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Analysis of Perfumes Used to Create Fragrances that Give a Sense of Hospitality

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Abstract: Japan has a hospitality culture called “*Omotenashi*”. In Japan’s classical literature, there are many songs and stories about fragrances. In addition to burning incense in Buddhism rituals, Japanese created a unique world called “*Kodo*”. This indicates that the Japanese have a deep history with scents. Regarding the scent of hospitality, it is necessary to consider the preference of the scent when greeting people. In a previous study, we conducted a questionnaire survey of 60 Japanese males and females using 5 different fragrances and 5 different note types and examined the results. In this experiment, we conducted a questionnaire survey of 58 Japanese males and females based on the SD method using 6 different perfumes and 2 different note types. We examined the results in this and the previous study in order to understand preferences for fragrances that conjure a sense of hospitality. We conducted factor analysis and extracted factors representing the feeling of “*Omotenashi*” from the perfumes. We analyzed the scent of each perfume based on these factors. Moreover, it was suggested that the impressions made by of perfume is different from the note types representing attributes of perfume. From the results of this experiment, as a result of examining the scent factors that bring about a feeling of hospitality, perfumes with a fresh, pleasant and graceful sensation were suggested to be the most effective in bringing about this feeling. In this paper, we reported on our research of fragrances that evoke in “*Omotenashi*”, or Japanese hospitality. In the future, we will continue to research the sensibilities that perfumes give to people and also propose a unique “perfume method (*Kosuido*)” for the purpose of researching the design of perfume.

Keywords: *Japanese hospitality, SD method, factor analysis, fragrance, sensibility*

1. INTRODUCTION

The Japanese people take the spirit of *Omotenashi* (hospitality) seriously. Leading up to the 2020 Olympic Games in Tokyo, the word “*Omotenashi*” has been introduced as one aspect of the Japanese spirit and has sparked much discussion. Japan’s *Omotenashi* is not just about providing service. It is better understood as an important bidirectional action meant to make everyone feel happier, according to Isao Kumakura[1].

The impact of fragrance on humans is immense. Yoshihiko Akakabe spoke of the utility of perfume: “Fragrance goes beyond personal use as a perfume; parcels and building spaces can also be infused with fragrance.”[2]

It is thought that the way people experience fragrance differs based on their age, gender, environment, and lifestyle habits. We conducted a questionnaire based on the SD method in our previous study[3][4] into fragrances that evoke *Omotenashi* of 60 Japanese males and females, using five commercially available perfumes. The results show that of the five perfumes, the ones that were evaluated the highest were the chypre notes of Mitsouko and the woody notes of Samsara. Dzhandzhugazova said of the importance of fragrances as “The innovate hotel marketing mix called Seven Sensual Notes (sight, hearing, smell, taste, touch, intuition, impressions) of hospitality provides a new vision of the marketing mix and its

correlation with the sensual share of a human being,” [5] At the same time as this research, there were experiments using three types of fragrance [6] and ten essences of a fragrance[7], but we used six commercially available perfumes.

For this research, we tested the hypothesis that perfume is dependent on its note category. We focused on two note categories: chypre and woody. We used two different perfumes and two more perfumes with the same note categories for each group, resulting in a total of six perfumes. We conducted a questionnaire based on the SD method of 58 Japanese males and females. Our objective was to quantify what makes a fragrance bring up feelings of *Omotenashi* by extracting factors through factor analysis of the results.

2. METHOD

2.1 Perfume fragrance notes

“Note” is a word used to differentiate the attributes of fragrances. As we introduced in our previous study [3][4], it is understood that there are 11 representative notes [8]. Here are the six types of perfume and the two notes that we used:

1. Woody notes: understated, delicate, mysterious, quiet, calm

2. Chypre notes: sophisticated, elegant, decorous, chic, mature

2.2 The perfumes used in the experiment and their fragrances

The six types of perfumes (1 through 6) used in this research and their note categories are listed below [8].

- (1) Polo Ralph Lauren : Chypre note
- (2) Kelly Calèche Hermès : Chypre note
- (3) L'eau D'Issey Pour Homme Issey Miyake : Woody note
- (4) Terre D'Hermès : Woody note
- (5) Mitsouko Guerlain : Chypre note
- (6) Samsara Guerlain : Woody note

2.3 Experiment participants

Participants in the experiment used the six types of perfume and gave their impressions of each one in the questionnaire. Participants included 31 males and 27 females for a total of 58 people. The average ages were 23.0 for males and 22.7 for females.

2.4 Experiment method

The experiment was conducted in a university classroom. The experiment method used was the same as in the previous study[3][4].

2.5 Data analysis method

For this paper, we conducted factor analysis on the same 22 adjectives used in previous study[3][4] to extract the factors that make up a perfume's fragrance.

3. RESULT

3.1 Evaluation of the fragrances that gave a sense of Omotenashi

Fig. 1 illustrates which fragrances gave off a sense of *Omotenashi*. The vertical axis indicates the seven average ratings; the horizontal axis indicates the six different perfumes. The perfume names are (1) Polo, (2) Kelly Calèche, (3) L'eau D'Issey, (4) Terre D'Hermès, (5) Mitsouko, and (6) Samsara.

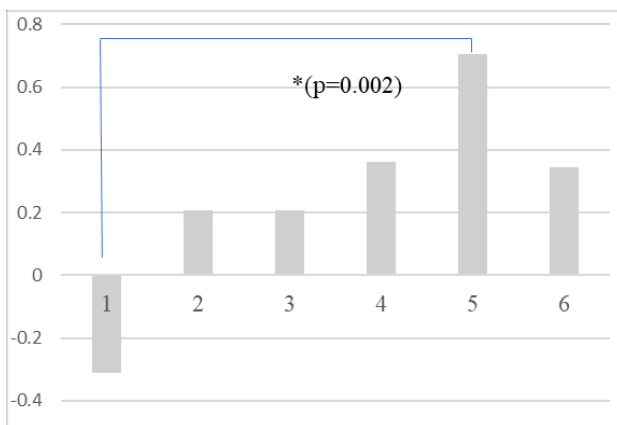


Figure 1: Evaluation of the Fragrances that Gave a Sense of *Omotenashi*

The bar graph in Fig. 1 shows that of the six perfumes, the one with the highest marks for giving a sense of *Omotenashi* is (5) Mitsouko. The second highest is (4) Terre D'Hermès, and the third is (6) Samsara. To check the differences in average evaluations of fragrances giving off a sense of *Omotenashi*, we conducted one-way analysis of the variance, and found that the p value was a significant difference of 0.0115. Also, using the Tukey HSD (Tukey's "Honest Significant Difference") in multiple tests resulted in a critical p value of 0.002 between the chypre notes of (5) Mitsouko, and (1) Polo ((5) Mitsouko > (1) Polo). We conducted factor analysis on the data of this experiment using function fa from psych package R. The estimation method used was the maximum likelihood estimation (MLE).

3.2 Determining the number of factors

We conducted the Scree Test to distinguish the number of factors in the factor analysis. Through the Scree Test, we found 5 factors. The eigenvalue was determined through function fa from psych package R.

3.3 Factor loading and cumulative contribution ratio

Table 1 shows the factor loading based on the promax rotation. The cumulative contribution ratio of the five factors was 55%.

Table 1: Factor Loading Matrix

	Factor1	Factor2	Factor3	Factor4	Factor5
Clear	0.868	-0.005	0.093	-0.053	-0.138
Refreshing	0.801	0.222	0.072	-0.16	-0.167
Young	0.666	0.118	-0.326	0.141	-0.124
Clean	0.619	0.122	0.124	-0.063	0.041
Light	0.582	-0.031	-0.118	0.034	0.158
Sensual	-0.422	0.027	0.229	0.307	-0.185
Pleasant	0.125	0.946	0.034	-0.126	-0.029
Comfortable	0.082	0.889	0.042	-0.099	0.04
Like	0.078	0.882	0.061	-0.057	-0.04
Positive	0.115	0.432	0.058	0.091	0.273
Adult-like	-0.026	0.051	0.754	-0.149	-0.017
Mature	-0.216	0.072	0.733	-0.079	-0.087
Graceful	0.289	0.023	0.57	0.241	0.211
Elegant	0.28	-0.04	0.537	0.448	0.131
Masculine	0.091	0.197	0.008	-0.738	-0.134
Sweet	0.009	0.097	-0.111	0.637	0.039
Dry	0.203	-0.072	-0.02	-0.293	0.113
Gentle	-0.185	0.231	-0.106	0.373	0.682
Calm	-0.024	0.149	0.051	0.258	0.604
Strong	0.011	-0.031	0.347	-0.001	-0.441
Oriental	-0.2	0.117	0.172	-0.336	0.369
Powdery	0.088	-0.132	0.133	-0.111	0.337

3.4 Factor naming

In the previous study[3][4], there were three factors. The first factor was “elegance”. The second was “freshness”. And the third factor was “pleasure”. In this research, we extracted five factors from the results of the promax rotation of the factor loading matrix. Those factor names are: first factor, “freshness”, second factor, “pleasure”, third factor, “elegance”, fourth factor, “sweetness” and fifth factor, “calmness”. The factor that was No. 1 in the previous study[3][4] was No. 3 this time. We consider that these results came about because the chypre notes and woody notes used this time and the ones used previously[3][4] are both regarded as elegant fragrances.

3.5 Plotting factor scores

Figures 2 through 4 showed a plotting of the factor scores. (5) Mitsouko showed the highest evaluation, but as shown in figure 2, when it came to the first factor of “freshness” and the second factor of “pleasure,” it scored in the middle with “pleasure” and low for “freshness”. Also, the second-ranking (4) Terre D’Hermès had a middling rank for “freshness” and was low for “pleasure”. The third-ranking (6) Samsara was in the middle for both “freshness” and “pleasure”. (1) Polo scored high with “freshness”, and was middling with “pleasure”. (3) L’eau D’Issey scored high for both “freshness” and “pleasure”. Also, of the six perfumes used this time, the one scoring high with both “freshness” and “pleasure” was (2) Kelly Calèche.

From the factor score plotting on figure 3 of the first factor, “freshness”, and the third factor, “elegance”, we saw that with (5) Mitsouko and (1) Polo, which had significantly different mean values, (5) Mitsouko scored low on “freshness” and high on “elegance”, while (1) Polo had both “freshness” and “elegance”. Also, in figure 4, the factor score plotting of the second factor, “pleasure”, and the third factor, “elegance”, showed that both (5) Mitsouko and (1) Polo were in the middle for “pleasure”, but (5) Mitsouko won out when it came to “elegance”.

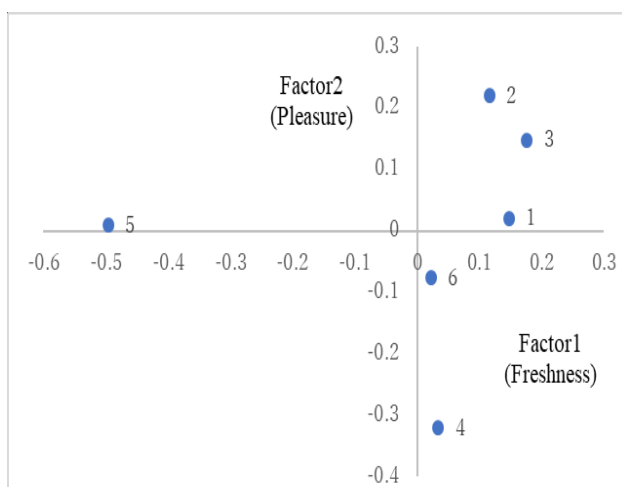


Figure 2: Freshness vs. Pleasure

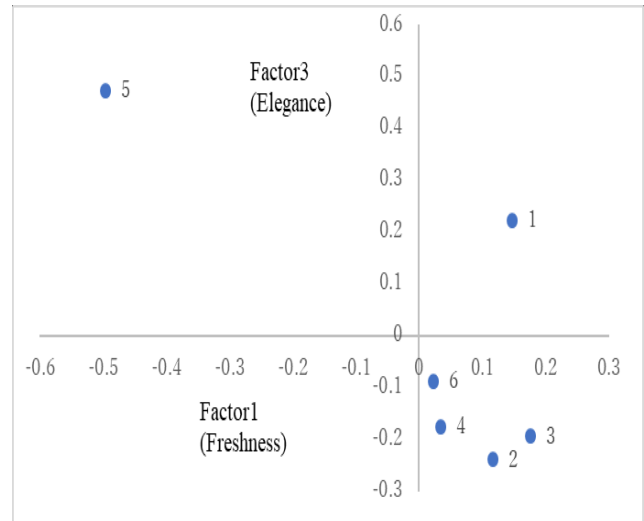


Figure 3: Freshness vs. Elegance

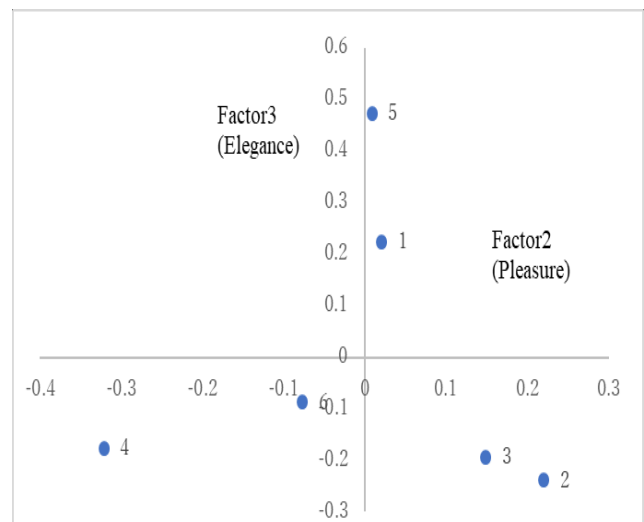


Figure 4: Pleasure vs. Elegance

4. DISCUSSION

We used six commercially available perfumes in this experiment to analyze the impressions for a sense of *Omotenashi*. We used (5) Mitsouko chypre notes and (6) Samsara woody notes in previous study[3][4], and they were evaluated highly for a sense of *Omotenashi*. (1) Polo and (2) Kelly Calèche have the same chypre notes as (5) Mitsouko. (3) L’eau D’Issey and (4) Terre D’Hermès have the same woody notes as (6) Samsara. This time, we had three chypre note and three woody note perfumes for a total of six. The results showed that the scent evaluated as having the most sense of *Omotenashi* was the chypre notes of (5) Mitsouko. The second highest was the woody notes of (4) Terre D’Hermès. If we look at the results of this experiment as related to the differences in woody notes and chypre notes, woody notes scored high on “freshness” and low on “elegance”, while chypre notes scored high with both “freshness” and “elegance”.

Comparing the perfumes with the most significant gap in mean value, (1) Polo and (5) Mitsouko, figure 2 showed that (5) Mitsouko had no “freshness” and was in the middle for “pleasure”, while (1) Polo had “freshness” and was in the middle for “pleasure”. Looking at figure 3, (5) Mitsouko had no “freshness,” but had “elegance,” while (1) Polo had “freshness” but was lower than (5) Mitsouko on “elegance.” Looking at figure 4, (1) Polo and (5) Mitsouko were both middling with “pleasure”, but (5) Mitsouko outranked (1) Polo in “elegance”. We were able to see that the “elegance” in the chypre note had a strong connection to the sense of *Omotenashi*, but there was a difference in the level of *Omotenashi* even within the same chypre note perfumes. In this research, we found that a gap appeared with the woody notes where “freshness” was felt, but not “elegance”. These results indicated that the characteristics of the notes were affected by the individuality of the perfumes.

Future research challenges include conducting surveys targeting middle-age and elderly people to see what fragrances conjure *Omotenashi*, what factors are involved, and what sort of influence do the changing seasons have on the feeling of *Omotenashi*.

This research report focused on the sense of *Omotenashi* in fragrances. In the future, we will continue to research people’s sensitivity to perfumes and perfume-making designs as we advocate for creation of unique perfume methods (*Kosuido*).

5. CONCLUSION

This research included 58 people cooperating with an experiment involving six types of perfume to evaluate the sense of *Omotenashi* each one gave. Factor analysis of the SD data in 22 categories was analyzed, and the factors behind the evaluations were inspected. The results of the experiment did not agree with our hypothesis about the sense of *Omotenashi* in a fragrance being tied to note type. Instead, it was understood that “elegance” was a major influence.

REFERENCES

- [1]I. Kumakura, K. Goto; *Omotenashi* and Manner, Japanese Food Culture Booklet 2, Japanese Food Registered as UNESCO Intangible Cultural Heritage, SHIBUNKAKU Publisher, p.4,(2016) (in Japanese)
- [2]Y. Akakabe; The Wonder of Fragrances – The Effect on Humans, Fragrance Journal Publisher, p.58(2016) (in Japanese)
- [3]H. Nakagawa, N. Kuwahara; A Study on the Odor in “*Omotenashi*”, Japanese Hospitality, LNCS, vol. 10286, pp.324-335(2017).
- [4]H. Nakagawa, N. Kuwahara; A study on the design of the scent of hospitality, Human Interface Symposium 2017, pp. 243-246, 2017(in Japanese).

- [5]Elena A. Dzhandzhugazova, Ekaterina A. Blinova, Liunova, Liubov N. Orlova and Mariannna M. Romanova : Innovation in Hospitality Industry, INTERNATIONAL JOURNAL OF ENVIRONMENTAL & SCIENCE EDUCATION, vol. 11, no. 17, pp. 10387-10400(2016).
- [6]A. Kikuchi, H. Yamaguchi, M. Tanida, T. Abe, S. Uenoyama; Effects of Odors on Cardiac Response Patterns and Subjective States in A Reaction Time Task, vol.52, pp.74-82(1992).
- [7]Y. Nakano, A. Kikuchi, H. Matsui, T. Hatayama, K. Maruyama; A Study of Fragrance Impressions, Evaluation and Categorization, vol.52, pp.83-90(1992).
- [8]M. Shinma; The Golden Rule of Perfume, Harashobo Publisher, pp.30-57(2010), (in Japanese)