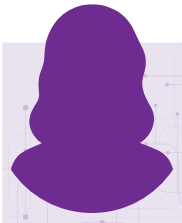
#Method

The Importance of Sensory Analysis in Cosmetics

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Sensory analysis is widely used in the field of cosmetics to describe a product based on characteristics other than physicochemical ones, with the aim of developing or improving the product. This article presents various sensory analysis methods and their principles as applied to cosmetics.

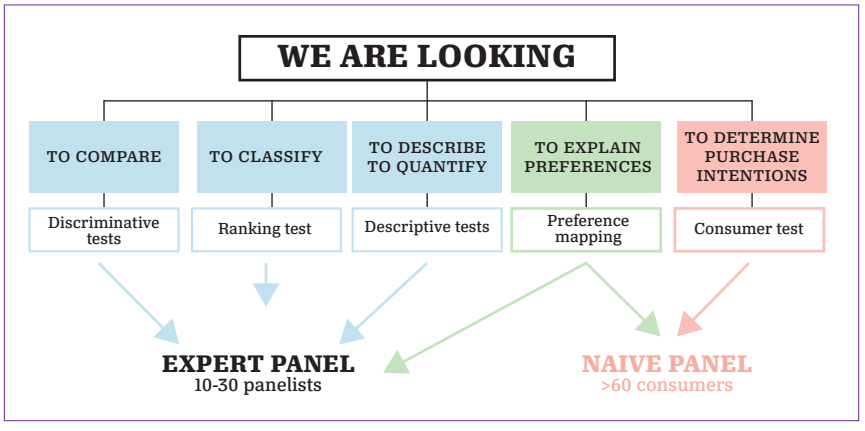
Also called sensory evaluation or organoleptic testing, sensory analysis is defined by the NF ISO 5492 standard as *"the examination of the organoleptic properties of a product by the sense organs."*

The sensory analysis of a cosmetic product thus involves sight, smell, touch, and, more rarely, hearing. It is a measurement method carried out by a group of people, referred to as a panel, who may have varying levels of expertise. Depending on the objective of the analysis—whether to check a product's quality, improve it, or understand consumer preferences—the method and panel selected will vary, as shown in Figure 1.

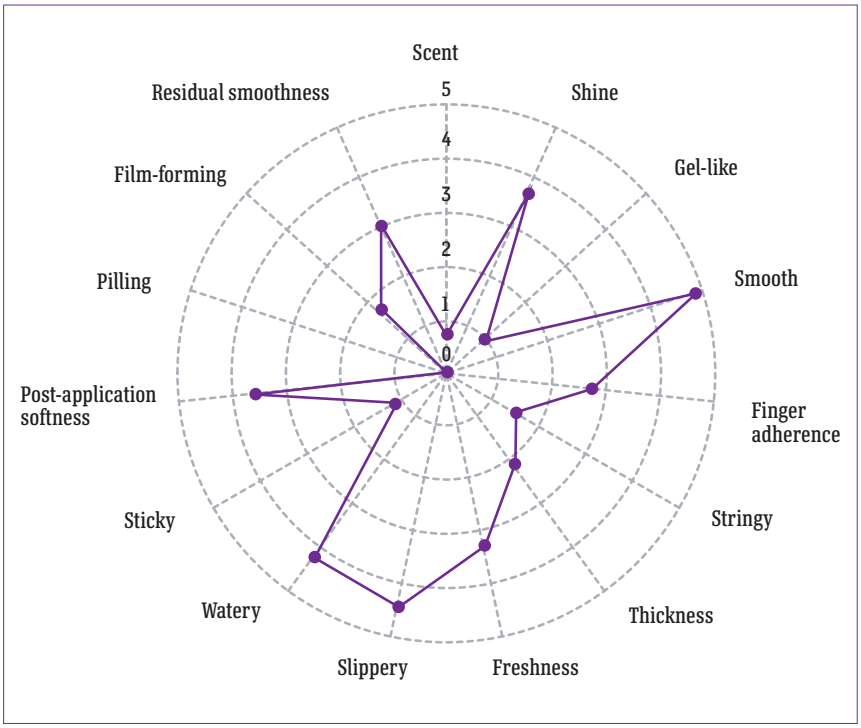
Hedonic tests reflect consumer preferences. During an acceptability test, a naive, untrained panel evaluates the product using a scale based on its pleasantness or unpleasantness, tolerance, and perceived effectiveness. Consumers may also be asked to directly identify their preferred product through a preference test[2]. These methods allow for testing or comparing formulas in order to understand consumer expectations and their acceptance of the product.

If the goal is to compare several products or formulas in order to detect differences, a discriminative test is appropriate. It requires a panel of experts with significant training to be reliable. A good example is the triangle test, which pits two products against each other: one is presented twice, and the other once, in a random order. The panelist then indicates which sample seems different if any difference exists. This test is commonly used to confirm to the consumer the development of a "new formula". Another example is the paired comparison test, where the panelist identifies differences between two samples to determine if a change in production affects the sensory properties of a product. To compare products, a ranking test based on a single sensory characteristic can also be performed[3].

As for descriptive tests, they allow for detailing the sensory characteristics of a product. The most common is the descriptive profile, established by an expert panel that lists the sensory descriptors associated with the product. These descriptors may include terms like shiny, fresh, greasy, sticky, etc. These descriptors, of course, vary depending on the type of product: a cream is not described in the same way



▲ **Figure 1:** Choice of sensory tests based on the company's objective[1].



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▲ **Figure 2:** Sensory profile of an inverse emulsion polymer in a gel cream [4].

Appearance	Liquid	Foamy	Smooth	Thick
Color	Shiny	Transparent	Matte	Opaque
Smell	Citrus	Floral	Fruity	Pungent
Texture	Brittle	Stringy	Firm	Gel-Like
Spreadability	Slow	Easy	Slippery	Resistant
Finish	Soft	Greasy	Rough	Fresh

▲ **Figure 3:** Examples of sensory descriptors for a skin care product.

as a perfume or a gel. An example of a descriptive profile is shown in Figure 2. These tests must adhere to standards, have an appropriate environment to avoid biases, and follow a well-defined protocol, such as applying the sample between the thumb and index finger on the back of the hand when it is a skin care product. Specific instructions are given to panelists, such as the order in which to describe the products[5]. The descriptors used must also meet certain requirements: they must be exhaustive and independent, as well as relevant, precise, and discriminative. These terms are thus used in everyday language to be understandable and communicable, but with specific vocabulary to ensure coherence and meaning[5]. Figure 3 provides some examples of terms used.

Following a test, more or less sophisticated statistical analyses are performed using graphs, starting with each descriptor individually. Calculations such as the mean, median, standard deviation, and range are carried out, taking into account the diversity of the panelists to ensure representative results.

While most of the time, these analyses are conducted in a specific sensory laboratory, more and more cosmetic brands are turning to custom beauty and pop-up stores to get closer to consumers. Indeed, this allows to obtain the results of hedonic tests immediately after they are conducted, providing a way to create a personalized product tailored to the needs and preferences of the customer. Pop-up stores thus become ideal temporary locations for conducting these sensory tests due to their appealing accessibility. New formulas can be directly presented to consumers, who will naturally judge and determine their preferences. The advantage of pop-up stores is therefore twofold: customers test products in a fun way, and their feedback is collected in real time.

Conclusion

Sensory analysis is used to evaluate the organoleptic characteristics of a product in order to improve its quality. It enhances consumer satisfaction by detecting and reducing sensory flaws, such as an undesirable odor, thus minimizing the risk of product failure when it is launched on the market. This evaluation is therefore essential for making business decisions and standing out from the competition.●

References

1. Anne-Marie PENSE-LHERITIER, L'analyse sensorielle et l'univers cosmétique, l'actualité chimique - octobre-novembre 2008 - n° 323–324 (English translation)
2. Sens & Solutions, Révéler les secrets sensoriels : Guide Complet de l'Analyse Sensorielle, consulté le 30/07/2024
3. Félix DEPLEDT, Evaluation sensorielle : Manuel méthodologique (3e éd), Lavoisier, 2009
4. SEPPIC, Analyse sensorielle, Étudier le rôle des ingrédients dans le profil sensoriel d'une formule, consulté le 30/07/2024 (English translation)
5. Soumaya EL BOUCHIKHI, Formulation galénique et sensorielle d'un aliment fonctionnel à l'huile d'argan, 2022