

Using the Brain (Not the Nose) to Smell

A systematic approach to the most fundamental of techniques for perfumers and flavorists

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Over the past 10 years I have had the pleasure of instructing more than 6,000 students via online courses and in-person workshops and private courses. Their ages have ranged from eight to 80, from complete beginners to some of the most experienced professionals in our industry. One of the first questions I ask in the workshops is, “Have you ever had lessons in how to smell?” I usually raise my hand in the hope of encouraging a positive response. Usually receiving none, I will dig further and add something like, “Maybe your mother sat with you and went through smells with you.” Still, without fail, I will receive no response. It seems incredible that the most important and fundamental of techniques to the perfumer’s and flavorist’s skill—smelling—is hardly, if ever, systematically taught, even for those in the industry.

Smelling, then, is largely left to practice and chance; I have to be honest and admit that I too was not taught directly, but instead picked up techniques as a byproduct of working in perfumery. In the 1970s I was lucky to work in one of the last small creative perfumery houses in the United Kingdom, Picot Laboratories. As a young laboratory assistant I would sit in on the morning perfumery smelling sessions and pick up techniques through observation. But another 25 years would pass before I would stop and



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actually think about how I smelled and write down these techniques for others. This process of stopping and thinking about the way we do something is enlightening and proves to make the techniques one may already unconsciously know and use far more effective and powerful.

How We Smell

Smells, or the molecules that carry them, drift on the air and are inhaled through the nose. The molecules enter deep within

the nasal cavity and there fall upon the olfactory bulb. The olfactory bulb, an outgrowth of the brain, holds the olfactory nerve with some 10 million receptor sites that receive the odorous molecules and generate a signal to the thalamus, a complex relay station, and then onto the limbic system—the area of the brain responsible for the emotions, feelings of pleasure, fear, aggression, and (in part) the formation of memory—and the hypothalamus, the area responsible for controlling blood pressure, heart rate, hunger, thirst, body temperature and sexual arousal. The signals are relayed to the cerebral cortex where the conscious mind processes the information and attempts to perceive the odor as a recognizable smell.

Smelling Experiment: Standing vs. Sitting

I suggest the following experiment:

- Dip a sample of an eau de toilette, allowing it to fully absorb into the smelling strip so there is no lingering wetness.
- Sitting down, smell the sample gently, not too intensely—just enough to enjoy it.
- Now, standing up, smell the blotter again in the same way.

Was there a difference in the odors? Did it appear to be it stronger sitting down or standing up? If you found a difference, why do think there was?

Smelling Strip Test

- Get as many different smelling strips as possible—both from different companies and homemade versions from other paper types. For the latter, one can use chromatography paper, blotting paper, business card paper, absorbent felt, linen paper, etc.
- Choose an eau de toilette and dip each smelling strip with the same amount, then note the odor differences on each.
- Choose the material that gives the best odor release for the smelling strips.

As a metaphor, this test can reveal contrasts as striking as listening to Stravinsky’s “The Rite of Spring” both through a telephone earpiece and in front of a live symphony orchestra.



The worst place to smell a fragrance compound analytically? The fragrance lab.

So is the nose where we smell? It is certainly the detector, but it is the brain that does the work in processing and recognizing odors. The significance of this is that the olfactory bulb has a limited capacity in terms of receptor sites and tends to become fatigued; that is, once all the receptor sites are full, no more information can be sent until the odorous molecules there have been released and make way for fresh ones. If one wants to gather the maximum information possible from a smelling session, one should consider these factors.

The easily implemented techniques listed in this article, some of which may appear controversial, pivot on the concept of using the brain/mind system to smell analytically, rather than idly sniff, which is one's natural tendency.

Factors Affecting Smelling Quality

There are essentially four areas that must be addressed in order to improve the efficacy of a smelling session: environment, personal preparation, sample preparation and smelling techniques.

Environment: There is a lot that individuals and small companies can do to optimize the smelling experience. Those working in an international perfumery company may be lucky enough to have specialized sterile smelling booths with well-ventilated, deodorized, filtered, humidity and temperature-controlled atmospheres. If not, or one is in a situation that requires smelling outside of a booth, this section is key.

Eyes Closed Experiment

- Dip a sample of an eau de toilette, allowing it to fully absorb into the smelling strip so that there is no lingering wetness.
- Sitting down, eyes open, smell the sample gently—not too intensely; just enough to enjoy it.
- Now, still sitting down, smell the sample again with eyes closed.

Was there a difference in the odors? Did it appear to be stronger smelling with eyes open or closed? If a difference was detected—ask yourself why.

Most in the F&F industry will at one time or another find themselves in environments that do not represent the ideals of the smelling booth. The objective is to learn from the conditions in a booth so that one can either approximate them or compensate for them in some way. The purpose of a smelling session is quite different from a casual stroll through the couturier section of a department store or the duty free for a quick sniff of Chanel's latest. The smelling session is a method of smelling to glean as much information from the smelling experience as possible. Ideally, one will choose a location that is clean and relatively free of odors. It is also advisable that the area

be quiet and conducive to a relaxed state of concentration with no unnecessary audible or visual distractions.

Rooms higher in a building generally have fresher and cleaner air than those on the ground floor; some natural daylight will allow UV wavelengths to help deodorize the air. Smelling spaces should be free of distractions such as busy décor or windows facing onto a busy corridor. Air temperature and humidity should be kept at a slightly cool and dry level—enough to maintain concentration without being distracting. One may also consider installing an air filter with an activated charcoal cartridge in the space; this will help to remove unwanted smells from the room.

To stress this point, please take a moment to consider this question: “Where is the worst place to smell a perfume compound sample?” Places that likely come to mind include kitchens, bathrooms, coffee shops and smoking rooms. Few people would cite the truly worst place, the place where most professional perfumers actually do their initial smelling evaluation of samples—the *odorothèque*, the perfumery laboratory. There may be hundreds of bottles of perfume materials lining the shelves in these spaces, all of them emanating tiny amounts of odorous molecules. Trying to smell analytically in such an atmosphere would be like trying to listen to Eric Satie's

Odor Fatigue Experiment

- Dip an eau de toilette, allowing it to fully absorb into the smelling strip so there is no lingering wetness
- Write on the smelling strip, “30 minute sample.”
- Keep it about 30 minutes. Then dip the same eau de toilette and write on this second smelling strip, “Newly dipped sample.”
- Sitting down, smell the “30 minute sample” gently, but deeply, until the smell fades (this may take about 20 times).
- Now, quickly (within 5 seconds) sniff the sample marked “Newly dipped sample.”

What did you notice? Was there a difference in the odors? If so, describe the difference. If there was a difference, think about why.

“Gymnopedes” piano piece on a noisy playground. Yes, it’s possible to do so, but not truly conducive to getting the most from the music.

Personal Preparation

Having chosen an ideal hideaway for smelling, participants should then focus on themselves. Hopefully they will not be wearing highly fragranced products; trying to critically smell a pretty little muguet cologne while seated across the table from someone wearing Thierry Mugler’s *Angel* is not helpful. In addition, long hair is best tied back and should not be allowed come into contact with smelling strips as that can introduce a source of contamination.

Personal hygiene also factors in, of course; a session can be destroyed if one of the members has just returned from a training session for next month’s marathon without having taken the time for a shower (or had a shower and splashed on Paco Rabanne’s *Pour Homme*). In addition, lingering smells from lunch (garlic bread, basil and espresso) don’t add to the smelling experience. Recently, I was carrying out a smelling acuity test for 10 new members of a quality control team led by a woman with terrible breath. The nature of a smelling acuity test requires participants to smell many samples of differing concentrations; some are deliberately diluted as to verge on undetectable. This test is intended to find the real “smellers” in the group and so is quite demanding. On this particular day, because of the omnipresent bad breath, even I could not have passed the smelling test.

During smelling sessions it is good to be relaxed and alert. Sitting down allows the blood pressure to drop and release more of the body’s resources for the session. It should be noted, however, that many companies want to avoid the smelling experience becoming a “time out” event and frequently design out the opportunity to sit during smelling (see **Smelling Experiment: Standing vs. Sitting**).

Finally, it is important that participants prepare a notebook and pen for note-taking during the smelling session.

Sample Preparation

As one doesn’t want to contaminate the room chosen for a smelling session, preparation of smelling strips is best carried out in a separate room or area away from the smelling space. Smelling strips made carefully from neutral paper stock free from traces of chemical or bleaching agents give the best results. My own favorite is chosen from chromatography paper and is useful because of its availability to those requiring only moderate quantities. The subject of paper thickness, strip length and width, fiber characteristics and non-paper alternatives are subjects for a separate article. But in essence, the strip should be long enough and stiff enough to remove the hand from smelling range of the nose during evaluation. A thinner strip giving maximum spread of the sample is better for analytical smelling; a slightly thicker strip is generally preferable for presentation of samples to customers as it gives a more homogenous odor. When comparing one or more

samples it is important that the smelling strips are from the same source and stock, as different papers give differing evaporation characteristics (see **Smelling Strip Test**).

Smelling samples are usually best arranged from weakest to strongest in order to maximize the number of samples that can be evaluated before odor fatigue sets in. The amount dipped should be the same each time, especially when one is comparing two samples against each other. The amount dipped is also best kept to a minimum; inexperienced students frequently over-dip a sample, plunging the smelling strip into the liquid. Generally, dipping a sample to 0.5 cm or one-half inch along the strip is sufficient. The sample should be allowed to spread on the strip until the wetness has gone. Dropping the material onto a smelling strip gives good results, but may be awkward if a lot of samples are smelled on a regular basis, as many clean pipettes or droppers have to be managed in addition to the smelling strips.

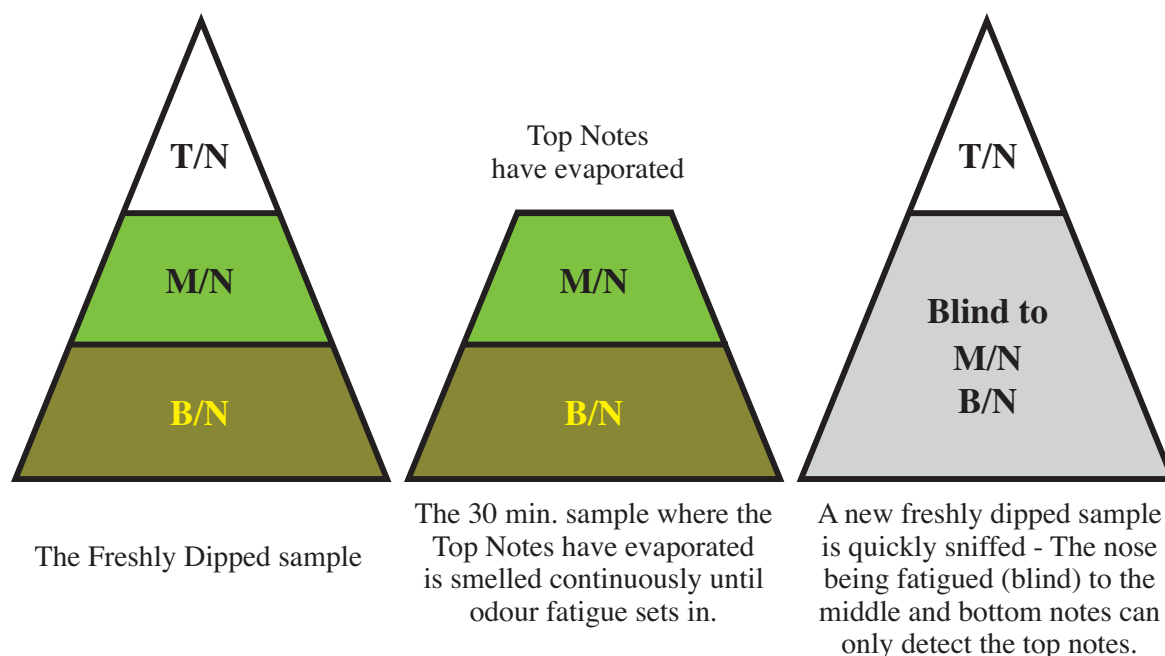
A useful tip is to bend the smelling strip about 3 cm from the dipped end to about a 30-degree angle with the dipped end slanting away from the nose during smelling. This helps in hand-eye coordination and controlling the strip when smelling to prevent touching the nose with the sample. The bent smelling strip is also useful if one is not using smelling strip holders and placing strips on the work surface, a common but undesirable practice. A little caution is necessary here to avoid contamination of the samples’ odor with smell-ridden hands.

Having dipped the samples, it is best to wait a few seconds for the material to be absorbed, as mentioned. This allows full spreading of the material and fuller release of all the components of the sample into the headspace. Smelling a still wet smelling strip will give an effect similar to smelling the liquid material from the open bottle.

Smelling Techniques

The main difference between an amateur and a professional smelling evaluator is that the amateur uses the nose to smell, while the professional uses the brain. During smelling, if one regards the nose as the detector and the brain as the integrator and processor of the information derived from each sniff, great effects can be achieved. The nose/olfactory bulb has a high, but limited, number of receptor sites and therefore is subject to overloading, as can be demonstrated by odor fatigue (discussed below). There are no odor receptor sites in the throat or lungs, so one should try not to inhale any deeper than necessary, producing a sniff that draws air through the nose and straight out the mouth in an almost rhythmic circular flow.

Instead of holding a smelling strip under the nose and continuously sniffing, it is more effective in the long term to sniff, evaluate, sniff, evaluate and so on. This is similar to wine drinking, in which the very first sip gives the clearest flavor, but subsequent sips blur the individual flavors into each other, some of which may fade into oblivion. Thus, with each sniff, the nose is used to detect the odor and then the strip is removed from the vicinity of the nose for a period of evaluation using the memory of the smell for the analysis.



A few rules of thumb:

- Smell short and sweet:** One should hold the smelling strip with the upbent part perpendicular to the nose so that the dipped section is 1–2.5 cm (1/2–1 inch) from the nostrils. The first light sniff is then taken and the smelling strip removed from the vicinity of the nose as the data collected by the olfactory system is mentally evaluated. Subsequent sniffs are carried out in a likewise manner, short small sniffing procedures followed by longer evaluations. This technique minimizes fatigue, allowing the olfactory receptors to recover between each sniff. Also, as each named ingredient (note) found in a perfume sample clears at different rates from the receptors, some separation of individual notes can be detected. Another beneficial effect of this process is that it increases the evaluator's ability to hold the odor in his or her memory for longer and longer periods, thus stretching and enhancing odor memory capability.
- Build a network of connections:** It is recommended that evaluators make prolific notes of any of the connections, impressions and feelings that they experience during smelling and listen to others' ideas. These should then be transferred onto cards or searchable computer records so that they can be cross-referenced by the odor characteristics of other records. The evaluator must believe in his or her own senses; I strongly discourage students asking if their impressions or comments are correct.
- What is it not:** Frequently, especially for new evaluators, it can be quite difficult to overcome the initial mental block in smelling—that period of orientation when the smell has been detected but not yet recognized. When this happens, it can help if the evaluator systematically goes through a complete list of classifications of smells and identifies whether the detected characteristics are present or not.¹ This, by a method of elimination, means the negative results become as revealing as the positive results. Does it have aliphatic notes—yes/no? Does it have fruity notes—yes/no? And so on. Thus, as Sherlock Holmes said in Arthur Conan Doyle's "The Sign of the Four," "When you have eliminated the impossible, whatever remains, however improbable, must be the truth."
- Eyes closed:** The simple act of closing one's eyes helps filter out outside distractions and can focus the mind on the act of smelling (see **Eyes Closed Experiment**).
- Smell through the mouth:** Holding the tip of the smelling strip about 2 cm below the nose and about 1 cm away from the mouth and gently breathing in through parted lips enables one to experience the odor slightly differently—retronasally. The vapor passes over the tongue into the throat and up the back of the nasal passage to the olfactory receptors. The effect is that one adds the taste sensations to the appreciation of the scent. In addition, the longer route over wet mucous membranes alters a fragrance or flavor profile sufficiently to

impart a different perspective of the odor. This can be a powerful method for evaluating essential oils to determine their naturalness; some essential oil reproductions, although good on smelling, may fail miserably on this test. Older perfumers may actually taste oils, but this is generally not to be recommended for safety reasons.

- **Warm the sample:** An average of one to two students in each class will adopt a smelling technique of waving a smelling strip—sometimes quite violently—in front of their noses. Their explanation is that it seems to increase the strength of the odor of the sample. Other than the fact that it looks rather frenetic, there is nothing inherently wrong with this—if they manage not to make contaminating contact with the end of their nose. However, with a little practice they can usually be discouraged from this by using the following technique: In the event that the odor impression of a sample is not sufficiently distinctive, the strip can be held in the smelling position and gently exhaled upon through the nostrils to warm it. Once or twice is usually enough to increase the odor emanation from the strip. From this point, the evaluator can sniff and evaluate the sample in the normal manner.

- **Inducing temporary selective odor fatigue:** This is a fairly advanced technique, familiar to most perfumers, for analytically comparing the differences between two similar samples. This method involves repeatedly smelling (thus inducing) a first sample (the selective notes) until it can no longer be smelled (odor fatigue). The effect only lasts for a few seconds, so the second sample has to be quickly evaluated. The olfactory receptors at that crucial point, being temporarily “blind” to the materials in the first sample, can only detect materials in the second sample that are not in the first. When the difference between the two samples is only one or two materials, the effect is dramatic, making identification of individual notes much easier (see **Odor Fatigue Experiment** and **F-1**).

Applications of Inducing Temporary Selective Odor Fatigue*


- i) The nose, having been deadened to the components in an alcoholic perfume dipped 30 minutes previously, can smell only the top notes that have evaporated in the first 30 minutes in a second freshly dipped sample.
- ii) When a match is close to the original, either sample may be used to induce odor fatigue and the second sample smelled to highlight the differences. This is particularly useful for identifying natural oils after recomposition of a perfume sample from GC/MS data.

- iii) This technique is useful for any two samples that have small differences, such as smelling a pure sample against a contaminated sample. The nose is fatigued to the pure sample, so when the contaminated sample is smelled, only the cause of the contamination is left. This effect only lasts for a few short seconds and so must be completed quickly; familiarity with the short and sweet technique above prepares one to make the most of the fleeting data received.

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References

1. S Dowthwaite, The ABCs of Perfumery. *Perfum Flavor*, May/June (1999)

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*A word of warning:

This method should only be used very sparingly as it is very tiring and long term sensory and health effects are un-researched.

My own recommendation is that this technique should only be carried out towards the end of the day so that the respiratory system may be completely flushed out afterwards with fresh air away from the perfumery environment.