

The Multi-sensory Approach to Fragrance Creation

Modern research techniques unveil the power of fragrance in communicating with consumers

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Modern brands are tuning into the senses, realizing that the correct sensory combination results in an emotional connection with consumers that is a powerful driver of success in the marketplace. People navigate their lives and make choices by using the five senses. Primal and instinctive, they are more powerful in shaping one's perception of the world than any smart technology. For the perfumer, understanding the complex relationship between the senses brings a new facet to the craft as fragrance moves from art to science. Each sense brings a wealth of information about an experience—be it product, place or person.

The Senses

Sight: Sight is the primary human sense; far more of the brain's sensory capacity is devoted to ocular stimuli than to any of the other four senses. Due to this, the other senses can be deceived by sight. For example, the perception of the flavor of a food or drink can be altered by what it looks like. In a 1980 study, Du Bose et al. demonstrated that while most people perceived a cherry-flavored drink to taste of cherry when it was colored cherry red, many thought it tasted of lime when it was colored green, and nearly 20% thought it tasted of orange when colored orange.¹ The pleasure derived from consuming food and drink can also be enhanced if it looks right, i.e. if it fits into a preconceived construction of how we think it should look. For example, people prefer the smell of fresh fruit more strongly if the product is an appropriate color.²⁻⁴

Hearing: This sense also proves vital, as it is one of the most important senses for social contact and interaction.⁵ In today's hectic society, people are busy processing audio signals from multiple sources, often simultaneously. Along with vision, hearing is the primary sense for gauging distance and provides an excellent early warning system, alerting the body to what it can't see. However, hearing can also be deceived by sight. An excellent example of this occurs at the cinema. The sounds of people speaking in the film are perceived as coming from the lips of the people on the screen, but in fact the sound comes from the speakers in the theater.

Touch: As one of the first of the senses to develop, touch provides our most fundamental means of contact with the world.^{6,7} Touch enables people to share their feelings with others; in fact, a child's first lesson in loving comes from the cuddling he/she receives.

Both hearing and vision can dramatically alter a person's emotions. This is illustrated by the "parchment skin illusion." Jousmäki and Hari reported that they could make people feel as if their hands were smoother and drier, or rougher and moister simply by manipulating the sounds that the participants heard when they rubbed their hands together (by either boosting or cutting all high frequency sounds above 2 kHz).⁸ This highlights one of the most interesting aspects of sensory interactions. While intuitively it might be expected that the only way to change how something feels is by changing its tactile qualities, contemporary research now supports the view that often the most effective way to change how things are experienced in one sensory modality is by altering how another "unattended" modality is perceived.

Smell: Smell is the sense most closely linked to the emotional centers of the brain. Although more of the brain is dedicated to vision than to any of the other senses, more genes are devoted to the sense of smell (1%) than to the detection of all of the other kinds of sensory information. People possess an excellent ability to detect and discriminate odors but most have great difficulty in describing them verbally. Despite this fact, odors have an extraordinary ability to trigger memories of past events, sometimes from many years ago. The latest two-stage study, directed by myself and John Behan, also of Givaudan, discloses that some reactions to scent are learned and depend upon the cultural traditions of one's society, while others are "hardwired" into the human brain and are therefore consistent across disparate populations.

Like other senses, the sense of smell also can be deceived. During a television program about the senses, O'Mahony told the audience that when they heard a tone they would experience a pleasant country smell.⁹ Many viewers wrote in to report that they had perceived the smell of grass or hay. Several people even wrote to complain that they had suffered from attacks of hay fever and sneezing after listening to the tone. The belief that an

odor was present was sufficient to trigger these sensations in many people even though the odor was not actually there.

Further evidence shows that smell has a defining influence over the more emotional and associative drivers of choices because it has a hotline to moods through the biological link between nose and brain. To understand how it works requires the unraveling of the subtle links between fragrance and feelings.

The Power of Smell

There have been several interesting experiments that illustrate the power of the sense of smell to influence decisions. In 1932, Laird interviewed 250 housewives about their preferences for a selection of silk stockings.¹⁰ All of the stockings were identical, but 50% of the women preferred the stockings that had a slight narcissus scent over other pairs of stockings that had either a natural or fruity scent. The women did not attribute their preferences to the smell but to the durability, sheen or weave.

In another study Power did a market test of shampoos.¹¹ He reported that the rating of one particular shampoo went from bottom- to top-ranked out of a range of different products simply by improving its fragrance. As in the case of the stockings, people reported that the shampoo (with the improved fragrance) rinsed better, lathered better and even gave more luster and shine.

It is surprising that sensory dominance can have such a profound effect on perceptions. Much of what people perceive in the world is determined by the consequences of sensory dominance. Knowledge of the mechanisms of sensory dominance and sensory integration is growing rapidly and offers some exciting possibilities for the future. Developing holistic sensory (involving all of the senses) products for the future will heighten the total sensory effect and increase the pleasure derived from using a product.

Multi-sensory Approach

Givaudan's approach has been to find ways to capture and understand the labyrinthine links people make between fragrance and emotion. The sensory program at Givaudan is made up of a portfolio of tools that ranges from traditional market research to academic research. *Miriad*, mood odor mapping and mood portraits, are key components of this sensory program.

Miriad: *Miriad* explores and measures the emotional content of fragrances through the collection of consumer responses to fragrance, expressed in the consumers' own language. The results have been revealing; for example, the research distinguishes different types of "happy" smells. In addition, there are many types of "invigorating," "relaxing" and "sexy" smells that change over time. Research in the United Kingdom, the United States and

France shows the odor types that people associate with happiness. For the British it is fruit—red berries, tropical or orchard fruit. People in the United States agree, but in the more fragrance-aware France, sweet, powdery, floral and musky woody smells also were associated with well-being and happiness.

Miriad is a global listening post that allows Givaudan to delve into the richness of the emotional language people use when triggered by smell. It also gives insights into how people relate smell to the other senses. For instance, the research reveals what people in France think Mediterranean red smells like. Or, from another perspective, *Miriad* can be used to find out what color an existing perfume is in people's imaginations. Not only does this give Givaudan perfumers a reservoir of inspiration, but it also can inform product design in terms of texture, packaging and the language used to promote it.

Mood odor mapping: Creating fragrance to evoke a particular mood is not straightforward. Moods are neither one-dimensional nor static. In fact, a range of different emotions form what is commonly understood to be a mood. What makes up one person's idea of relaxation might well comprise surprisingly energetic references, whilst another will enlist only lethargic terms. Mood odor mapping takes this knowledge and statistics to create maps for odor-derived or -inspired moods. These enable the plotting of fragrances around a wide range of reference points, each being a verbally generated description of moods evoked by odors based purely on consumer response. For example, two potential fragrances for a luxury bath oil are presented to consumers who are then asked to describe how the oils make them feel and to plot these feelings on a mood map. The results reveal that one fragrance is perceived as having a predominantly floral rose smell, while the other is more floral jasmine. Taking these results and overlaying the mood research shows that rose evokes happy feelings and jasmine is more comforting. So, although the fragrances appear to be similar (both

luxurious, both floral) they will contribute very differently to the success of a product that is designed to pamper.

This kind of odor mapping allows for the exploration of differences between cultures and geographies. It is known that musky, sweet powdery and dessert scents (such as vanilla) are the odors that the British find relaxing. In France and the United States, friendly fruity smells have the same relaxing effect.

Mood portrait: A mood portrait provides a way of finding deeper links between fragrance and emotion by eliciting more spontaneous responses. This is done by bypassing the need for words and using images instead, which provides a more comprehensive and flexible picture of how a smell evokes a mood, and what that mood looks like. While people struggle to describe smells using a limited vocabulary, they are much more comfortable with visual descriptors. In addition, this profiling technique enables spontaneity while also being measurable.

Olfactory Process

But what about taking things a step further? Bypassing verbal or visual descriptions and getting straight to the heart of the matter? The process by which olfactory messages are interpreted is not yet fully understood, but it is known that they transmit from the olfactory bulb along the olfactory nerve directly to the brain, where the path of the message divides into two. One route passes into the olfactory cortex at the front of the brain where identification and differentiation between odors occurs; the other passes into the limbic system at the center of the brain. The limbic system is believed to be the emotional center of the brain and it is here that many sensory messages are received and interpreted.

It is believed that this close link between the olfactory sense and the limbic region is the reason for such a close association between smell and emotion. To try to understand this link, researchers have studied the workings of the brain itself. Until recently, little data was available that

characterized the nature of odor processing in the brain centers higher than the olfactory bulb. The problem lay in the complexity of the higher brain structures, the lack of understanding of brain mechanisms and the difficulty of detecting and locating brain activity. There is now a variety of imaging techniques that have been developed to investigate the structure and functionality of the brain.

Imaging Methods

Brain imaging methods were primarily developed for two purposes: to visualize structural information about the brain, and to measure its functioning. The methods have developed to facilitate clinical knowledge, diagnosis and treatment, and each has its limitations when applied to functional research studies such as olfaction. The chief methods used for visualizing the living brain include standard radiographic methods, contrast radiography, computerized axial tomography, magnetic resonance imaging, positron emission tomography and electroencephalography (EEG).

Givaudan uses spontaneous EEG, which is a way of measuring the delta, theta, alpha, and beta waves to calculate electrical activity of the brain from the surface of the scalp. It enables examination of the direct connection between an odor, the brain and the physical and emotional effects.

Results have shown significant differences in the quantitative and topographic changes in brain activity recorded from the scalp following presentation of a range of odor types. For the first time it is known whether, when a fragrance described as “relaxing,” hits the brain, it actually does relax the body and trigger the appropriate sense of well-being.

Previously, the industry’s understanding of the benefits of fragrance was based upon the traditions of aromatherapy. Now the effect can actually be seen; fragrance is a means for manufacturers to communicate with consumers and for consumers to manage how they feel through the products they buy. It was ever thus, but research now explains and defines the reasons why. As the programs continue and those “hardwired” reactions are collated, perfumery for global brands is set to become an exact science.

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