly contributes to a perception of beauty or ugliness, as well as arouses aesthetic emotions. There is a close relation between clothing and wearers [3]. Objectively, clothing beauty comes from three crucial aspects: clothing including patterns, wearer including body sizes and wear contexts [4].

Fashion pattern refers to the decorative figures used in clothing and its accessories. Despite its subordination, fashion pattern is an indispensable ingredient of garment aesthetic. According to the visual effects in clothing, patterns are mainly divided into two major types, namely figurative pattern and abstract pattern. The former is clearly derived from real object sources, and has the essential features from the shape, color and texture of natural objects [5, 6], whereas the latter neant non-representational is extracted from a large number of figurative objects by the association. Two kinds of pattern can trigger different aesthetic experience in the application on clothing and contexts. Figurative pattern can arouse individual's spiritual pleasure with specific and vivid images, whereas the abstract pattern crossed likeness and unlikeness to objects can cause more romantic charm.

Patterns can also be divided into large, medium and small ones in the light of the size of its content materials. Among them, small-sized patterns can come into being simple but elegant, wearers with those can make an impression of quiet, gentle, ease and casual [7,8]. Large-sized patterns are images with a larger shape, which can perform the details, so those patterns are very lively and imaginative. At the same time, medium-sized patterns are combined the advantages of small-sized and large-sized ones, which morphology can be clearly displayed, and gives the viewers a sense of simplicity [9-11].

Somatotype is one of the key factors of fashion behavior. It is the reason why the somatotype can not be ignored in the various influences on the beauty of clothing. The standard somatotype is rare, and most of wearers have the more or less imperfection in their body sizes. Over time, the "ideal" female body has developed into one who is a very slim. It is not uncommon to find women of all ages evaluating their self-worth in terms of physical attractiveness, while comparing their body size to the "ideal" ones [12]. The result of such comparison contributes to individuals expressing dissatisfaction with their physical appearances. Negative appearance perceptions can lead to greatly diminished mental and physical health for an individual [13]. Persisting aesthetic dissatisfaction may result in a variety of negative consequences, such as lowered self-esteem, increased depression, social anxiety, and disordered eating behavior [14, 15]. It is very important to improve individual's satisfaction of their body image by the clothing pattern.

Although links between body size and pattern clothing aesthetic may seem apparent, most of literature had only a discussion theoretically, in fact little empirical work has been conducted on this topic. In addition the conclusions were not identical. Song, for example, held the opinion that thinner wearers worn clothing with large-size patterns were more beautiful, while fatter wearers with abstract and small-size patterns were more attractive [16]. Wang also believed that the fatter wearers should choose the clothes with abstract and small-size patterns [17]. Li, however, argued that the thinner wearers can add beauty by choosing clothes with more followers and stripe patterns, On the contrary, the fatter wearers look more charming wearing clothes with small-size patterns [18]. Therefore, the purpose of the present study is to explore the aesthetic judgments caused by body sizes and patterns of clothing, the results can be provided for fashion designers to make clothing suitable for customers with different somatotypes. Our main objectives are followings:

(1) Aesthetic judgments of different body-sized individuals wearing clothes with abstract and figurative patterns;

(2) Aesthetic judgments of different body-sized individuals wearing clothes with large, medium and small patterns respectively;

(3) The difficulty during the aesthetic judgments.

## II. EXPERIMENTS

### A. *Stimulus Materials*

We chose a picture of a model with medium somatotype wearing white dress, and the picture was modified into fat somatotype and thin somatotype respectively by Photoshop software. There were 20 abstract patterns and 20 figurative patterns selected by experts from 100 patterns, all these

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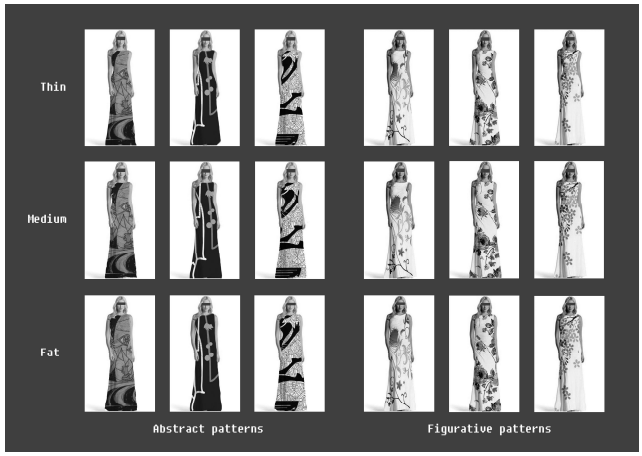
patterns were achromatic in order to reduce the influence of colors. Then they again were modified into small-sized ones and large-sized ones. Finally these patterns were added to the white clothing with three somatotypes. The height of all images was modified into 150mm, and the images were 100 pixels/inch. In this way, we got a total of 180 pictures (shown in Fig. 1).

Fig. 1: Clothing samples of three somatotypes with abstract and figurative patterns




### B. *Subjects*

48 right-handed undergraduates (18 males, 30 females, and aged 20-23 years) were engaged in the experiment. All participants had normal or corrected-to normal vision and were tested individually without similar experiments before.

### C. *Experimental Procedure*

Before the experiments, subjects' personal information needed to be recorded. The experiment was engaged using E-prime software on a PC. The participants seated in front of a computer in a soundproof lab, at a distance of 80cm from the computer screen. Each trial began with a screen centered fixation cross presented in black against a white screen for 100ms. Subsequently, a blank screen appeared for 400ms. Then, the pictures were randomly presented for 500ms. The subjects had to make a rapid response when that pictures appeared by pressing a button. Pressing "5" means very beautiful, pressing "4" means beautiful, pressing "3" means neutral, pressing "2" means ugly, and pressing "1" means very ugly. Before the experiments, participants performed a training task for familiarization with the task.

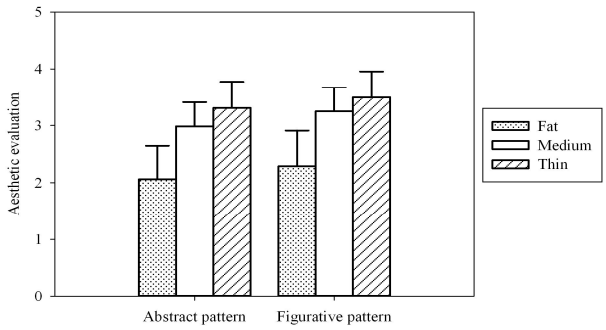
## III. Results

The data was integrated by E-studio and analyzed by SPSS17.0 software.

### A. *Pattern Types and Somatotypes*

A two-way repeated measure ANOVA for aesthetic evaluation was engaged. Results demonstrated that there was a significant main effects of somatotype [F= 121.102, p= 0.000] and pattern type [F= 25.936, p= 0.000], indicating that somatotype and pattern type were closely associated with aesthetic judgments. Fig. 2 presented that the thin somatotype (M=3.399□SEM=0.062) gained a higher scores than others and it meant that the thin somatotype was the most beautiful, followed by medium (M=3.116 □ SEM=0.056) and fat somatotype (M=2.174 □ SEM=0.084) respectively. For pattern type, the figurative patterns (M=3.009□SEM=0.054) were much more beautiful than the abstract ones (M=2.784□ SEM=0.054) (shown in Fig. 2).

Fig. 2: Mean (M) and standard deviation (SD) for aesthetic judgments on pattern types and somatotypes




The data for all somatotypes was analyzed by independent samples t-test. Results demonstrated that there was a remarkable difference of scores in the medium-sized somatotype (as shown table 1).

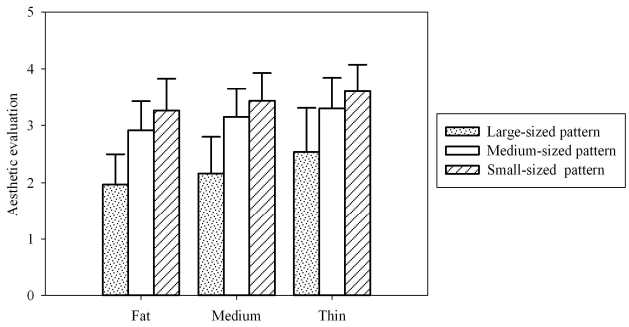
Table 1: T-test of aesthetic judgments on pattern types from different body size

| Patterns | Fat | | Medium | | Thin | |
|---|---|---|---|---|---|---|
| | t | p | t | p | t | p |
| Abstract, Figurative | -1.830 | 0.070 | -3.056 | 0.003 | -1.970 | 0.052 |

### B. *Pattern Sizes and Somatotypes*

Results revealed a main effect for pattern size [F=16.677, p=0.000] and somatotype [F=0.012, p=0.028]. The data indicated some obvious distinctions in aesthetic judgments between pattern sizes and somatotype. By comparing the aesthetic scores of different sizes of patterns, it was shown that the small-sized patterns (M=3.143, SEM=0.753) (SEM means Standard Error of Mean) is more beautiful than the medium-sized patterns (M=2.913, SEM=0.769), which is also more beautiful than the large-sized patterns (M=2.713, SEM=0.764) no matter what the somatotypes. Fig. 3 was a comparison of aesthetic judgments of different somatotypes. It was shown that the thin somatotype (M = 3.427, SEM = 0.780) is more beautiful than the medium somatotype (M = 3.120, SEM = 0.536) and the fat somatotype (M = 2.224, SEM = 0.689) no matter what the pattern sizes (shown in Fig. 3).

Fig. 3: Mean (M) and standard deviation (SD) for aesthetic judgments on pattern sizes and somatotypes



The data for all somatotype was analyzed by least significant difference (LSD). Multiple comparisons among pattern sizes were submitted to SLD (as shown table 2). The result was demonstrated that there were a significant differences of beauty existed among the two different size patterns. So Pattern size was closely associated with aesthetic judgments.

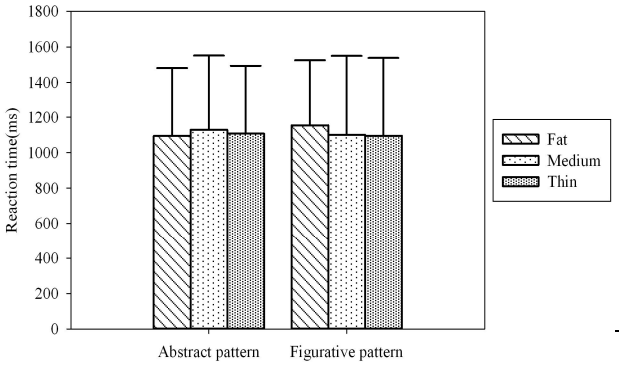
Table 2: LSD multiple comparisons on aesthetic judgments of the pattern sizes

| | Pattern size(I) | Pattern size(J) | Mean difference (I-J) | Sig. |
|---|---|---|---|---|
| LSD | large | Medium | -.200* | 0.027 |
| | | Small | -.429* | 0.000 |
| | medium | large | .200* | 0.027 |
| | | small | -.229* | 0.011 |
| | small | large | .429* | 0.000 |
| | | medium | .229* | 0.011 |

*: The mean difference is significant at the .05 level.

### C. *Reaction Times of Pattern Types and Somatotypes*

There was no significant main effect for pattern type [F=0.305, p= 0.583] and somatotype [F=0.337, p = 0.648] in reaction times (RTs) and the present results showed a poor relationship among RTs of the thin somatotype (M=1101.508, SEM=59.277), the medium somatotype (M=1114.917, SEM=62.109) and the fat somatotype (M=1125.114, SEM=53.695). Compared with the response times of figurative patterns (M =1110.308, SEM =54.859), those of the abstract patterns were even longer (M =1117.385, SEM =57.912). The data also illustrated the interaction effect




between somatotype and pattern type (shown in Fig. 4).

Fig. 4: Mean (M) and standard deviation (SD) of RTs spent on aesthetic judgments for fashion pattern types and somatotypes

The data for somatotypes were also analyzed by independent-samples t-test. Results demonstrated that there were no significant differences of RTs in all somatotype. So pattern type was not associated with the difficulty of aesthetic judgments (as shown table 3).

Table 3: T-test of aesthetic judgments on pattern types from different body sizes

| Patterns | Fat | | Medium | | Thin | |
|---|---|---|---|---|---|---|
| | t | p | t | p | t | p |
| Abstract, Figurative | -0.783 | 0.436 | 0.308 | 0.759 | 0.141 | 0.888 |

### D. *Reaction Times of Pattern sizes and Somatotypes*

As shown in Fig. 5, the aesthetic RTs for the medium somatotype (M=1068.090 □ SEM=47.880) were a little shorter than those of the thin somatotype (M=1090.276□ SEM=51.128) and those of the fat somatotype (M=1098.791 □ SEM=54.157). However, there was no significant difference among RTs for somatotype [F= 0.754, p = 0.425]. The ANOVA revealed a significant main effect for pattern sizes [F=21.320, p=0.000] and it was shown that RTs of large-sized patterns (M=1130.613 □ SEM=51.060) were longer than that of medium-sized patterns (M=1083.001□ SEM=47.419) and small-sized patterns (M=1043.543 □ SEM=49.956). Besides, the interaction effect between somatotype and pattern sizes had been found.

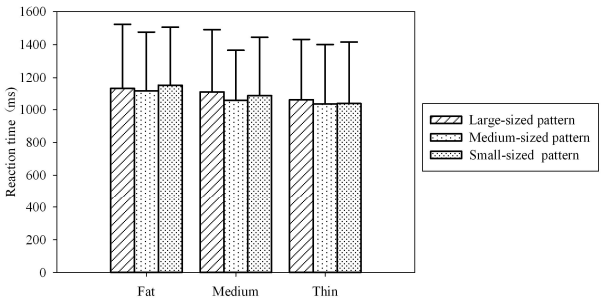



Fig. 5: Mean (M) and standard deviation (SD) of RTs spent on aesthetic judgments for fashion pattern sizes and somatotypes

The data for all somatotype was also analyzed by LSD. Multiple comparisons among pattern size were submitted to SLD (as shown table 4). The result was demonstrated that there was a significant differences of RTs existed among the the large-sized patterns and the small-sized patterns. But there was not a significant difference of RTs existed among the large-sized patterns and the medium-sized patterns as was the small-sized patterns and the medium-sized patterns. So there was not a significant difference of RTs existed among different pattern size. Pattern size was not associated with RTs.

Table 4: LSD multiple comparisons on RTs of the pattern sizes

| | Pattern size(I) | Pattern size(J) | Mean difference (I-J) | Sig. |
|---|---|---|---|---|
| LSD | large | Medium | 47.638 | 0.266 |
| | | Small | 87.020* | 0.043 |
| | medium | large | -47.638 | 0.266 |
| | | small | 39.381 | 0.358 |
| | small | large | -87.020* | 0.043 |
| | | medium | -39.381 | 0.358 |

*: The mean difference is significant at the .05 level.

## IV. DISCUSSION

The goal of this study was to examine the relation between wearer's somatotype and pattern of clothing by aesthetic judgment. Our results showed that the clothing with figurative patterns was more beautiful than that with abstract patterns, suggesting that human figurative pattern preference may be

universal, and this liking may comes from life experience of human in nature, especially in prehistory [19, 20]. For example, flowers acted as pattern may be universally liked because they are so appealing when grow on trees and other plants. It is important to note that although early humans were much preferred pattern from real objects, with the change of fashion consciousness and the impact of postmodernism trend, nowadays, human preference is altering. The abstract clothing pattern, being fancy and simple, seems to become more and more popular [21]. Abstract patterns not only include textures and forms, but also have an inherent relation to other arts, such as novelty and creativity, which have drawn people's attention [22-25].

Our results also revealed that the clothing with small-sized patterns were the most beautiful. Small-sized patterns are plain but elegant and have not strong impact on individual visual, so human universally prefer small-sized patterns. The results also manifested that there is a link between somatotype of wearer and clothing pattern, the thin somatotypes had the inherent wearing advantages and that the fat somatotypes go with small-sized pattern clothing, which was consistent with many conclusions of scholars. However some people believed that the fat somatotypes wearing the clothes with abstract patterns were more beautiful than those wearing clothes with figurative patterns, and that the thin somatotypes should wear the clothes with large-size patterns. It is contrary to our conclusions.

The current study also had some limitations that a special perfection could not be achieved during modifying somatotypes by Photoshop, which might affect the results to some extent. Furthermore the participants selected for experiments were not universal. Despite the limitations, this experiment not only verified some of previous research results, but also studied innovatively the effect of pattern types, sizes and somatotype on clothing aesthetic. As a result, more persuasive conclusions were derived by experiment, which would play a certain driving role for research on clothing design and production in the future.

## V. CONCLUSION

Our investigation has revealed several findings:

(1) In terms of the pattern types, no matter what somatotype wearing the clothing of the figurative patterns is more beautiful than that of the abstract patterns;

(2) In terms of pattern sizes, the small-size patterns are more beautiful than the medium-size patterns, which is also more beautiful than the large-size patterns no matter what the somatotypes.

(3) The thin somatotypes have the inherent wearing advantages, followed by the medium somatotypes and the fat somatotypes respectively.

(4) There was no significant difference of task difficulties in aesthetic judgments

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