

EFFECTS OF SKIN LOTION PERFUME ON BUILDING AN ATTACHMENT FOR THE LOTION DURING CONTINUOUS USE

Saki NOJIMA^{*a}, Yasuhiko TANAKA^b, Ryoko FUKUDA^a

^a Faculty of Environment and Information Studies, Keio University, Japan

^b Kanebo Cosmetics Inc., Japan

ABSTRACT

The value of skin lotion can be realized through daily use. The continuous use of a skin lotion can lead to an attachment being formed for the lotion, and encourage its repeated purchase. In this study, we focus on the perfume of a lotion, and demonstrate through experiments how the perfume influences the building of an attachment for the lotion. Twenty young women who habitually use a skin lotion participated in the experiments. The participants tried out four lotions, made from the same ingredients but with different perfumes, and evaluated them subjectively, and selected a lotion for continuous use. They then used their selected lotion for two weeks, evaluating it every day. After this period, the participants were asked if and how their first impressions of the lotion and the perfume had changed, and how attached they had become to the lotion. The results showed that the perfumes used in the lotions influenced the participants' evaluation of touch, functional effects and psychological effects. Although all the skin lotions were made from the same ingredients, the participants thought they were different. Also, during the two-week usage of their selected lotion, their impressions of the lotion's perfume changed, and they formed an attachment for their selected lotion as a result. An attachment comprises many factors, and there are many differences among individuals. Further investigations are required to learn more about how people form an attachment for a lotion. The results can be applied to help consumers select an appropriate lotion.

Keywords: *cosmetic, attachment, perfume, long-term use*

* **Corresponding author:** c/o Dr. Ryoko Fukuda, Keio University Shonan Fujisawa Campus (SFC) Endoh 5322, Fujisawa, Kanagawa, 252-8520, Japan; e-mail: t06688sn@sfc.keio.ac.jp or ryoko@sfc.keio.ac.jp

1. INTRODUCTION

Skin lotion is one of the cosmetic products that people use for a protracted period of time, and most people make a careful decision when deciding which skin lotion to buy. This is because skin lotion is a basic skin product that is applied directly onto the skin, and which is more expensive than other cosmetic products. In practice, the customers decide upon which skin lotion to use based upon their own experiences, a plethora of information from commercial enterprises, and from other consumers. However, it is actually important for the consumers to use the lotion on a daily basis because the continuous use of a skin lotion lets users realize its effects. In a study by Senoo et al. (2002), an evaluation was made of the emotional changes caused by the use of skincare cosmetics, and the study revealed that an evaluator's criteria changes during long-term use. To the best of the authors' knowledge, sufficient research has not been carried out to bring about a change in the evaluation of a lotion during long-term use, such research being confined to first-time usage. Therefore, we focused on the attachment formed by using a lotion over a long term, and how the attachment for the lotion increased during continuous use.

In our previous research, 50 young female participants used skin lotions for two weeks and then evaluated the lotion daily. That research showed that people who see that the anticipated effects of a lotion have been realized, and that people who have been told by other people that their skin looks better, tend to have an attachment for a lotion. In addition, the perfume of the lotion was identified as one of the important elements in forming an attachment for a skin lotion.

The purpose of this study was to clarify what influences the perfume of a lotion has on forming an attachment for the lotion, and so the results regarding the perfume and the influence of the perfume are the main focus of this paper.

2. EXPERIMENTAL METHOD

2.1. Participants

Twenty female students between 19 and 21 years old, who habitually use a skin lotion, participated in these experiments.

2.2. Stimuli

Four lotions consisting of the same ingredients, but with different perfumes, were employed (Table 1). The selected perfumes were classified as "fruits," "luxury," "strong," and "rose," which are the most popular in the market. These products were supplied by Kanebo cosmetics Company. Four stimuli in the same bottles and cotton pads were placed on a table.

Table 1: Stimuli

Stimuli	Perfume
Stimulus 1	"fruits"
Stimulus 2	"luxury"

Stimulus 3	"strong"
Stimulus 4	"rose"

2.3. Procedure

Three experiments were carried out. In Experiment 1, the participants tried out four lotions and evaluated perfume, comfortableness, and their impression of these lotions subjectively. The participants then ranked the four lotions in order of: good perfume, comfortableness, and desire to use the lotion. In Experiment 2, the participants used their favorite lotion selected in Experiment 1 for two weeks, evaluating it every day. The same evaluation criteria as in Experiment 1 were employed for this second evaluation. After two weeks, Experiment 3 was carried out using the same procedure as Experiment 1. In addition, participants were interviewed and asked if and how their first impressions of the lotion and the perfume had changed, and how they became attached to the lotion.

2.3.1. Experiment 1

The participants applied the four lotions, and subjectively evaluated each lotion according to the evaluation items, as shown in Table 2. The evaluation items are dividing into those on the perfume of the lotion, and those on the effects of the lotion. After evaluating each lotion, the participants ranked the four lotions in the order of: good perfume, comfortableness, and desire to use the lotion. Then the participants were asked the reason they ranked the four lotions in the order of "desire to use." The lotion that each participant most wanted to use was adopted as the lotion that the participant used during the following two-week test (Experiment 2).

Table 2: Evaluation items

		very	comparatively	little	neither	little	comparatively	very	
while using the lotion	1	strong	7	6	5	4	3	2	1 weak
	2	fresh	7	6	5	4	3	2	1 dull
	3	tasteful	7	6	5	4	3	2	1 tasteless
	4	gentle	7	6	5	4	3	2	1 cool
	5	sweet	7	6	5	4	3	2	1 not sweet
	6	romantic	7	6	5	4	3	2	1 classical
	7	pleasant	7	6	5	4	3	2	1 unpleasant
	8	young	7	6	5	4	3	2	1 old
	9	clean	7	6	5	4	3	2	1 unclean
	10	luxury	7	6	5	4	3	2	1 cheap
	11	light	7	6	5	4	3	2	1 heavy
	12	soft	7	6	5	4	3	2	1 hard
	13	refreshing	7	6	5	4	3	2	1 persistent
	14	natural	7	6	5	4	3	2	1 artificial
	15	relaxed	7	6	5	4	3	2	1 not relaxed
	16	acid	7	6	5	4	3	2	1 non acid
	17	passionate	7	6	5	4	3	2	1 dispassionate
	18	elegant	7	6	5	4	3	2	1 inelegant
	19	vigorous	7	6	5	4	3	2	1 depressing
after using the lotion	20	comfortable	7	6	5	4	3	2	1 uncomfortable
	21	fragrant	7	6	5	4	3	2	1 not good perfume
	22	relievable	7	6	5	4	3	2	1 not relievable
	23	reliable	7	6	5	4	3	2	1 not reliable
	24	satisfactory	7	6	5	4	3	2	1 not satisfactory
	25	desire to use	7	6	5	4	3	2	1 not desire to use
	26	persistent	7	6	5	4	3	2	1 not persistent
	27	moisture-rich	7	6	5	4	3	2	1 moistureless
	28	like	7	6	5	4	3	2	1 dislike
	29	have an attachment	7	6	5	4	3	2	1 not have an attachment

2.3.2. Experiment 2

Over two weeks, the participants used the lotion they selected as stimuli in Experiment 1, and every day they evaluated the lotion according to the same evaluation items as in Experiment 1.

2.3.3. Experiment 3

After the two-week Experiment 2, the participants evaluated each lotion and ranked the lotions in order of: good perfume, comfortableness, and desire to use it again as in Experiment 1. After they did so, we revealed that the four lotions had the same ingredients, just different perfumes. Then the participants were interviewed and asked about any changes in their attachment for the lotions over the weeks, and about the effect the perfume of the skin lotion had on their feeling toward the lotion.

3. RESULTS

3.1. Experiment 1

3.1.1. Subjective evaluation

As a result of a factor analysis of the 10 evaluation items related to the effects of the lotion, nine evaluation items that had a factor loading of more than 0.40 on more than one factor were selected. Based upon the first eigenvalue and the attenuation, two factors were adopted. The first factor was interpreted as "affectiveness," and the second factor was interpreted as "functionality" (see Table 3). The factor of "affectiveness" contains the adjectives: "desire to use," "like," "have an attachment," "satisfactory," "fragrant" and "comfortable;" and the factor of "functionality" contains the adjectives: "persistent," "reliable" and "moisture". Table 3 shows the factor scores of each stimulus.

Table 3: Interpretation of factors

Factor	Adjective	Rotation Sums of Squared Loadings	Interpretation of factor
1	desire to use, like, have an attachment, satisfactory, fragrant, comfortable	5.06	affectiveness
2	persistent, reliable, moisture-rich	4.35	functionality

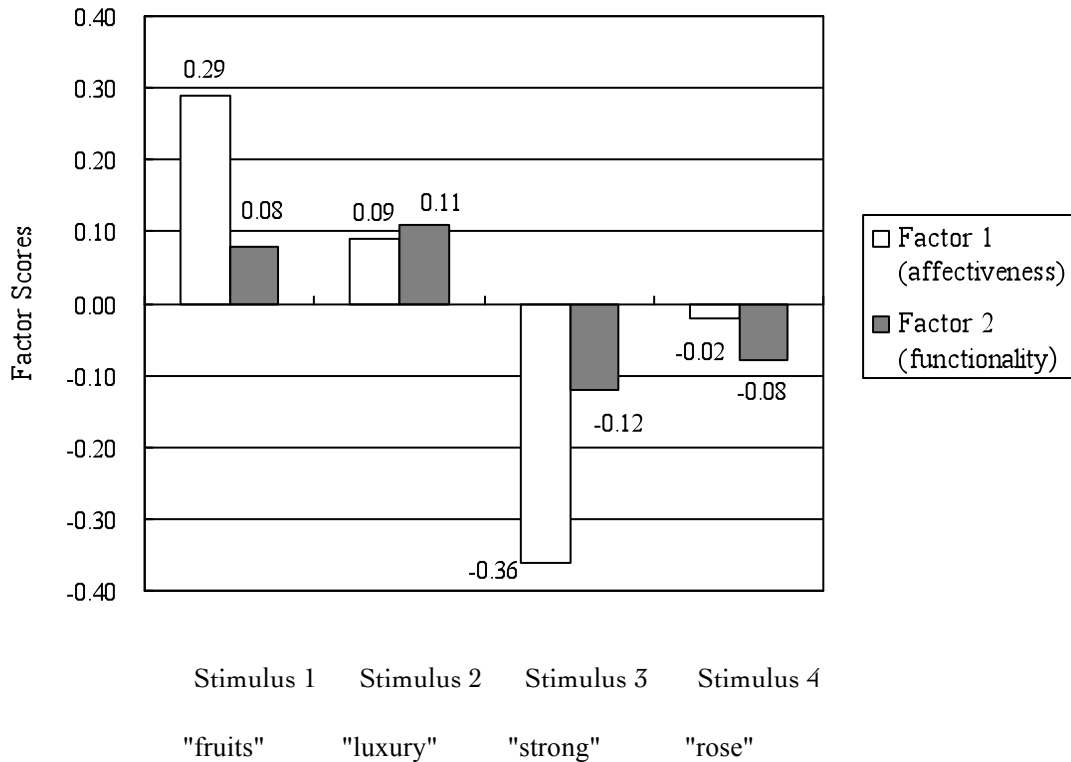


Figure 1: Factor scores

Although the lotions contained the same ingredients, the results of the subjective evaluations were different among the stimuli because of the differences in their perfume. In particular, Stimulus 1 indicated the highest score of "affectiveness" (Factor 1), and Stimulus 3 indicated the lowest score. But the scores for "functionality" (Factor 2) were not much different among the stimuli. The difference in the perfume of the lotions had some influence on the evaluations of the effects of lotions, especially in terms of "affectiveness." (Factor 1)

3.1.2. The reason for the selection of a lotion

The participants were asked the reason for their choice as to which lotion they wanted to use in the following two weeks (Experiment 2). One answer was that the "luxury" perfume made them feel "superior," and one answer referring to the effects of a lotion, was that the perfume of a skin lotion needs to have a relaxing effect because a skin lotion is used at the beginning and at the end of the day. For a lotion used in summer, the participants said they preferred a lotion that has the sense of being "powdery and refreshing," and that a perfume that is "not persistent or sweet" has a refreshing effect. In addition, because the lotions are used continuously, a skin lotion with a good perfume was preferred; and if people liked the perfume of lotion, there was a tendency to also like the lotion and feel more positive about the effects of the lotion, and so a lotion with a pleasant perfume was selected.

3.2. Experiment 2

16 participants completed the subjective evaluation over a two-week period. Based on these data, multiple regression analysis was made. The evaluation item "have an attachment" was assigned as dependent variable, and the other evaluation items were assigned as independent variables.

The results of multiple regression analysis are shown in the following multiple regression equation.

"have an attachment"

$$= 0.501 \times (\text{constant}) + 0.469 \times \text{"like"} + 0.377 \times \text{"reliable"} + (-0.316 \times \text{"gentle"})$$

$$+ 0.301 \times \text{"moisture-rich"} + 0.258 \times \text{"fragrant"} + (-0.127 \times \text{"natural"}) + 0.121 \times \text{"relaxed"}$$

$$+ (-0.112 \times \text{"romantic"}) + (-0.093 \times \text{"light"}) + (-0.058 \times \text{"acid"})$$

R-squared value for this model was 0.858 and adjusted R-squared value was 0.851. The analysis of a variance summary table is as shown below.

Table 4: Analysis of variance summary

Source	SS	df	MS	F	p
Multiple regression	353.554	10	35.355	128.860	0.000
Residual	58.441	213	0.274		
Total	411.996	223			

From the equation, it was revealed that during the two weeks, 10 out of the 28 evaluation items: "like," "reliable," "gentle," "moisture-rich," "fragrant," "natural," "relaxed," "romantic," "light," and "acid" affected the evaluation "have an attachment". It is worth noting that the evaluation of the perfume of a lotion — "gentle," "natural," "relaxed," "romantic," "light," and "acid" — affects the building an attachment for a lotion during continuous use of a lotion.

3.3. Experiment 3

3.3.1. Ranking order of "good perfume"

Using the lotion for two weeks resulted in some differences between Experiment 1 and Experiment 3. Comparing the results of Experiment 1 with those of Experiment 3, there were six participants who gave different answers regarding the lotion they used during the two weeks as stimulus in the order of "good perfume" lotion. The reasons two participants raised the order were that they had become used to the perfume, and become attached to the stimulus lotion, or that continuous use made an impression that was different than the one they had when they first tried the lotion. On the other hand, the participants who lowered the order replied that they did so because they had not developed an affection for the stimulus lotion. Two participants replied that a perfume that is not so strong is better. One of them was initially fascinated by the acid perfume of the lotion, but later found it too acid after

long-term use, so a lotion with a softer perfume was better because it seemed to be more comfortable. These results showed that continuous use may change the first impression of the perfume of the lotion.

3.3.2. Change in impressions of the lotion and development of affection for the lotion

Eight participants who formed a better impression of the lotion after using it for two weeks said the reason they had obtained a better impression was that the perfume of the lotion, although too strong initially, became less annoying with time; or that the original impression about the lack of moisture had receded, and that an absence of skin problems during the two weeks gave a good impression and increased reliability. Thus, continuous use of the lotion allayed some original misgivings. Two participants who received a bad impression pointed to the lack of moisture or a stickiness in the lotion, and furthermore, another two participants said they felt a persistent annoyance about the perfume of the lotion. All four participants who had bad impressions of the lotion showed no desire to use it further, while some participants developed an affection for the lotion because they liked its perfume.

The day most participants (five participants) changed their impression of the lotion was the seventh day. Around that day, four participants also developed an affection for the lotion. The day most participants (four participants) changed their impression of the perfume of the lotion and developed a liking for the lotion, likewise was the sixth or seventh day.

The factors of the lotions that affected participants the most were: refreshing, moisture, comfortableness, and perfume. The participants who developed an affection for the perfume of the lotion could be classified into two main groups. One group consisted of participants who liked the perfume from the beginning; and another group, who did not like the perfume much initially, but grew to like it through continuous use. Three participants originally liked the perfume, four participants became used to the perfume and felt at ease when smelling the perfume, and two participants grew to like the perfume after developing an affection for the lotion.

3.3.3. Influence of the perfume of lotion on building an attachment for the lotion

After the participants were told that the four stimuli used in the three experiments had the same ingredients, and that only the perfumes were different, they were asked whether the perfume of the lotions had any influence on their building an attachment for the lotions. All of them answered that the perfume of a lotion affected the building of an attachment for it. They cited such reasons as: "the perfume made a strong impression—such as in these experiments—and the different perfumes created a false sense and so they felt like four different stimulus lotions;" "if people use the lotion which has their favorite perfume, it makes them feel so good and have a positive psychological effect;" "people want to keep using a lotion that has a more favorable perfume, but on the other hand, people dislike using a lotion that has their least favorable perfume." In addition, when asked about the effects of the perfume of lotion that they preferred, the factors of: relaxation, refreshing effect, and comfortableness were mostly cited. The "affectiveness" is demanded as a function of the perfume of lotions.

4. DISCUSSION

4.1. The role of perfume in effecting the first impression of a lotion

It has been shown that when first trying a lotion, the perfume gives participants a prejudice for a particular lotion. The evaluations of the effects of four stimuli lotions in Experiment 1 were different for each stimulus lotion. The participants pointed out that: "a perfume of 'luxury' makes us feel 'superior,' and that "a 'floral' perfume and a subtle perfume gives us a feeling of 'relief'" and that "a perfume that is not persistent and a perfume that is not sweet have a refreshing effect." As described here, when one uses a lotion for the first time, the perfume influences one's estimate of the lotion, because one associates the effects of a lotion with the perfume of a lotion. Thus, different perfumes have a psychological effect and are associated with the effects of skin lotions, and one's impression of a perfume evokes the effects of skin lotions.

4.2. Relation between a lotion's perfume and the attachment for the lotion

The result of Experiment 2 and the difference in the results of Experiment 1 and Experiment 3 suggested that the perfume of a skin lotion influenced the building of an attachment for the lotion. In Experiment 2, some participants changed their impression regarding the perfume of a lotion after long-term use, and gained a good impression of the lotion; but some participants had a bad impression of the lotion. Thus, it can be seen that the perfume influences the impression of a lotion not only at the first time of use, but also over long-term use.

The evaluation of a lotion is mainly decided by the impression of the effects of the lotion. As the results of the experiments indicated, the impression of the effects of a lotion is affected by the perfume of the lotion. However, effects preceded perfume—if a lotion with a good perfume had not so good an effect, it was not appreciated. People who like the perfume of a lotion and realize the effects of a lotion, or who have no skin problems, tend to build an attachment for a lotion. Also people who find that the effects of a lotion exceed their anticipation of the lotion, and do not dislike the perfume of the lotion, also tend to build an attachment for the lotion. In Experiment 3, some participants did not like the perfume of a lotion, but became used to it, and built an attachment for the perfume of the lotion after long-term use. Some participants formed an attachment for a lotion because they liked the perfume of the lotion and developed an attachment for it. On the other hand, if people dislike the perfume of a lotion, they tend not to build an attachment for the lotion—even if they realize the effects of the lotion. Thus, in long-term use, some people become used to the perfume of the lotion and have a good impression of the lotion, but some dislike the perfume of the lotion and have a bad impression of it. Therefore, the perfume of a lotion has more than a little influence on building an attachment for the lotion.

4.3. Function of the perfume of a skin lotion

The results of three experiments show that the perfume of skin lotions has the function of "affectiveness." People tend to want to use the lotion that has a perfume they like because they touch the skin lotion and put on their skin every morning and evening, so people demand the effects of "relaxation," "refreshing" and also "relief" from the perfume of a lotion. It was also shown that different perfumes are required in different seasons and—especially in

summer—the perfume of a lotion needs to have a refreshing effect. Each perfume evokes some effects of a lotion as found in the results of the experiments, so when producing skin lotion, it is important to select the appropriate perfume to enhance the effects of a lotion.

5. CONCLUSION

This study was aimed at clarifying what influence the perfume of a lotion has on a person forming an attachment for the lotion. The results showed that the perfume of a skin lotion affects one's first impression of a lotion, and the effects of the lotion that users realize. Different perfumes cause different psychological effects among users, because people associate the effects of a skin lotion with its perfume. In addition, along with preference, moisture level and reliability, an impression for the perfume of a lotion was very closely related to building an attachment for the lotion during two weeks. Thus we consider not only function but also perfume of a lotion when we evaluate a lotion.

It was confirmed that the importance of learning what effects the perfume of a lotion evokes. Further it is needed to clarify what perfumes are preferred among consumers for the purpose of making products that meets consumers' preferences.

REFERENCES

1. Senoo, M., Takemoto, Y., Iida, I., Sugaya, Y., Jingu, H.: Emotional Change Caused by the Use of Skin-Care Products, *Journal of Society of Cosmetic Chemists of Japan*, Vol. 34, No. 3, pp. 276-272, 2000.
2. Senoo, M., Takemoto, Y., and Jingu, H.: Sensory Evaluation of Skincare Cosmetics with Onomatopoeia and Exclamation, *Journal of Society of Cosmetic Chemists of Japan*, Vol. 5, No. 2, pp. 112-117, 2001.
3. Senoo, M., Takemoto, Y., Sugaya, Y., and Jingu, H.: The Change of Sensory Evaluation in Daily Use of Skincare Lotion, *Japanese Journal of Sensory Evaluation*, Vol. 6, No.2, pp. 116-120, 2002.
4. Shoji, K., Taguchi, S., and Terajima, Y.: Mere exposure effect of perfume (2) : Relation between the preference change and impression of perfume, *The Japanese Journal of Taste and Smell Research*, Vol. 13, No.3, pp. 617-620, 2006.