Examining the difference in impressions between makeup looks applied on facecharts and human faces

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Facecharts play an essential role in the standard practice in the beauty industry and function as an educational training tool for makeup artists. An experiment examined the difference between the impressions of makeup looks on facecharts and those on human faces. Seventy-one observers were invited to make impression judgments on ten makeup looks on both actual images and facecharts. The judges were asked to evaluate according to 19 impression scales. The 19 impression scales included adjectives: elegant, friendly, professional, authoritative, dependable, competent, solemn, genuine, warm-hearted, modest, gentle, sociable, healthy, serious, responsible, natural, self-confident, energetic, and thoughtful." Ten makeup looks were drawn on facecharts and then applied to the actual face of a female model. A facechart is a piece of 70-pound A4 photocopy paper with a printed face outline, facial features, and hair. It can help makeup artists map out where to place makeup products, i.e., lips, blush, eye shadow, eyeliner, and false eyelashes. The experimental data were analysed using a profile chart, RMS values, and T-test. The results revealed that the impression of the makeup looks on the facecharts and those on the human faces are significantly different in most impression scales.

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Introduction

Makeup artists have been using facecharts to help them discuss the desired look with their clients in the industry for many decades. Essentially, it's a piece of paper with a printed outline drawing of a face. Makeup artists used this outline to map out where to place different makeup products, including face powders, eyeshadows, lipstick, etc. Makeup artists use facecharts to evaluate the makeup look before applying it to the face. In other words, the makeup look on the facechart is the makeup artist's colour plan and the primary material for beginners to practice makeup. Makeup artists aim to make the makeup look on the facechart consistent with those on the actual face.

Facechart is a significant practice modality in the beauty industry, allowing makeup artists to communicate the desired makeup look with their clients effectively [1-4]. In Taiwan, fashion-related courses in vocational high schools utilise facecharts as training material. Students use facecharts to practice colour combination, various makeup techniques, blending methods, and conceptualising comprehensive makeup styles [5-7]. In addition, the exam of The National Vocational Skills Competition for Home Economics Students, organised by the Ministry of Education, Taiwan, aims to encourage students specialising in home economics to demonstrate their skill levels8 also uses the facechart to evaluate their skill level. A facechart is required to evaluate makeup techniques and aesthetics for level B beauty technicians in Taiwan [6,9]. Regardless of the training stage of a makeup artist or the actual application of makeup in practice, rehearsing the makeup look on the facechart is an essential skill for makeup artists. But the facechart is a two-dimensional flat plane, and the human face is three-dimensional. Even if the makeup is ultimately transferred from the facechart to the human face, we are still curious whether the impression given by the same makeup look can be consistent on the facechart and the human face. This study intended to understand the difference in impressions between the makeup looks on facecharts and those on human faces.

Experimental plan

To achieve the aim, this study conducted an experiment in which 71 observers were invited to make impression judgments on ten makeup looks on the images of actual faces and facecharts by using 19 impression scales. Each observer provided 380 impression judgments, i.e., (10 × 19) × 2 = 380. In total, 26,980 judgments were collected. These 71 observers include 28 males and 43 females. The average age is 23.06 (SD = 14.49), including 50 teenagers and 21 adults. The impression scales included 19 adjectives: “elegant”, “friendly”, “professional”, “authoritative”, “dependable”, “competent”, “solemn”, “genuine”, “warm-hearted”, “modest”, “gentle”, “sociable”, “healthy”, “serious”, “responsible”, “natural”, “self-confident”, “energetic”, and “thoughtful”. The data were collected using a 7-step categorical judgment indicating the strength of the impression scale describing the makeup looks, from “irrelevant” to “strongly related to”. Ten makeup looks were used for the experiment. The techniques applied for each look are summarised in Table 1.

No.	Makeup technique
M1	The eye shadow is a reddish-brown gradient, and the blush and lipstick adopt similar colours. It is commonly known as the dry rose in the cosmetics market.
M2	The eye shadow is a brown gradient, the blush is reddish brown, and the lipstick is red. The representative character is Marilyn Monroe.
M3	The upper eyeshadow has a pink gradient; the lower eyeshadow uses glitter. The blush and lipstick adopt a pink colour.
M4	The eye shadow is a wine-red gradient, and the blush and lipstick adopt similar colours.
M5	The eye shadow is black gradient, and the blush and lipstick adopt pink colour—emphasis on thick black eye makeup (including eyeshadow, eyeliner, and thick false eyelashes). The representative figure is the Canadian female singer Avril.
M6	Clear and natural nude makeup. The eyeshadow has a light brown gradient, and the blush and lipstick adopt pale pink.
M7	The eye shadow adopts a purple two-stage style, and the blush and lipstick are similar colors.
M8	The eyeshadow is blue highlights, and the blush and lipstick adopt fuchsia.
M9	The eye shadow is a brown gradient, and the blush and lipstick adopt a reddish brown.
M10	The eye shadow and blush have a light orange gradient, and the lipstick adopts a pumpkin orange colour. The blush is large and horizontal, spanning the bridge of the nose.

Table 1: Makeup techniques for 10 looks.

Ten makeup looks are drawn on a facechart and applied to the actual face of a female model. The facechart is a 70-pound A4 photocopy paper printed with face outline, facial features, and hair, mapping out where to place makeup products, i.e., lips, blush, eye shadow, eyeliner, and false eyelashes. According to the makeup plan on the facechart, it is applied to a female model's face to create ten makeup looks. The facecharts are given in Figure 1. These makeup looks were created by the first author, who held a teaching position for seven years in the Department of Fashion Styling at Yuda Vocational High School, Taiwan.

The digital camera was used to take each makeup look on the female face under standard exposure at a standard colour temperature. The photos taken were displayed on the iPad for the observer to make impression judgments, as shown in Figure 2.

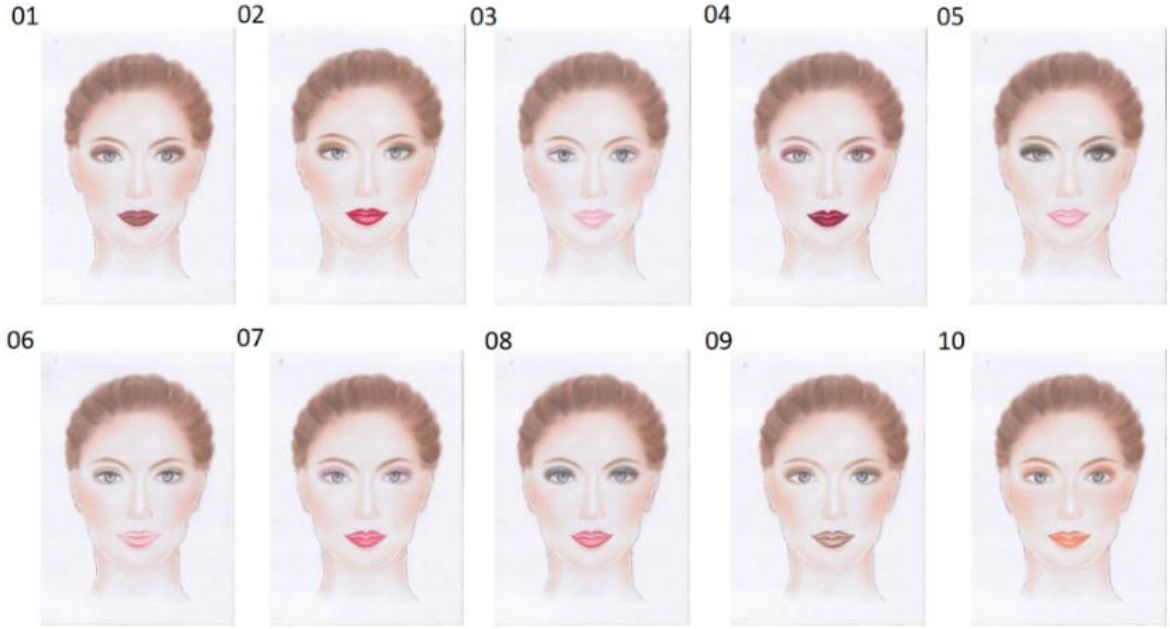


Figure 1: Ten makeup looks drawn on the facechart.

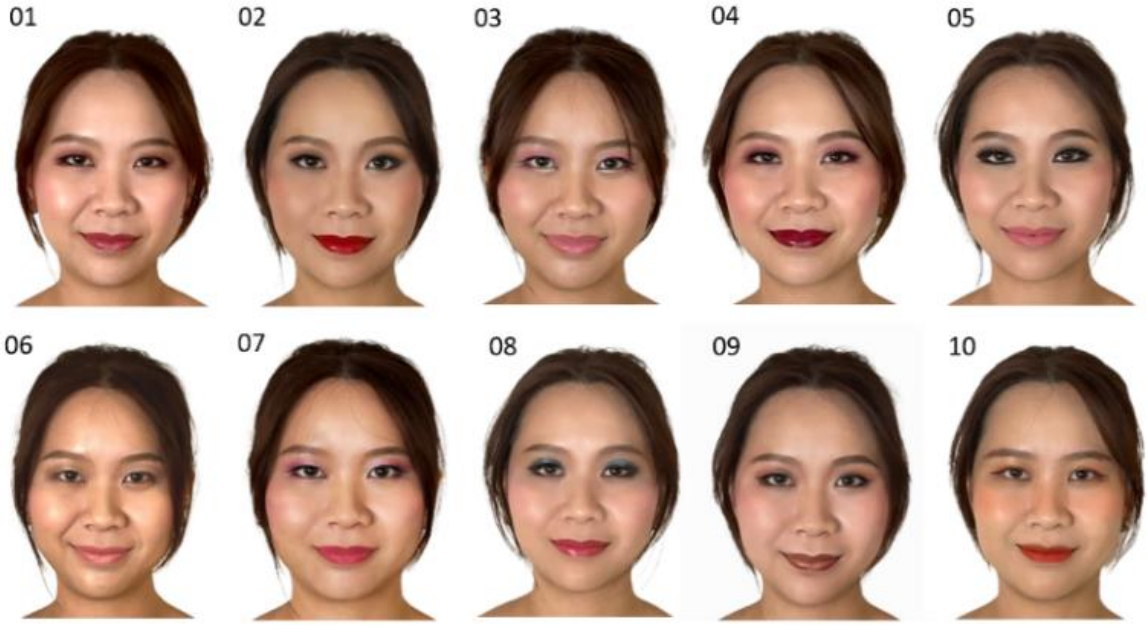


Figure 2: Ten makeup looks drawn on the facechart were applied to the actual face.

Intra- and inter-observer variation

The data collected from seven-step categorical judgment on each scale were converted into numbers. The higher the number, the more it fits the adjective description. Prior to analysis, the intra- and inter-observer variations were examined by RMS (root mean square). The former is to see whether the observers can repeat their judgment. The latter examines how well the individual observer agrees with the mean results. The RMS equation is given below.

$$\mathrm{RMS} = \sqrt{\frac{\sum(X_i - Y_i)^2}{n}}$$

For intra-observer variation, X_i and Y_i are the initial and replicated judgments, respectively. For inter-observer variation, X_i and Y_i are individual data and all observer's averages, respectively. n is the number of data. For RMS of 0, it represents a perfect agreement between two data arrays. It can be seen that the intra-observer variations ranged between RMS of 0.51 and 2.90. And the inter-observer variations ranged between RMS of 0.93 and 2.63, as shown in Figure 3. Whether intra- or inter-observer variations, the RMS values are less than 3.0, indicating that the observers can provide consistent judgments, and the impression judgments obtained from individual observers agree with those obtained from all observers.

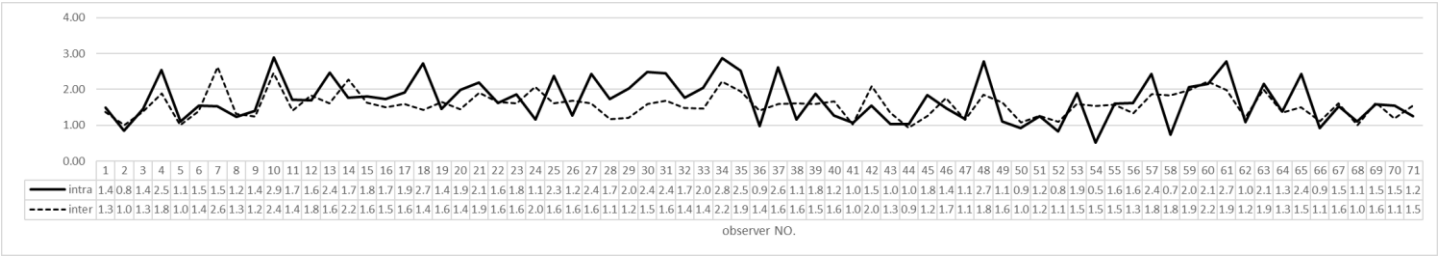


Figure 3: RMS for inter- and intra-observer variations.

Results

To understand the difference between the impressions given by makeup looks on the facechart and those on the actual face, the experimental data were illustrated in the profile chart, as shown in Figure 4. Further, the RMS was used to calculate the actual difference, which can be used to intuitively observe the difference between two data arrays. The results are given in Table 2. Then, a T-test was used to see the statistical difference between the two data sets. The significant difference ($p<0.05$) between the two data arrays identified by the T-test is integrated into Table 2 and indicated by a grey shade.

In Figure 4, the solid line represents the mean values of impressions obtained from actual makeup looks, and the dotted line represents those obtained from the facechart. In Figure 4, the two-line trend appears in five patterns.

1. The first pattern is that the two lines overlap, meaning that all impressions of makeup look on the facechart are consistent with those on the actual face. The makeup of M2 was found to belong to this pattern.

2. The second pattern is that the two lines are close, and only some data points overlap, which means that the makeup impression on the facechart is close to those on the actual face, and some makeup impressions are consistent. M1 and M9 were found to belong to this pattern.
3. The third pattern is that the two lines appear parallel and close, which means that all the makeup impressions on the facechart are different from those on the real face, but all the difference is not significant. It was found that the makeup of M4, M5, M7, and M8 all belong to this mode.
4. The fourth pattern is that the two lines are far apart, but there are still some data points that are close, which means that the impressions of makeup on the facechart are different from those on the real face and only on a few impression scales are close, including M6 and M10.
5. The fifth pattern is that the two lines are parallel and far apart, which means that the makeup looks on the facechart are inconsistent with those on the actual face in all impression scales. The makeup of M3 was found to appear as this pattern.

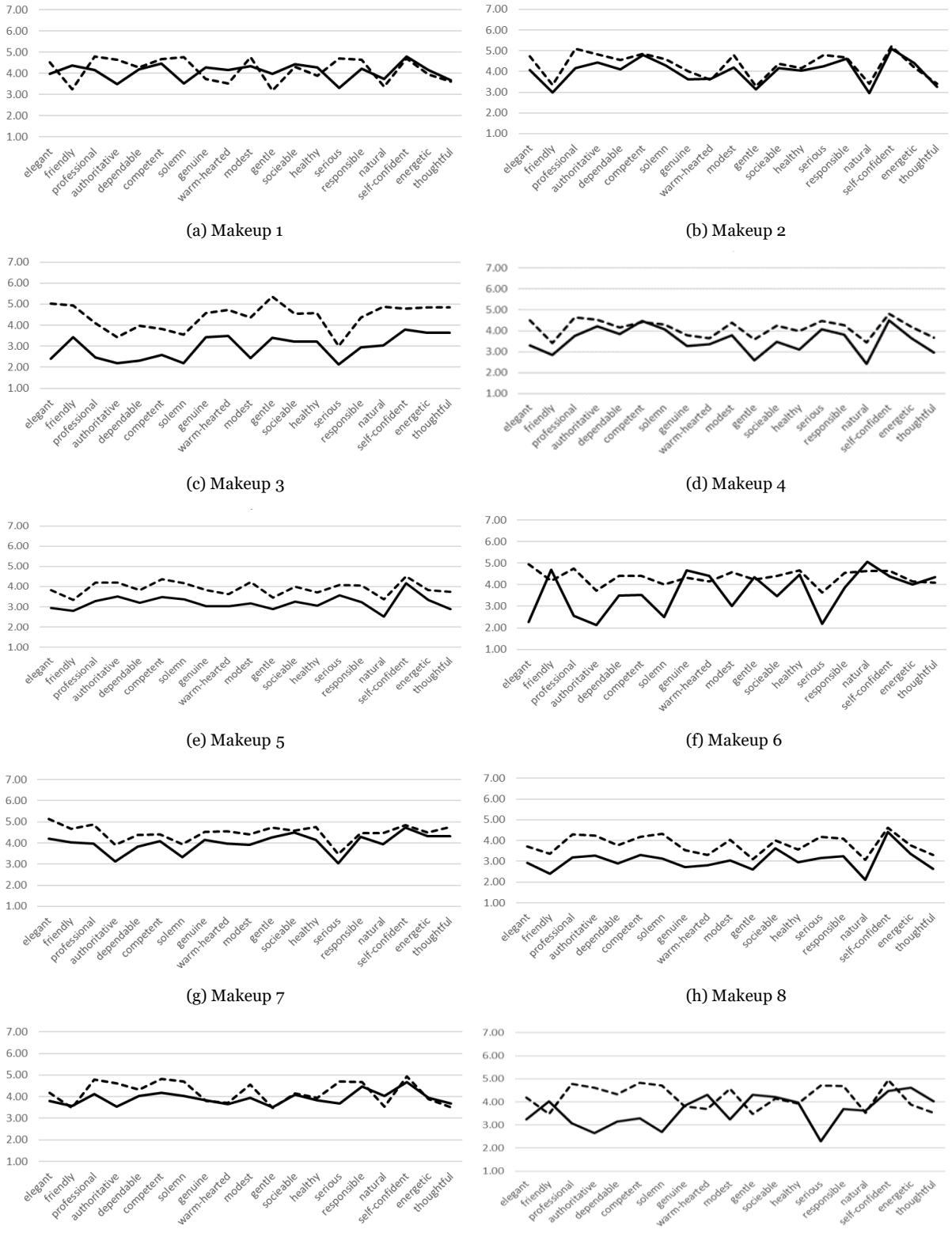
Impression scales	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	Mean	The number of sig.
elegant	2.22	1.49	3.26	2.58	2.23	3.29	1.89	1.76	1.84	2.23	2.28	9
friendly	2.12	1.45	2.59	1.86	1.82	2.42	1.99	1.67	1.68	2.05	1.97	7
professional	2.14	1.46	2.31	2.15	2.19	2.97	1.76	2.09	1.82	1.87	2.08	10
authoritative	2.49	1.58	1.87	2.06	2.24	2.49	2.01	2.42	1.97	1.58	2.07	8
dependable	1.92	1.38	2.19	1.85	2.00	2.03	1.78	1.94	1.72	1.75	1.86	7
competent	1.9	1.38	2.13	1.84	2.10	2.29	1.79	2.15	1.73	1.81	1.91	6
solemn	2.64	1.62	2.11	2.25	2.46	2.37	1.64	2.33	2.07	1.41	2.09	8
genuine	1.94	1.39	2.15	1.84	2.00	1.84	1.77	1.87	1.78	1.86	1.84	5
warm-hearted	2.16	1.47	2.15	1.93	1.76	2.09	1.85	1.52	1.78	1.98	1.87	6
modest	1.70	1.31	2.55	2.02	2.22	2.45	1.55	2.14	1.89	1.75	1.96	10
gentle	2.14	1.46	2.81	2.22	1.89	2.19	1.94	1.63	1.99	1.99	2.03	6
sociable	2.16	1.47	2.55	2.10	2.27	2.07	1.53	1.82	1.94	1.85	1.98	4
healthy	1.82	1.35	2.53	2.26	1.95	1.87	1.65	1.85	1.85	1.91	1.90	5
serious	2.60	1.61	1.82	1.94	2.19	2.15	1.92	2.36	2.17	2.03	2.08	8
responsible	2.07	1.44	2.31	1.78	1.91	1.97	1.65	2.33	1.71	1.75	1.89	6
natural	1.94	1.39	2.91	2.17	1.8	2.19	1.76	1.85	1.94	2.27	2.02	6
self-confident	1.78	1.33	2.49	1.99	1.95	1.79	1.59	1.87	1.60	1.70	1.81	2
energetic	1.82	1.35	2.24	2.18	1.76	1.92	1.54	1.86	1.91	1.85	1.84	4
thoughtful	1.85	1.36	2.57	2.04	1.84	1.89	1.73	1.82	1.72	1.81	1.86	6
Mean	2.07	1.44	2.40	2.06	2.03	2.23	1.75	1.96	1.85	1.87	1.96	
The number of sig.	10	5	19	12	18	10	11	16	7	15		

Table 2: RMS between facechart and actual makeup looks.

Table 2 shows that the impression given by the makeup on the facechart and those on the actual face are significantly different in most impression scales. Only a few makeup impressions on the facechart are consistent with the real face. The overall difference in terms of RMS value is 1.96 on average. Regarding ten makeup looks, the RMS ranges between 1.44 and 2.40. Regarding the 19 impression scales, the RMS ranges between 1.81 and 2.28.

In terms of 10 makeup looks, M3 was found to have the most significant difference in impression between makeup looks on the facechart and the real face, M2 the minimum difference. In other words, the impression given by the makeup look consisting of a pink gradient on the upper eyeshadow, glitter on the lower eyeshadow, and pink blush and lipstick cannot be conveyed using a facechart. The impression given by the makeup look consisting of a brown gradient on the eyeshadow, a reddish brown blush, and red lipstick can be conveyed by a facechart.

Regarding the 19 impression scales, 'self-confident' was found to be the least discrepant scale. In other words, the impression scale of "self-confident" given by makeup on a facechart is the closest to the impression of the same makeup on the actual face.



(a) Makeup 1

(b) Makeup 2

(c) Makeup 3

(d) Makeup 4

(e) Makeup 5

(f) Makeup 6

(g) Makeup 7

(h) Makeup 8

(i) Makeup 9

(j) Makeup 10

Figure 4: Profile chart of makeup looks on each impression scale. The solid line represents the actual makeup looks, and the dotted line represents the facechart.

Conclusion and discussion

This study intended to understand the difference between the impressions given by makeup looks on facecharts and those on human faces. The results revealed that the impression given by the makeup looks on the facechart and those on the actual face are significantly different in most impression scales. The reasons behind this difference may be as follows: (1) There is no overall systematic planning for the ten makeup looks. The styles used range from classic makeup looks to fashion trends, and the colours and techniques used are also quite different. (2) The effect of skin tone. The study by Wu et al. pointed out that skin colour significantly impacts the impressions induced by lipstick colours; the models derived from their data indicated the difference between lipstick and skin colours determines the impressions [10]. In this study, not only lipstick colours were used, but eye shadow and blush colours were also involved. These colours combined together create a more complex and comprehensive makeup effect. (3) The effect of glitter makeup on the face differs greatly from that on paper. It is highly probable that the texture of cosmetics and the two- or three-dimensional reflection may influence the impressions. (4) The shape of the face may affect the impressions delivered. If we take Makeup 6 as an example, we can see that the nude makeup is close to no makeup, and there is no noticeable colour added to the face; however, the difference in impression between the facechart and the actual face is pronounced. It can be inferred that the face shape will affect the impressions. (5) The hairstyle, expression, and the position of cosmetics colour may also be factors causing the difference. (6) Self-presentation [11] strategies differ across individuals but are also influenced by environmental factors. The former may vary in age, gender, and culture; the latter may be environmental factors, including social context, fashion trends, and human interaction.

This is a preliminary study, and it is necessary to consider many other factors and detailed plans in the future to obtain more accurate results.

Applying makeup on Facechart is a vital practice subject for novice makeup artists. It allows novices to practice makeup skills without any worries. However, applying makeup on a facechart seems unable to meet the needs of makeup artists and customers. It is strongly recommended that the formal certification related to the makeup technique reconsider the effect of the facechart. The impression of makeup is not the same as what you see on a facechart.

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