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Study on Optimal Lapel Collar Female Suits Based on Psychological Recognitions of Customers

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Abstract: A behavioral test based on cognitive psychology and Kansei engineering was done in this research, trying to find the optimal lapel collar female suits for consumers. Pictures of different lapel collar female suits are drawn as samples for the test, 64 college students who were 23 years old on average were tested by E-Prime and their behavioral data were collected, then SPSS16.0 was used for data analysis of variance, Finally, a style of lapel collar was found to be both most liked and most professional, which can be used as a reference for manufacturers in the development of the female suits.

Key words: Cognitive psychology, Kansei Engineering, female suits, lapel collar

INTRODUCTION

Female suit, as a kind of business wear, has played an important role in shaping competent, confident, mature professional image for women. As living standards improving, people's requirements to aesthetic appearance of female suits also have raised higher and higher. Collar is the visual center connecting the head and body, which has a significant influence on the overall appearance of the clothing, as well as the aesthetic and external quality of the finished garment (Zhang *et al.*, 2008)

The modern female suits tends to be more relaxed and casual, consequently, the collar also appeared to a variety of changes, but the most widely used collar in Female suits is the classic collar, especially in formal business occasions, which is called the suit collar. Suit collar belongs to lapel collar and its structure is composed of roll collar and lapel together (Liu, 2008). Same female suits with different lapel collar, the overall shape shows different visual aesthetic. This paper aims to find the optimal lapel collar female suits from consumers' point of view.

THEORETICAL BACKGROUNDS

Cognitive psychology and E-prime: The rise of cognitive psychology is in the mid-1950s in the West, it is a psychology thought which studies human's higher mental processes such as perception, representation, memory, thinking and language cognitive processes (Wang, 2011). With the development of technology, there have been many experimental cognitive psychology

computer systems and E-prime is one of them. E-prime is a globally recognized psychological experiments design software program, covering experimental generation, millisecond precision data collection and preliminary analysis and other functions, which greatly simplifies the work of researchers.

Kansei Engineering: Kansei engineering originated in Japan, it is a science which transfers the consumer's emotional awareness into product design elements. Its research framework is first to extract the product design elements, select evaluation vocabulary of Kansei simultaneously, then use questionnaire, semantic difference method, fuzzy mathematics or other methods to comprehensive analysis and ultimately get qualitative design language for product development, or establish a mathematical model to provide a reference for the product design.

RESEARCH FRAME

Before this study, members of the group have found the best length, waist and hem combinations for the optimal basic style of female suits (Fig. 1), this article attempts to find best collar based on this, research frame is shown in Fig. 2.

EXPERIMENTAL PREPARATIONS

Design elements of collar: As Fig. 3 shows, lapel collar is constituted by many factors, such as the break point position, carved mouth shape, gorge line height and lapel



Fig. 1: Optimal basic style of female suit

step, but consider all these factors will increase complexity of the study and there are also certain links among them, so we can extract a few key elements for the study. In this study, collar design elements are summarized as neck depth, gorge line position and lapel step:

- Neck depth is determined by break point position. Light neck or deep neck will appeal sight moving up or down, which also affected the part exposed outside of the shirt worn in and the number of buttons
- Gorge line position affects the proportion of lapel and roll collar, thus forming different collar type, for instance, with higher gorge line and a larger proportion of lapel, a carrying collar formed; with lower gorge line and a smaller proportion of the lapel, a sagging collar formed (Lu, 2010)
- Lapel step, has a direct impact on the area and sense volume of roll collar and lapel, which is also very important to overall collar shape

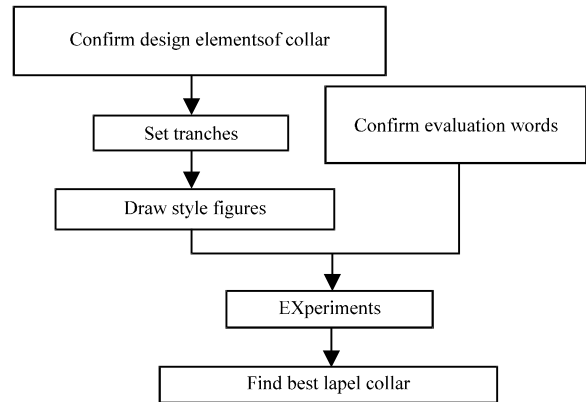


Fig. 2: Research frame

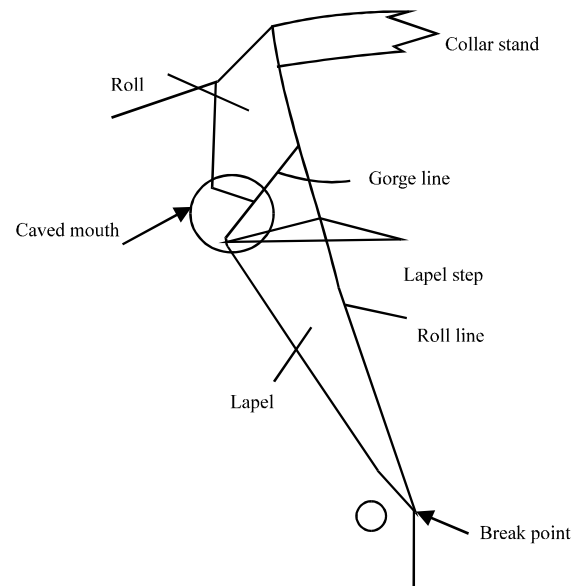


Fig. 3: Constitution of lapel collar

As these three elements confirmed, the approximate shape of lapel collar also will determined. It should be noted here that, although the carved mouth shape also affects aesthetic of collar, too much elements may result in too long experiment time, subjects prone to fatigue, thus affecting the accuracy of the experiment, as a result, it was not chosen as one of the changing elements, which was illustrated as semi cut-away collar with collar angle of 90° when we drawing sample figures.

Set tranches for each element: After three elements are determined, to identify variation of each element and set tranches for them, which can simplify experiment and make the research more feasible:

- Neck depth: female suits' neck depth is generally opened to the waist line, while ranging between the

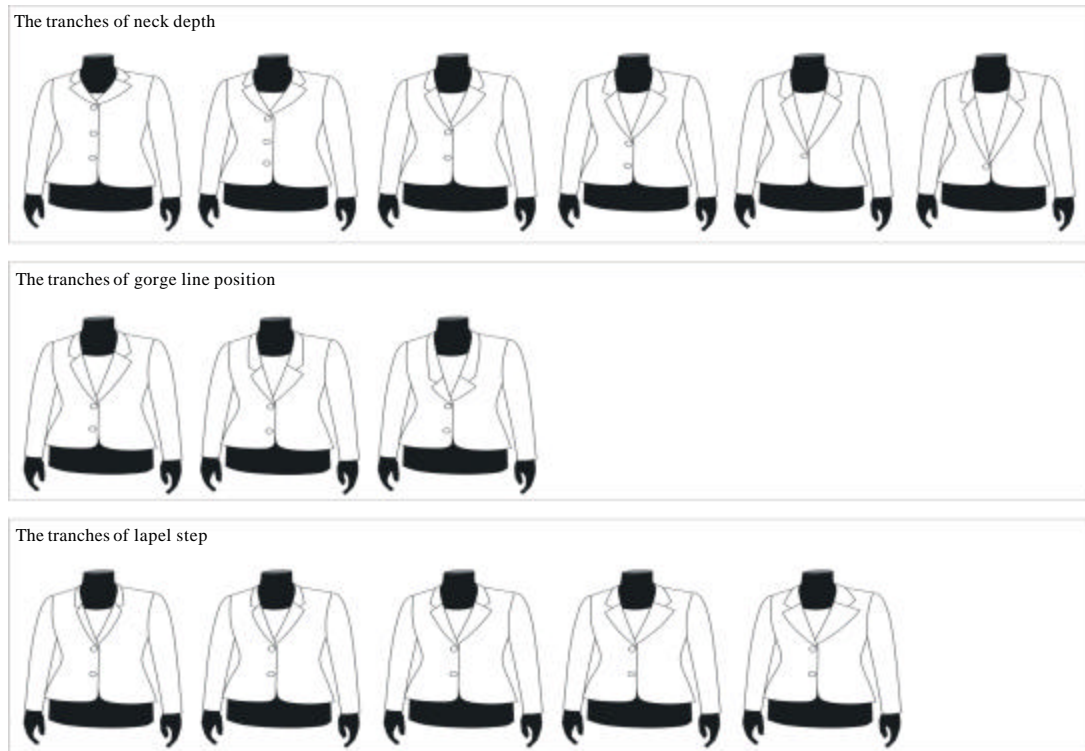


Fig. 4: Tranches of three elements

basic neck depth (about 1/12 of chest) and the bottom cycloid, so neck depth was initially set into three tranches, (basic neck depth line-Waist Line)/2 is the first tranche, the waist line is the second tranche and (waist line-bottom cycloid)/2 is the third tranche

- Gorge line position: For the beauty of proportion and visual coordination, gorge line should be positioned according to the changes of neck depth. Thus gorge line was preliminarily set into five tranches, they are 1/4, 1/3, 1/2, 2/3 and 3/4 of neck depth
- Lapel step: The width of lapel is set into three tranches, which is increased by 1/4 shoulder width

Then a preliminary experiments is carried out, subjects judge the differences between tranches and report their feelings. It is found that for the neck depth and lapel step, the difference of each tranche is too big, which lead to incomprehensive experiments; while for gorge line position, the difference of each tranche is too small, it is difficult to distinguish the difference in a short reaction time. Finally adjusted tranches of three elements are shown in Fig. 4.

Draw sample pictures: In this part, three elements' all combinations are drawn out and ultimately get 90 (6×3×5)

figures of lapel collar female suits, then these sample pictures are all coded, such as $N_2G_1L_3$, where N_2 represents the second tranche of deep neck, G_1 represents the first tranche of the gorge line position, L_3 represents the third tranche of the lapel step. In order to exclude interference from colors, all images are black and white and in addition collar and button number, other elements in the figures are unchanged.

Confirm evaluation words: Based on former research, the words "like" and "professional" are chosen to evaluate the aesthetic of lapel collar female suits. "Like" represents the sense of preferences and "professional" represents the sense of professionalism.

EXPERIMENTALS

Instruments and subjects: Computers which has been installed E-Prime 2.0 are used in this study, monitors 17 inches with a resolution of 1024×768.64 college students of Soochow University are randomly selected as subjects (32 of whom were male, others are female; while 32 of whom are major in clothing, others are not), their ages are ranging from 20 to 25.

Experimental procedure: The subjects sit in front of a computer, the eyes from the computer screen 60 cm,

the visual angle is 12.3°×4.9. When experiment start, a symbol "+" appeared in the middle of the screen, that is to remind subjects experiment begin, then any one of the two vocabularies, "like" or "professional" will flash at the center of the screen, at last appears a picture of lapel collar female suit. style map. Subjects should judge if the picture is consistent with the vocabulary flashed before according to their first impression, if consistent, press "x" on the keyboard, if not, press "."(Czigler *et al.*, 2006; Peers and Lawrence, 2009).

Before the formal experiment, there will be six pictures as an exercise test. In addition to exercise pictures, all pictures of formal experiment completely presented in randomized order.

DATA ANALYSIS

After the experiment, use Emerge software to filter and merge data, then import data into SPSS software for analysis of variance, get an optimal collar of preferences and professionalism.

Sense of preference: The main effects and interactions analysis of preference are shown in Table 1, F values of three elements are ordered of 73.457, 41.806 and 26.343, Sig. = 0.000<0.01, indicating that to sense of preference, the main effect of the three factors are extremely significant; while Sig. values of interactions of three factors or any two of them (for example, N*G is stand for interaction between neck depth and gorge line position, N*G*L means interaction of three factors) are greater than 0.05, indicating the interaction of three factors are not significant. According to the principal of analysis of variance, tranches of the significant factors need further analysis of Duncan multiple comparisons.

Neck depth: Duncan multiple comparisons among tranches of neck depth is shown in Table 2, values that are not in the same column in the table reveals significant difference between these tranches and the larger the value, the better the result., .As seen, the fourth tranche has the largest value, which is 0.6146, so the fourth tranche of neck depth is liked by most people.

Gorge line position: Duncan multiple comparisons among tranches of gorge line position is shown in Table 3. As seen, the first tranche has the largest value, which is 0.5333, thus the first tranche of gorge line position is mostly liked.

Lapel step: Duncan multiple comparisons among tranches of gorge line position is shown in Table 4. As we can see,

Table 1: Variance analysis of preference

Source	F	Sig.
N	73.457	0.000
G	41.806	0.000
L	26.343	0.000
N*G	1.714	0.072
N*L	1.702	0.093
G*L	0.951	0.521
N*G*L	0.753	0.871

Table 2: Duncan multiple comparisons among tranches of neck depth

N	Subject				
	1	2	3	4	5
1	0.2711				
2		0.3781			
6			0.5073		
5				0.5542	
3				0.5750	0.5750
4					0.6146

Table 3: Duncan multiple comparisons among tranches of gorge line position

G	Subject	
	1	2
3	0.4028	
2		0.5141
1		0.5333

Table 4: Duncan multiple comparisons among tranches of lapel step

L	Subject			
	1	2	3	4
1	0.3663			
5		0.4735		
2		0.4948	0.4948	
4			0.5304	0.5304
3				0.5521

Table 5: Variance analysis of professionalism

Source	F	Sig.
N	75.247	0.000
G	45.320	0.000
L	19.619	0.000
N*G	1.604	0.099
N*L	1.498	0.071
G*L	2.232	0.022
N*G*L	0.784	0.833

the third tranche has the largest value, which is 0.5521, as a result, the third tranche of neck depth is the best.

Sense of professionalism: The main effects and interactions analysis of professionalism are shown in Table 5, F values of three elements are ordered of 75.247, 45.320 and 19.619, Sig. = 0.000<0.01, indicating that to sense of professionalism, the main effect of the three factors are extremely significant; while Sig. value of G*L is 0.022<0.05, Sig. value of others are greater than 0.05, indicating that except the interaction between G and L, other interaction of three factors are not significant.

Table 6: Duncan multiple comparisons among tranches of neck depth

G	Subject			
	1	2	3	4
1	0.361			
6		0.486		
2		0.495		
5			0.586	
3				0.683
4				0.714

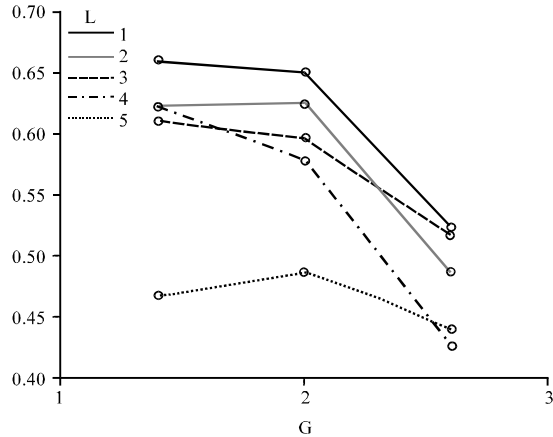


Fig. 4: Interactions between G and L

Neck depth: Duncan multiple comparisons among tranches of neck depth is shown in Table 6. It is obvious that the fourth tranche has the largest value, which is 0.714, thus the fourth tranche of neck depth is considered as professional by most people.

Interaction between G and L: Generally when interaction between two factors is significant, there is no need for their main effects analysis because then the significance of main effect is not important in the practical (Wang, 2006), instead, multiple comparison for mean of each level (tranche) combination could be done, finally chooses the optimum level combination.

As seen, lines in Fig. 4 are crossed, which reveals the existence of interactions between the two factors and G_1L_3 is the highest point in the figure, in other words, when the gorge line position is located in the first tranche, lapel step in third tranche, the collar get the highest result of professionalism, so G_1L_3 is the combination that most people feel professional.

CONCLUTIONS

Evaluation results indicates that three elements' main effects on sense of preference were extremely significant, which means each tranche of the three elements has very significant influence on effects of preference and $N_4G_1L_3$ is the lapel collar that most people prefer. Analysis of

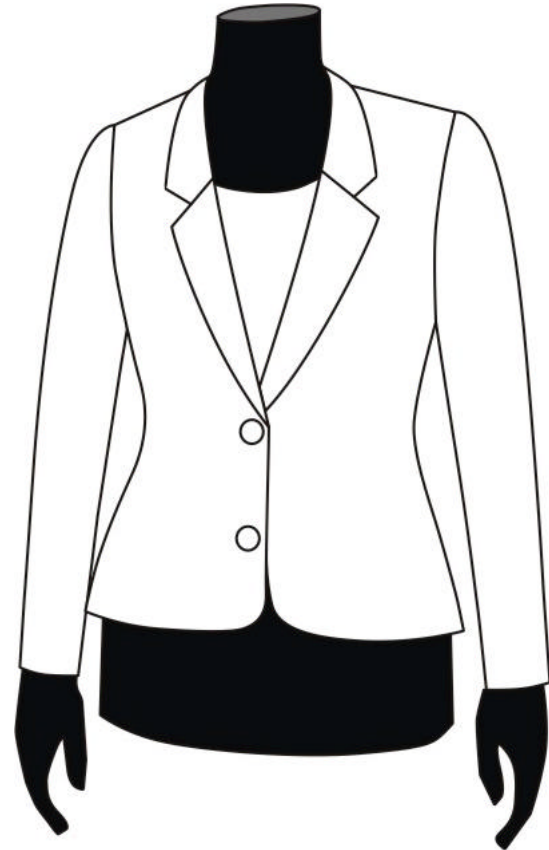


Fig. 5: Optimal lapel collar female suit

three elements' effects on the sense of professionalism shows that the main effect of neck depth, the interaction of gorge line position and lapel step were extremely significant and $N_4G_1L_3$ is the lapel collar recognized as professional by most people. Above all, $N_4G_1L_3$ is the most popular and the most professional lapel collar female suit for consumer group of college students, as shown in Fig. 5. The neck depth of this style of collar is opened to the waist, the gorge line is located in the 1/3 of neck depth and lapel step is as half as shoulder width, which can be used as a reference for manufacturers in the development of the female suits. In further research, normal consumers should be included as subjects and a mathematical model could be constructed to evaluate the sense of preference and professionalism of lapel collar female suits.

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