

A new Fragrance language: intercultural knowledge and emotions

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Abstract

For the first time, a full scale experts and consumers study was carried out on the same products using a Flash profile methodology.

9 perfumes were evaluated with the help of 5 expert perfumers and 300 consumers coming from three countries (China, France and USA)

The perfumes were evaluated using a Flash profile methodology on the basis of 4 descriptive categories : Olfactory sensations, Mental images, Emotions, Associated lifestyles.

This paper presents the methodology and how it can be used to create a link between the perfumers words and the consumers views. This is done with only a limited translation assistance and without restraining the study to the sole olfactory terms of a predefined language.

Introduction

Passing on the fragrance enchantment with words is not obvious. Nevertheless words are always present during a perfume creation process, from the marketing brief to the beauty consultant speech.

However, none of these specific discourses is fully satisfactory or understandable. The expert approach is rarely suitable for the general public: talking about an olfactory family has no special meaning for the consumer. While at the same time the beauty consultant speech is rarely a fully emotional one.

This paper will present a methodology which is not product specific but answers this very common problem of linking fragrance industry's discourse to consumers' perception. Our objective is to reduce the lack of understanding between perfumers who often use creative or analytical words and the consumer's perceived feelings and naïve description of proposal products. As others have said before, "Fragrance is not a basic human need, consequently, it must trigger an emotional reaction and incite desire A desire that is by nature unlimited". Our methodology contributes to the exploration of this desire.

A preliminary study was undertaken in a previous work [1]. The descriptive work of 90 French consumers was compared to the semantic description of 6 French professional perfumers. The perfumes were 12 women's perfumes. The methodology used was Flash Profile. The study demonstrated the feasibility of the method while at the same time providing

insights for comparing the professional perfumers and naive consumers' descriptions. For this present study, our objective was to use a similar methodology on a larger scale. We planned a full scale consumer study in three very different cultural countries using different languages (China, France and USA) while at the same time working with professional perfumers in two different countries (France and USA). We also decided to investigate not only the olfactory description of the products, but also the mental images and emotions associated to these perfumes. The objective was to compare on the one hand these mental associations to the olfactory semantic description and on the other hand the cultural differences between the three countries.

Materials and Methods

Products

9 selective perfumes (6 women's perfumes and 3 men's perfumes) were evaluated during the study (Table 1).

CODE	Generic Perfumes classification
A	Floral
B	Floral, fruity, sensual
C	Oriental
D	Fresh, fruity
E	Green chypre
F	Sweet chypre
G	Aromatic fresh
H	Floral woody
I	Aromatic, woody, powdery

Table 1. Generic Perfumes classification

Both panels (experts and consumers) evaluated strictly the same products. One day before each evaluation, blotters were dipped into half ounce bottles' fragrances. These fragrances were diluted in ethyl alcohol. Then blotters were air-dried and placed in their corresponding bottles.

Dipped samples were presented simultaneously (see Flash profile methodology) and evaluated in an anonymous way. Consumers and perfumers were given no indication on the perfumes brands and names.

Perfumers

The expert panel was composed of 5 professional perfumers (3 from the USA and 2 from France) belonging to the same company and thus with a similar descriptive background and experience.

Consumers

The study was led in 3 countries: China, France, and United States. In each country, the panel was composed by 100 consumers: 70% were women aged from 18 to 55 years old and 30% were men aged from 18 to 55 years old. They all were heavy users of perfumes but none of them had any experience in analytical sensory description and in perfumes descriptive profiling.

Flash Profile methodology:

The Flash Profile [2] [3] [4] [5] is a quick sensory descriptive method derived from Free Choice Profiling [6] [7]. It was initially developed as a way to rapidly position products according to their major sensory differences. It does not rely on a consensual semantic description but allows more semantic flexibility in order to gain development time. As a result, it can be used to rapidly assess a whole set of stimuli and is able to provide insights into the way subjects perceive factors under investigation by allowing a quick access to the overall sensory structure of a sample set. It is therefore a perfect tool to be used by professional experts having strong individual vocabulary.

In the usual Flash profile methodology, each subject is asked to compare and describe the differences among the products using a ranking protocol on their own personal attributes.

We slightly adapted the methodology in the following way:

All sessions were booked for a half-day period. Sessions were carried out on separate days and separate locations in each country. All the consumers' evaluations took place in sensory booths. After a short presentation of the Flash profile methodology, the perfumes were first given one by one to the assessors using a monadic sequential procedure. Consumers and experts were asked to describe, using their own words and sentences, the sensations they perceived for each perfume on the 4 following topics : olfactory sensory description, mental images, emotions, man's and woman's types and lifestyles.

They were then asked to choose, for each of the four categories, 2 to 4 words or sentences among the previously generated ones. Words had to be chosen according to their discriminant ability on the 9 perfumes and had to be discriminant enough to allow a ranking of the samples. Participants were then given the 9 perfumes simultaneously. They were asked to compare the products using a ranking protocol on these 4 (maximum number) individually chosen attributes for the four categories (olfaction, images, emotions, and lifestyles). Ties were allowed and judges could re-evaluate the samples as much as they liked. The whole Flash Profile procedure took between 2 to 4 hours for each participant.

The involved statistical analysis mainly consisted in Analysis of Variance, Cluster analyses, Principal Component Analysis and Generalized Procrustean Analysis (GPA) [8]. The GPA is a specifically statistical method well adapted to the Free Choice and Flash profile techniques. It allows the calculation of a consensual perceptual sensory map based on the statistical treatment of the individual sensory configurations obtained for each subject.

The consumers and experts Flash profiles were separately dealt with. The data from the two profiles were collected on Microsoft Excel® spreadsheets. GPA was applied to the data from Flash profile to assess the consensus between assessors' sensory maps.

Principal Component Analysis plots of the perfumes and of the attributes on the circle of correlations were calculated to describe inter-product differences when they exist.

In addition to this, consumers were also clustered using RV coefficients. The obtained consumers groups were separately treated. Cluster analysis on the panel means and consensus were performed in order to compare the product clusters obtained by both perfumers and consumers procedures. Cluster analysis was performed on both terms and products following GPA to help understand products discrepancies and semantic interpretations.

All multidimensional data treatments were performed using the XLSTAT® add-in for Microsoft Excel® [9], with the exception of GPA and RV calculations which were performed on Matlab® programs.

Results and discussion

The main results which may be openly presented at this time are the following :

General methodological and semantic results

- 1- Similar to what was observed with the previous Flash profile consumers studies [10] [11], all consumers and experts were able to use the Flash profile methodology. Moreover, no consumers had trouble finding and imagining mental images, emotions or associations with the different perfumes. This is a confirmation of the highly imaginative and very evocative potential of fragrances.
- 2- The number of terms and expressions freely generated by consumers in each category ranged from 2 to 6, thus showing only a limited variability.
- 3- On the other hand, the nature of idioms and expressions demonstrated a great variability, going from simple words to complex and fully detailed phrases (Table 2).

Examples of simple idioms	Examples of more detailed phrases
Happy	Strong outside soft inside
Fruity	A mixture of cantaloupe and orange
Harsh	Very clean clothes with light fragrance
Sexy	Secreting saliva after trying this smell
For girl	A garden full of blooming flowers in vernal sunshine
Relaxed	An elegant lady is enjoying music and having a cup of tea in a coffee bar
Calm	Older gentleman on bus
Heavy	A person is walking alone under the dark street lamps. He/She is trying to recover from a recent fateful shock
Elegant	Well-educated mature ladies seeking for high living quality
Noisy	Woman in bubble bath surrounded by candles
Maid	Walking on clouds
Ordinary	Walking thru high-end jewellery store

Table 2. Examples of simple and detailed idioms and phrases used by consumers to describe the perfumes and mental associations.

In addition to that individual variability, they were a lot of recurrent items in the three countries (for example fruity, happy, garden) but there was also some variability between countries, with specific associations between countries and evoked thematic (Table 3).

Country	Recurrent specific thematic
China	White collar ladies and men
USA	Shower

Table 3. Examples of thematic more specifically associated with a particular country.

4- The descriptive olfactory terms used by the different perfumers were much more similar than observed in the previous study. This is certainly due to the fact that the perfumers in the present study worked in the same company and thus probably developed and used a very similar language.

Descriptive Flash profile results

Generalized Procrustean Analysis and cluster analysis carried out on Flash profile results for the three countries led to highly detailed information regarding the consumers clusters and perceptions.

Here are for example some of the main results which were made available:

1- Products sensory and descriptive maps were obtained for each country (Figure 1)

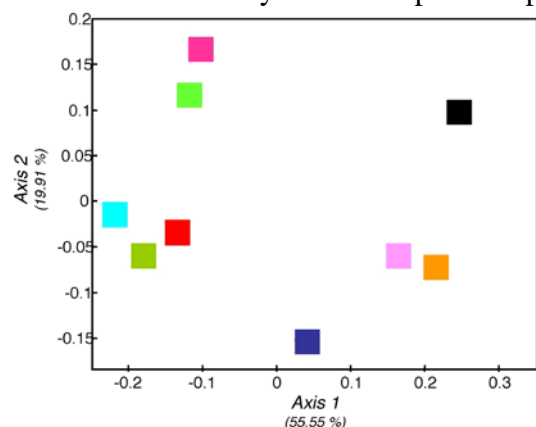


Figure 1. Example of products consensual sensory map after GPA (products have been color coded). Olfactory sensory data for all US consumers.

2- Products maps and products clusters were compared and analyzed between countries (Figure 2)

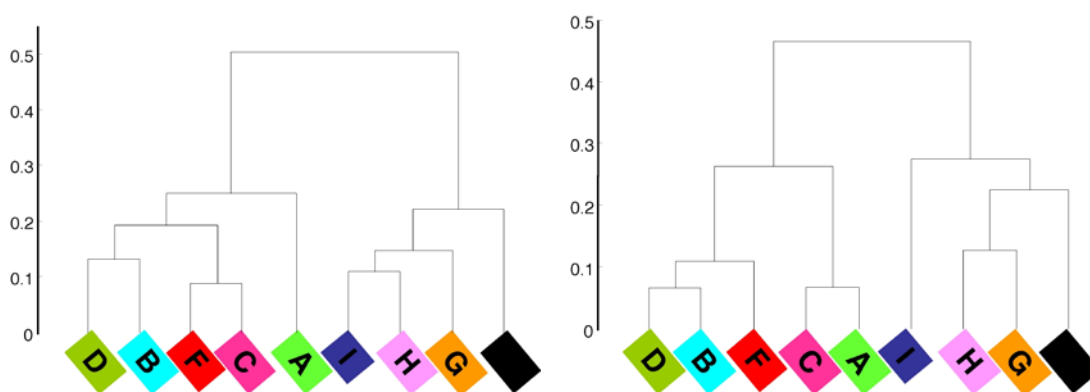


Figure 2. Examples of the results of the products hierarchical cluster analysis carried out on products after GPA (olfactory sensory consumer data). China results are on the left, US results are on the right.

3- Descriptive terms were gathered together based on their uses both for the consumers (Figure 3) and the expert perfumers (Figure 4).

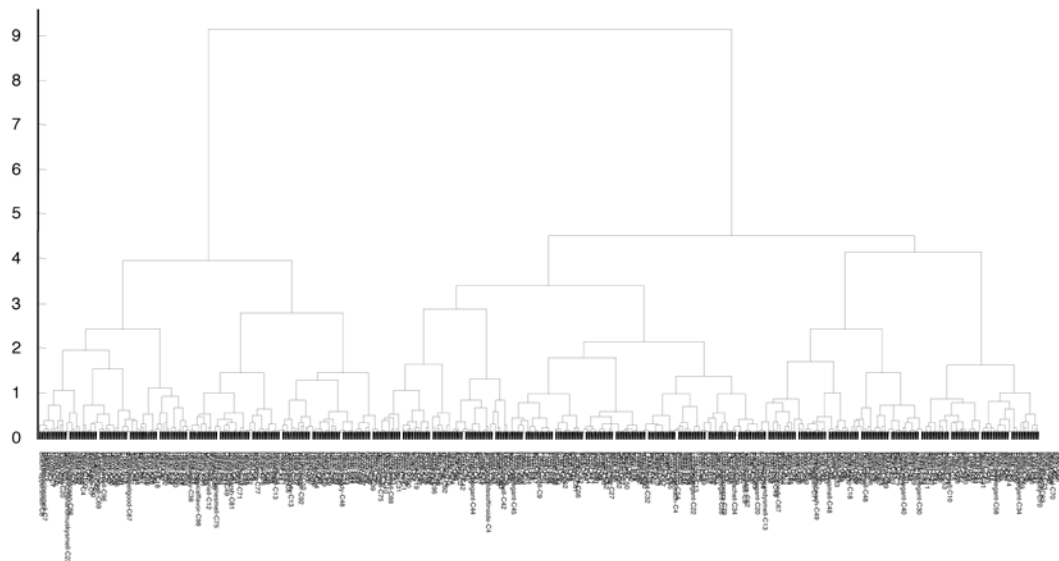


Figure 3. Example of the results of the attributes hierarchical cluster analysis carried out on olfactory sensory data for all Chinese consumers.

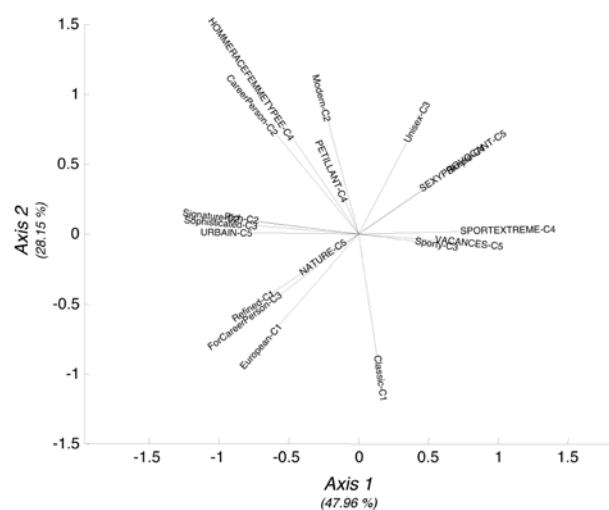


Figure 4. Example of the attributes plot for Lifestyle data (expert perfumers).

4- Consumers were put together and clustered in each country based on their use of the words on the perfumes (Figure 5). Each specific consumer group was analysed using the combination of products maps and descriptive terms (Figures 6 and 7).

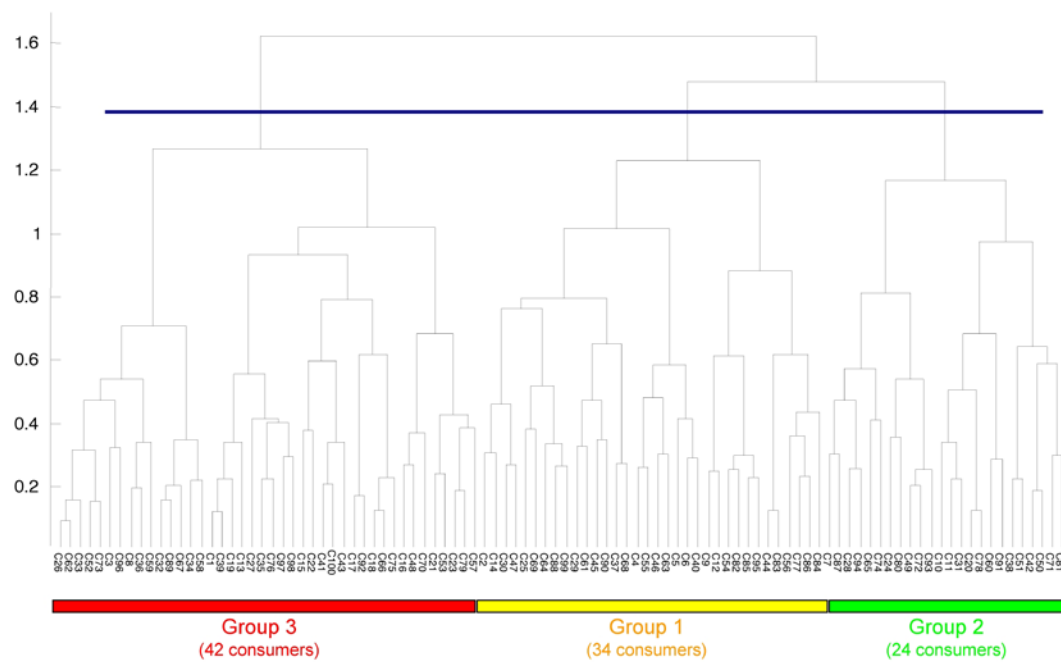


Figure 5. Example of consumers' clustering (3 groups). Mental Image data for Chinese consumers.

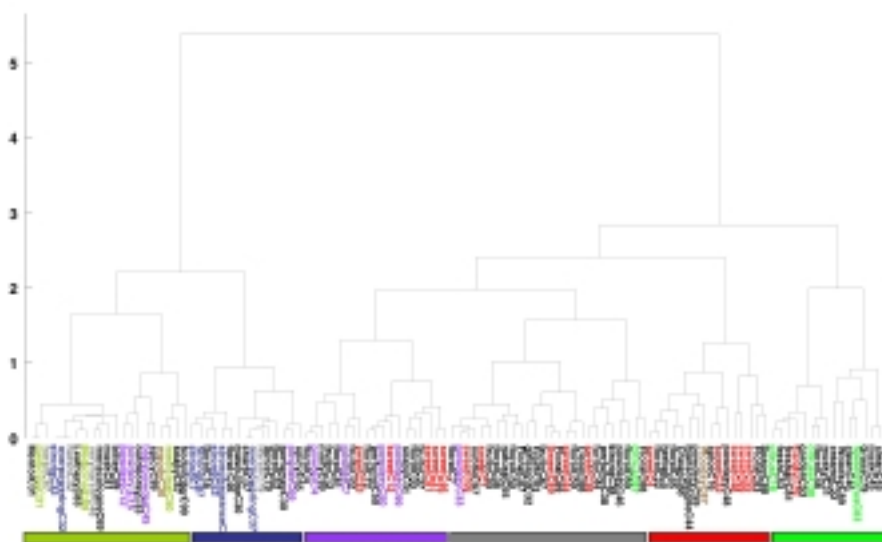


Figure 6. Example of attributes' clustering. Olfactory sensory data for one of the US consumers group.

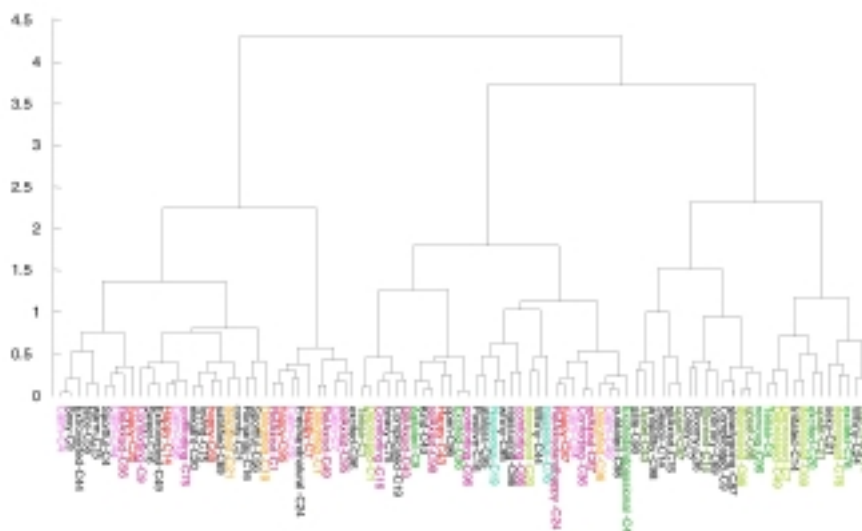


Figure 7. Example of attributes' clustering. Emotion data for one of the Chinese consumers group.

5- All the consumers results have been compared to the perfumers results (Figure 8).

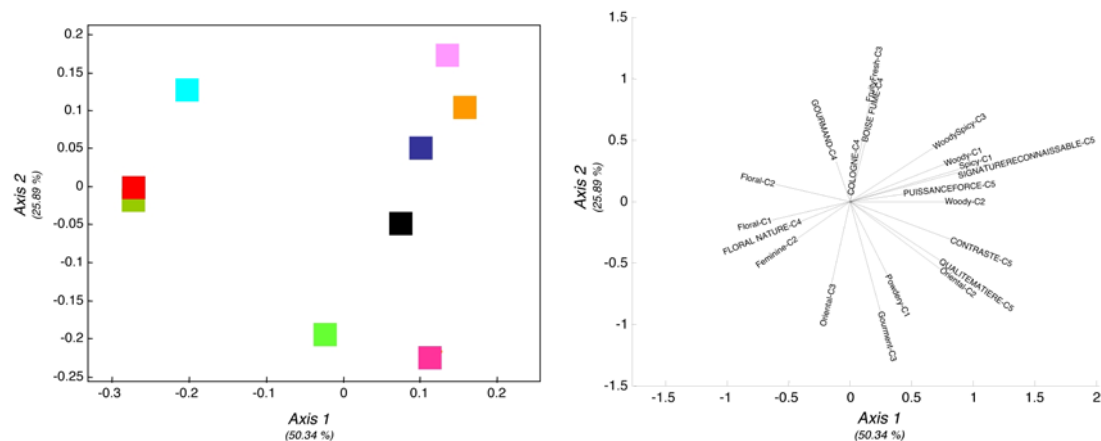


Figure 8. Products olfactory sensory map (left) and attributes plot (right) on expert data.

Conclusion

To conclude, a perfume is an emotion but it is not necessarily an olfactory one.

This study shows how it is possible to pass on the perfume universe specificity on the basis of a “consumer language“, with descriptive terms but also emotions and images, and not only on a predefined “coded” language.

The quick and highly reactive methodology we used allowed us to get a huge amount of information in a relatively short time. The main and very original results are 12 highly

informative consumers maps of the relative proximities of the products taking into account olfactory perceptions, emotions, images and lifestyles for the three countries.

Those consumer maps were compared to the expert perfumers similar maps.

In addition to that, the cultural differences we spotted led to specific terms generation for each country and revealed that some common items (for example fruity or happy) directed towards different significations for French, Chinese or American consumers.

The cultural differences were of course more pronounced regarding the evoked emotions and images.

For the first time, we were able to compare on the same underlying products maps, the main specificities regarding expert perfumers and French, Chinese and American consumers at four different interpretative levels.

This gave us several added values:

- Better understanding the consumers' mind and specificities
- Creating a link between the perfumers' world and the consumers' views.
- Introducing a new communication link between the creative and the development team and between the fragrance houses and the consumers.
- Using people from different countries, languages and experiences; and being able to compare them even with limited translation assistance.

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Reference

1. Gazano G, Ballay S and Sieffermann JM: Transposing fragrance olfactory research into the consumers' worlds and words. IFSCC 24th Congress, October 16-19, Osaka, 2006
2. Sieffermann JM: Le profil Flash – un outil rapide et innovant d'évaluation sensorielle descriptive. Proceedings of AGORAL 2000, XIIèmes rencontres "L'innovation: de l'idée au succès", Montpellier, France, pp 335-340, 2000
3. Sieffermann JM: Flash profiling. A new method of sensory descriptive analysis. In AIFST 35th convention, July 21-24, Sidney, Australia, 2002
4. Delarue J, Danzart M, Sieffermann JM: Flash profile gives insights into human sensory perception. In 5th Meeting of the International Multisensory Research Forum, June 2-5, Sitges (Barcelona), Spain, 2004
5. Delarue J, Sieffermann JM: Sensory mapping using Flash profile. Comparison with a conventional descriptive method for the evaluation of the flavour of fruit dairy products. Food Quality and Preference 15:383-392, 2004
6. Williams AA, Langron SP: The use of free-choice profiling for the evaluation of commercial ports. Journal of the Science of Food and Agriculture, 35, 558-568, 1984
7. Williams AA, Arnold GM: A comparison of the aromas of 6 coffees characterized by conventional profiling, free-choice profiling, and similarity methods. Journal of the Science of Food and Agriculture 36: 204-214, 1985
8. Gower JC: Generalized procrustes analysis. Psychometrika, 40, 33-51, 1975
9. Fahmy T: XLSTAT (version4.4). Paris, 2000

10. Ballay S, Sieffermann JM, Gazano G: Sensory evaluation of cosmetic essences using two different profiling techniques: The 5th Pangborn Sensory Science Symposium, July 20-24, Boston, 2003
11. Ballay S, Sieffermann J-M and Gazano G: Flash profile with consumers : A new method to understand specific Japanese moisturizing expectations on cosmetic products. IFSCC 23rd Congress, October 24-27, Orlando, 2004