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Research on Chinese Consumers' Preferences and Characteristics Regarding Scalp Care Shampoo Products

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Abstract: This study aims to explore consumers' preferences on different types of shampoo products among women aged 20s and 30s from Beijing and Shanghai. 100 women who have scalp troubles were selected as respondents. By conducting HUT blind test, we compared the consumers' feedbacks on 3 scalp care shampoo products but with 3 different formulations, i.e., 2 products with silicone-free formula and 1 product containing silicone oil. We adopted quantitative methodology through the whole analysis, and evaluation results of different groups were obtained by PCA analysis. The results of the study are recapped as follows: (1) Although there is no obvious difference in consumers' preference among different ages, there are obvious differences in different regions. (2) Beijing consumers are satisfied with the sensory efficacy of the 3 products while Shanghai consumers are less satisfied with any of them. It is speculated that Shanghai consumers have a higher expectation for scalp care products; (3) Products containing silicone oil shows higher usage satisfaction when compared with silicone- free formula. It is better to emphasize long-term efficacy for silicone-free formula when planning GTM strategy, so that it could guide consumers to achieve their post-purchase rationalization. (4) Although the tested products all have scalp care function, consumers are more concerned about the effects on the health status of the hair than the scalp care effects.

Keywords: Shampoo; Scalp care; Hair care; Consumer research; PCA

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1. Introduction

The sustained development of China's economy has also promoted the rapid development of China's shampoo industry, especially the high-end shampoo industry. According to the results of CBNData & Tmall Global High-end Hair Care Industry Consumption Insights Report in 2020 [1], dandruff problems and hair loss caused by unhealthy scalp are common problems for consumers. Therefore, repairing, moisturizing, and preventing hair loss are the most important and basic functions which consumers most care about when they are purchasing products.

If scalp problems are neglected, the barrier function of the scalp can be easily destroyed, and it will result in scalp inflammation, follicle inflammation, and other problems [2-4]. As consumers pay more and more attention to scalp health, the ingredients of washing and hair care products have become one of the means for products to maintain competitiveness. As reported, the post-90s/95s are the main consumers pursue high-end scalp cleansing products [1]. The high-end scalp care products that have appeared in recent years include silicone-free non-irritating soothing and moisturizing shampoo, scalp soothing and conditioning function massage cream containing active ingredients, etc. [4] Among them, "silicone-free, no

irritation" has become one of the selling points of many high-end scalp care products.

A product containing silicones can accumulate on the hair, and it helps to make our hair shine, silky, and free of frizz [5,6]. However, since silicones are insoluble in water, long-term use of shampoo containing silicones may lose elasticity, and excessive accumulation may even cause hair loss [6].

For many reasons, the concept of silicone-free hair care products is sought after by many consumers. This study aims to explore whether the presence or absence of silicones affects using experience from the perception of consumers, as well as the differences of consumers" evaluation in different regions and age groups.

The structure of the scalp is similar to the skin of other body parts, but there are also differences in evaluations based on user experience and needs of different groups. "Anti-hair loss enthusiasts" [7] has found that 77% of the respondents said they were troubled by hair loss, among which women's attention to the topic of anti-hair loss was particularly prominent. Post- 90s/95s pay the most attention to anti-hair loss related topics, and they are also the main consumers of hair loss preventing products, followed by those born after 85s. Because oily hair is more likely to cause hair loss, consumers with oily hair prefer anti-hair loss products. Plus, consumers in the post-90s/95s age group have more scalp care and moisturizing efficacy needs than other age groups. Consumers from first-tier cities, with higher consumption capability, as well as post-85s and post-90s, prefer high-end salon brands [1]. The report also points out that young people in economically developed areas such as Beijing and Shanghai are the most anxious about hair loss [7].

Therefore, to explore the preferences and evaluations of shampoo products with scalp care effects in different groups of people, this study selected 100 consumers who have scalp care needs, based on region (Beijing, Shanghai), age, formula (silicon-free, silicone- containing product) which are set as the independent variable, and the consumer evaluation is set as the dependent variable. The three products are blindly tested. Home Use Test (HUT) and Trained Panel Test (TPT) are respectively used to evaluate the customer satisfaction and intensity of each attribute of every product. Correlation analysis and principal component analysis (PCA) were also carried out based on the data. We focus on the following research angles:

(1) Based on different formula products, is there any difference from different regions when they evaluated the usage experience of products?
(2) Based on different formula products, is there any difference from different ages when they evaluated the usage experience of products?
(3) How does the presence or absence of silicone oil system affect consumer's satisfaction?

2. Materials and methods

2.1. Test materials

Three different brands of shampoos on sale in the market. Randomly named R3, H5, S9. These three products have the same efficacy which is used for oily scalp, anti-dandruff and relieves itching. However, H5 is containing silicone while the other two, R3 and S9, are silicone free.

2.2. Respondents

A total of 100 female adult respondents who have been screened in Beijing (50) and Shanghai (50). All of them are aged from 20s to 39s and have suffered from dandruff, greasy scalp and flat hair problems.

2.3. Methodology

2.3.1. Trained panel test: Intensity evaluation

Sixteen experts conducted intensity evaluations on 24 attributes of 3 samples.

Table 1. Five stages and their sub-attributes in intensity evaluation

Stage	Attributes	Stage	Attributes
Before use	Thickness Fluidity	**When using shampoo**	Solubility Easy to foam Bubble size Foam volume
When rinsing	Easy to rinse Makes hair silky		
After rinsing	Easy to comb Dryness Moisturizing Softness Elasticity Fragrance	**After blow - drying**	Easy to comb Dryness Softness Elasticity Shine Fragrance Shaggy

"Before use," "When using shampoo," "When rinsing," "After rinsing," "After blow-drying." The specific attributes of each stage are shown in **Table 1**. Scoring range: 1 to 15 for all attributes. The higher the score it gets, the stronger the intensity of the attribute attained.

2.4. Home use test: Consumer satisfaction

One hundred shampoo users used samples normally at home according to their usual usage habits and evaluate them by filling out the questionnaire. The test duration is 9 days and is divided into 3 rounds: the first round is after using R3 products, consumers will complete the personal information including personal needs, hair care routine, etc., and evaluation would be asked. The second round is also an evaluation after using S9 products, and the third round is after using H5 products. Each round of testing lasts for 3 days, each product needs to be used for 3 consecutive days, and the questionnaire should be filled out on the night of the last day of each product using.

Satisfaction evaluation is divided into 6 stages: "Before use," "When using shampoo," "When rinsing," "When wipe with a towel," "When completely dry," and "Overall satisfaction." The specific attributes of each stage are shown in **Table 2**. Respondents were asked to score shampoo performance in according to the attributes by how the hair feels like after using samples. They are given a nine-point scale, in which score 1 means unsatisfied and score 9 means very satisfied.

3. Results

SPSS21, R program 3.4.2., and EXCEL2016 were used to analyze the collected data.

3.1. Trained panel test

Test at 5% significance level and the evaluation results of the three samples tested by the experts are shown in **Table 3**. Conclusions can be drawn as below:

In the "Before use" stage, there is no significant difference between H5 and S9 samples in "Thickness," but there is a significant difference between R3 and the other two samples. In "Fluidity", the three samples are significantly different from each other. As a result, sample R3 is thicker than S9 and H5. Sample H5 is easier to drip than S9, and S9 is easier to drip than R3.

In the "When using shampoo" stage, there is no significant difference between R3 and H5 in "Bubble size," but there is a significant difference between S9 and the other two samples, from which we can infer that R3 and H5 are able to produce more foam than S9.

Table 2. Six stages and their sub-attributes in consumer satisfaction evaluation

Stage	Attributes	Stage	Attributes
Before use	Thickness Fluidity	**When completely dry (dry hair)**	Non-greasy Fresh Soothing Flakes away Oil-controlling Shaggy
When using shampoo	Solubility Easy to foam Foam volume Bubble size		
When rinsing	Silky Easy to rinse	**Overall**	Wet hair satisfaction Dry hair satisfaction Satisfaction of use Satisfaction of functions Overall satisfaction
When wiping with a towel (wet hair)	Moisturizing		
When completely dry (dry hair)	Silky Softness Scalp moisturizing		

Table 3. Evaluation results in trained panel test

Stage	Attributes	R3±SD	H5±SD	S9±SD
Before use	Thickness	12.5±0.7b	10.9±1.2a	10.9±0.7a
	Fluidity	4.2±1.3a	10.1±0.9c	9.1±1.2b
When using shampoo	Bubble size	10.8±1.3b	10.6±1.3b	8.4±1.1a
When rinsing	Easy to rinse	12.3±1.1b	11.6±0.7a	11.4±0.6a
After rinsing	Easy to comb	9.4±1.5a	11.3±1.2b	9.9±1.3a
	Dryness	6.8±1.5a	9.1±1.4b	7.2±0.7a
	Elasticity	10.6±1.2b	9.8±1.2ab	9.1±1.1a
After blow-drying	Dryness	11.1±1.2b	11.1±1.2b	10.1±1.4a
	Softness	10.5±1.3b	9.7±1.1ab	9.5±1.1a

*Attributes with Statistical significance are shown only; Different letters in the table represent the results of multiple comparisons, and samples with the same letter indicates that there is no significant difference in the same index

In the “When rinsing” stage, there is no significant difference between H5 and S9 in “Easy to rinse,” but there is a significant difference between R3 and the other two samples which means sample R3 is easier to rinse than H5 and S9.

In the “After rinsing” stage, R3 and S9 products have no significant differences in “Easy to comb” and “Dryness,” but there is a significant difference between H5 and the other two samples. As for “Elasticity,” there is a significant difference between R3 and S9, but there is no significant difference between H5 and any of the others. These results represent that the hair after using sample H5 is easier to comb and softer while it's wet. However, the hair after using R3 has more elasticity.

In the “After blow-drying” stage, R3 and H5 have no significant difference in “Dryness,” but there is a significant difference between S9 and the other two samples. In “Softness,” there is a significant difference between R3 and S9, but there is no significant difference between H5 and the other two samples. Overall, the hair after using samples H5 and R3 is softer, and the hair after using R3 is softer than S9.

3.2. Home use test

One hundred consumers evaluated the satisfaction of the three samples in 24 attributes. From the analysis results, there are many differences in the evaluation of the three samples in Shanghai and Beijing. However, consumers of different ages almost have no different evaluations on the use of the three samples, except for "Thickness," "Fluidity." Therefore, this paper is only presented with the satisfaction evaluation between different cities, as shown in **Figure 1**. From Figure 1, overall, consumers in Beijing preferred S9 and H5, but consumers in Shanghai were not satisfied with these three samples.

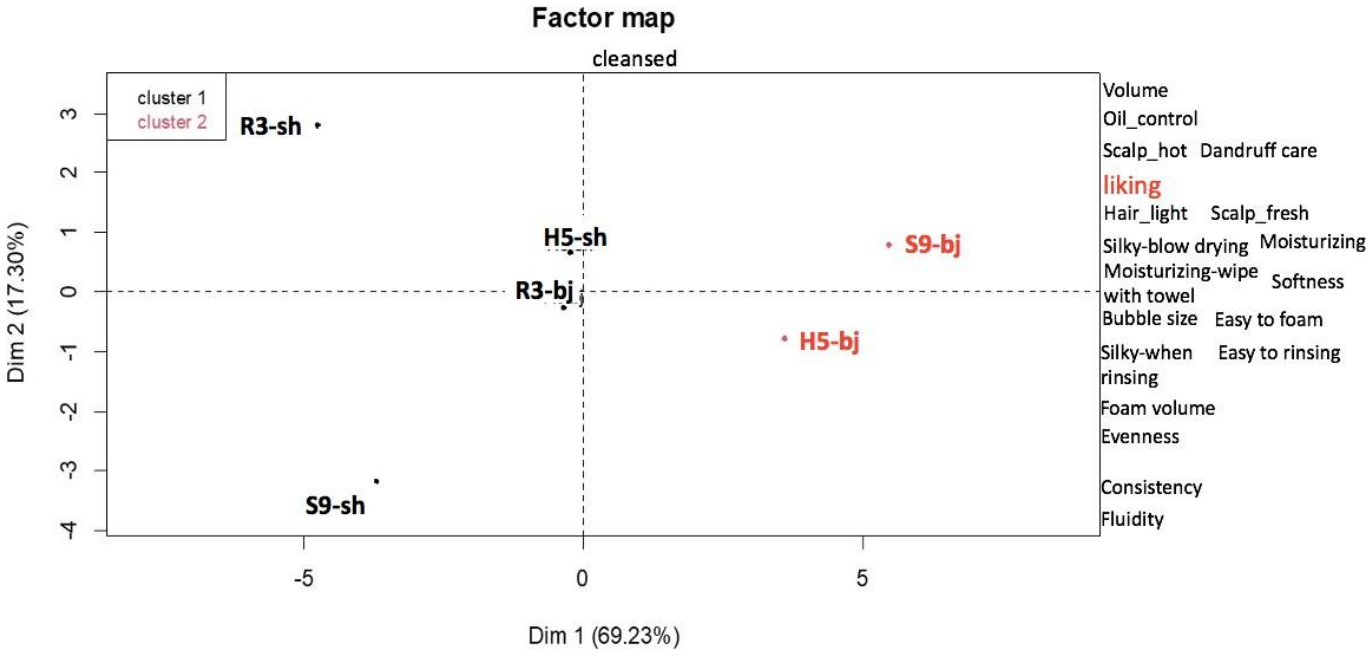

Figure 1. Overall evaluation of use

In order to analyze which attributes, differ from others when comes to different regions. our study measured attributes under three stages: "when applying to hair," "when rinsing" and "When completely dry, the condition of hair." We can see the result in **Figures 2-4** below.

We found that at *"*when applying to hair*"* below, consumers in Beijing believed that the four attributes of the three samples were strong in intensity, while consumers in Shanghai were completely the opposite. And maybe because of this reason, compared with R3, Beijing consumers more prefer S9 and H5, while Shanghai consumers are not satisfied with all three samples. Obviously, consumers both in Beijing and Shanghai cannot clearly distinguish the difference of intensity between samples. And the results of the intensity analysis from both regions are all inconsistent with experts in this stage.

In stage "when rinsing," compared with R3, Beijing consumers more prefer S9 and H5, while Shanghai consumers are not satisfied with all three samples. The result is the same with the "when applying to hair" stage. Although consumers in Shanghai also felt that H5 is smooth and easy to rinse, satisfaction level of H5 is still relatively low. This can explain that, regarding the "smoothness of hair" and "ease to rinse," as a product containing silicone, the intensity of H5 is unable to meet the requirements of Shanghai consumers, by which we can infer that consumers from Shanghai have a higher requirement than Beijing regarding products with silicone. Different from the previous stage, in this stage, consumers in Beijing can clearly distinguish the difference of intensity between samples, and the results are basically the same as experts. Although consumers in Shanghai can also distinguish the difference, the results are different from those of experts.

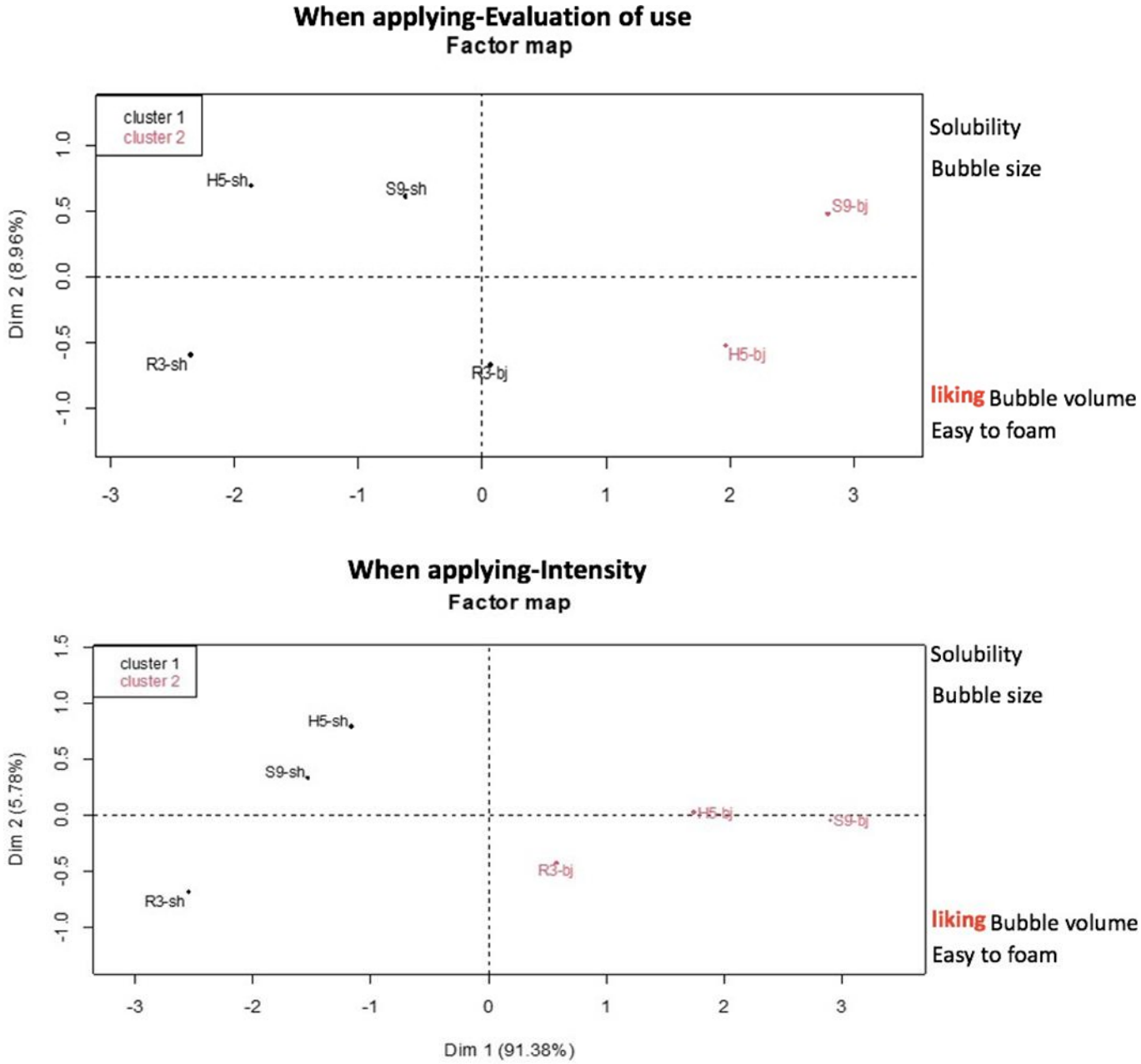

Figure 2. "When applying to hair"

In stage "when rinsing," compared with R3, Beijing consumers more prefer S9 and H5, while Shanghai consumers are not satisfied with all three samples. The result is the same with the "when applying to hair" stage. Although consumers in Shanghai also felt that H5 is smooth and easy to rinse, satisfaction level of H5 is still relatively low. This can explain that, regarding the "smoothness of hair" and "ease to rinse," as a product containing silicone, the intensity of H5 is unable to meet the requirements of Shanghai consumers, by which we can infer those consumers from Shanghai have a higher requirement than Beijing regarding products with silicone. Different from the previous stage, in this stage, consumers in Beijing can clearly distinguish the difference of intensity between samples, and the results are basically the same as experts. Although consumers in Shanghai can also distinguish the difference, the results are different from those of experts.

We found that in stage "When completely dry," consumers in both regions are satisfied with H5 (shampoo with silicon), where consumers of both regions can perceive that their hair becomes smooth and

soft after using H5.

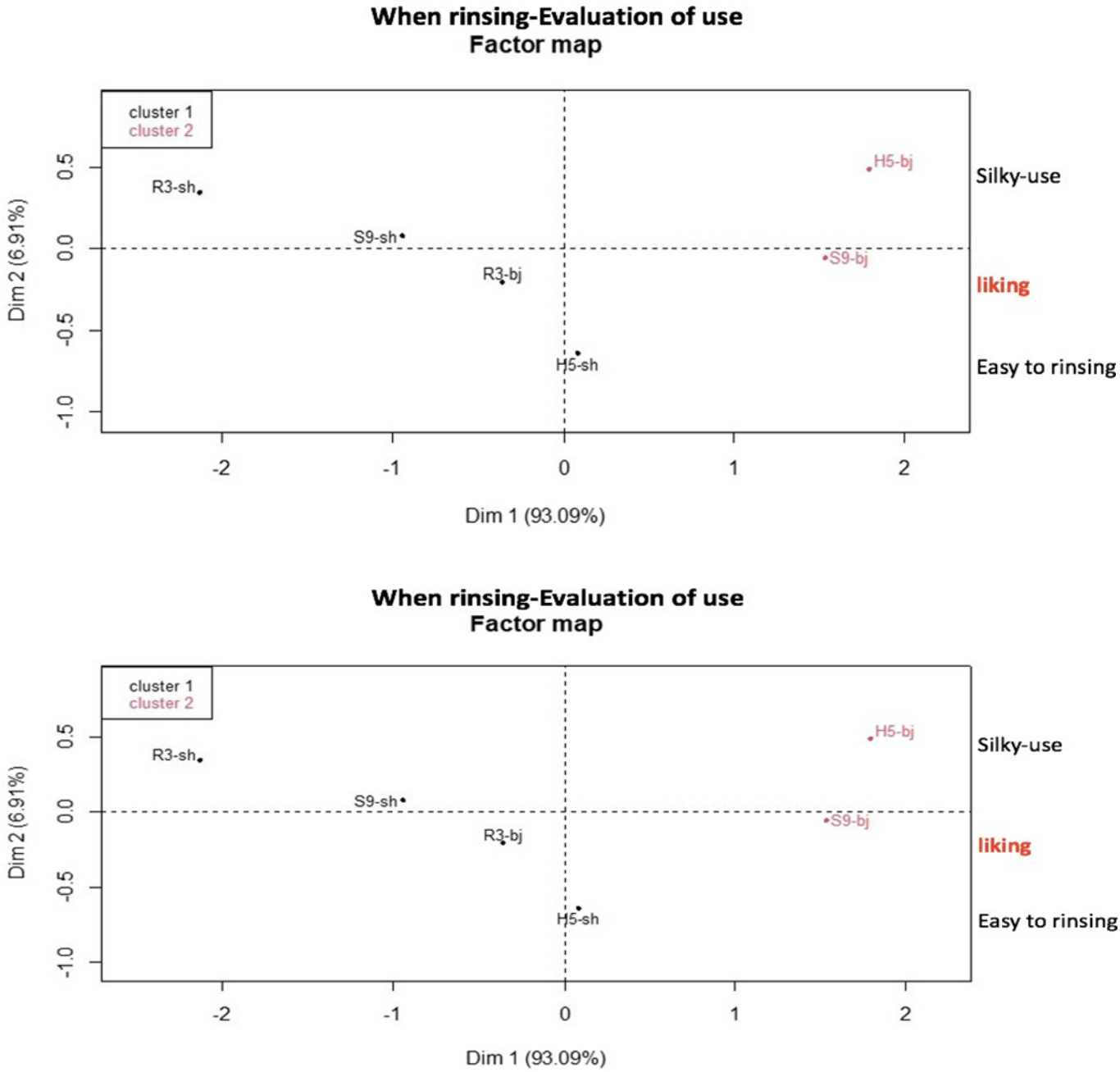

Figure 3. "When rinsing"

As silicon-free products, Beijing consumers were satisfied with S9 and R3, while Shanghai consumers are not. We can infer that compared to silicon-free, Shanghai consumers more prefer products with silicone while Beijing consumers like both of them.

In the final round evaluation, we investigated the customer's overall evaluation of the samples from the scalp and hair perspectives. We investigated 21 attributes, and here only the 10 most important attributes for customers are selected. From Table 4, it can be immediately known that there is a significant difference in the use evaluation of the three products by consumers from Beijing and Shanghai. Especially for the product S9, there are differences in the evaluation of attributes like "Lightness," "Silky," "Repaired," "Nutritious," "Healthy scalp environment," "Moisturizing," "Toughness," "Long-lasting fragrance" with

people from Beijing believe that the user experience of S9 feels better as for all these attributes. Regarding product R3, only the evaluation of "Shine" is considered by people from Beijing to be significantly better than those of Shanghai, while other attributes are considered with no significant difference.

For H5 products, compared with other attributes, only people from Beijing and Shanghai have obvious differences in the evaluation of "Long-lasting fragrance." Among these 10 attributes, regardless of which product, only "Hair strength" was tested with no significant difference in the evaluation of use by Beijing and Shanghai people. Consumers in Shanghai can clearly distinguish the difference of intensity between samples, but the analysis results are inconsistent with experts. While consumers in Beijing cannot distinguish clearly.

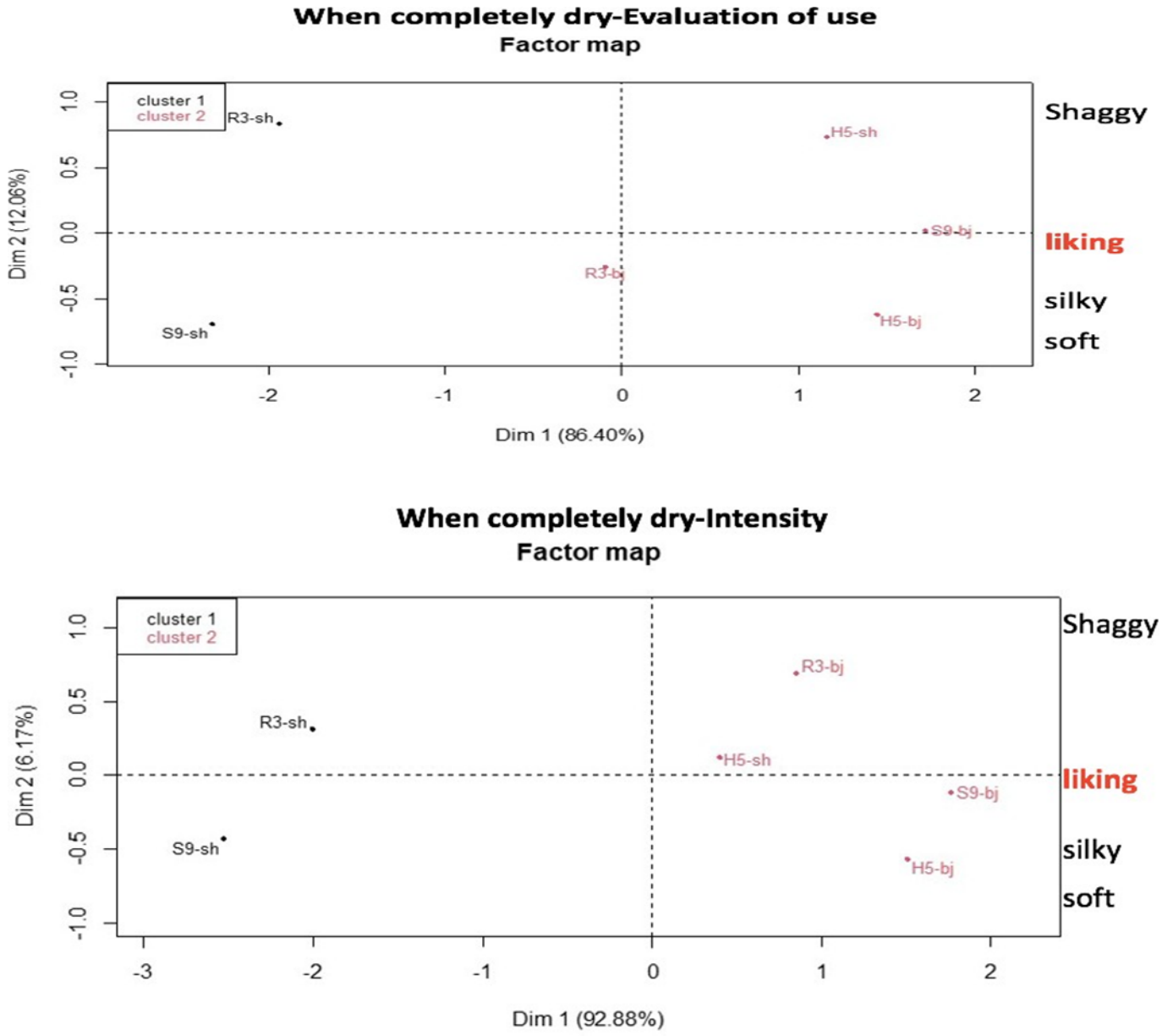

Figure 4. "When completely dry, the condition of hair"

Table 4. Overall evaluation

	R3		H5		S9	
	Beijing	Shanghai	Beijing	Shanghai	Beijing	Shanghai
Lightness	7.2	7.0	7.4	7.2	7.5*	6.9*
Silky	7.1	6.8	7.6	7.3	7.5*	6.8*
Repaired	7.1	6.7	7.3	6.9	7.3*	6.6*
Nutritious	7.3	6.8	7.3	7.1	7.6*	6.8*
Shine	7.2*	6.6*	7.3	7.1	7.4	6.9
Healthy scalp environment	7.2	7.2	7.4	7.2	7.5*	6.9*
Hair strength	7.3	7.3	7.3	7.5	7.4	7.1
Moisturizing	7.2	6.8	7.6	7.2	7.6*	6.9*
Toughness	7.2	6.9	7.3	6.9	7.3*	6.7*
Long lasting Fragrance	7.0	6.6	7. 3*	6.6*	7.1*	6.2*

* Attributes with statistical significance.

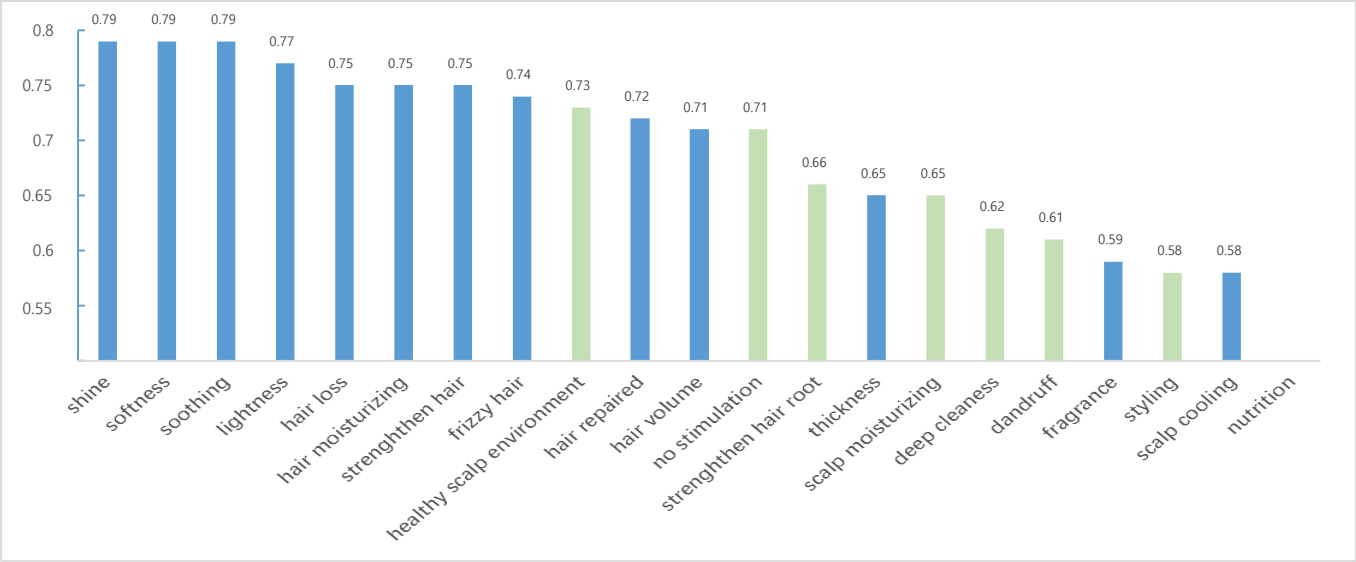

Figure 5. Correlation of each attribute with overall evaluation of use

In addition, we tested the correlation of each attribute with an overall evaluation of use. The result is shown in Figure 5. We can know that the top 10 attributes are mostly about hair care. This shows although the three products we tested have both scalp care (green columns) and hair care efficacy (blue columns), consumers are more concerned about whether the products are effective for hair health than scalp care.

4. Conclusion

There are obvious differences between Beijing and Shanghai, but there are not enough differences between different age groups. Beijing consumers are satisfied with three of them which Shanghai consumers are less satisfied with. We can infer that Shanghai consumers have higher expectations for scalp care products. Also,

even if their perception of different intensities is different from the professional evaluation of experts, consumers can still feel the difference between products during they rinsing and when the hair is completely dry after using shampoo. We can see that products containing silicones were showing higher satisfaction of use compared to silicone-free ones. Therefore, for silicone-free products, long-term efficacy should be emphasized in marketing to guide consumers to purchase silicone-free products for scalp health. In addition, consumers are more concerned about whether the products are effective for hair health than scalp care.

Disclosure statement

The authors declare no conflict of interest.

References

[1] CBN DATA, 2020, Tmall International High-end Hair Care Industry Consumption Insight Report.

[2] Cui L, Jia Y, Cheng ZW, et al., 2016, Research Progress in Maintaining Skin Barrier-Lipid Secretion and Composition. The Chinese Journal of Dermatovenereology, 2016(06): 640-643.

[3] Wang X, 2007, Pay Attention to Scalp Problems, Make Hair Healthier. Health Horizon, 2007(08): 68-71.

[4] Zhang Q, Zhang Y, Wu JH, et al., 2019, Application of Common Active Ingredients in Scalp Care Products. Detergent & Cosmetics, 2019(11): 43-48.

[5] Brittany R, 2021, The Best Silicone-Free Shampoos. Healthline. https://www.healthline.com/health/beauty-skin-care/silicone-free

[6] Yu MY, Wang J, Cao GQ, 2019, Application of Silicone Oil in Cosmetics. China Cosmetics Review, 2019(08): 88-93.

[7] CBN DATA, 2019, “Anti-Loss Enthusiasts” Consumption Insight Report.