

Scent In Space and Product

Breast Milk or Warm Vanilla Sugar

Kaila Rodriguez

“Smell is more than just an environmental cue...”

It plays a fundamental role in grounding emotional moments in our lives, often serving as a powerful link between past experiences and present sensations. Unlike other sensory inputs, scents have a direct and immediate pathway to the brain’s limbic system, the region responsible for emotions, behavior, and long-term memory. This unique connection helps explain why certain smells can instantly evoke vivid, emotionally charged memories. I find that many of my earliest memories, reaching as far back as fourth grade, are intricately tied to particular scents.

One of my favorite scents is pine, a nostalgic reminder of the towering pine trees behind my elementary school, near the third and fourth grade classrooms. The smell instantly takes me back to that and a childhood crush with curly dark hair and a skinny frame, whose crooked teeth I can still picture vividly. We would joke to others that we were cousins, a playful cover for sneaking behind those trees after school while our dads avoided the long line of waiting parents. Now, not that many years later, he’s the father of a one-year-old boy.

This realization sparked my curiosity about how individuals develop personal associations with certain smells and how these connections evolve over time. By understanding these connections, I aim to investigate how smell can be harnessed to enhance design in ways that immerse the user in various environments. When one considers the senses of sight, touch, taste, and hearing, the sensory input must first pass through various neural pathways before reaching the brain areas responsible for interpreting what has been seen, felt, tasted, or heard.

In contrast, when an individual encounters a scent,



odor molecules enter the nose and travel upwards to a specific region where the brain is directly exposed to the external environment—a unique feature exclusive to the sense of smell, connecting directly with the limbic system, where the only subsequent processing involves linking the sensory information to two key functions: emotion and memory.

Where Scent Meets Feeling

The limbic system is a complex network of brain structures that plays a key role in regulating emotions, memory, and certain aspects of behavior. It acts as a bridge between higher cognitive functions and the more primal, instinctual parts of the brain. The major components of the limbic system include the hypothalamus, hippocampus, amygdala and thalamus. Each contributes uniquely to the way humans experience emotions

Image One (top) Green tree car air freshener with “Memories” as the scent name.

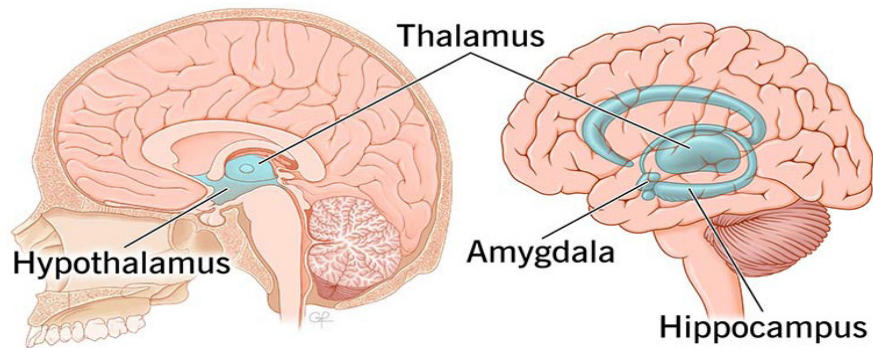
and memories, particularly in response to sensory stimuli like smell.

The hypothalamus releases hormones that trigger the release of other hormones to maintain homeostasis in the body. The hippocampus helps the forming and recollection of memories. This part is important especially for spatial orientation, allowing people to recall the location of places and objects. Then there is the amygdala which processes the emotions that cause fight or flight responses; also playing a role in memory storage. Lastly, the thalamus processes sensory information. Due to the unique structure, individuals have all the basic processing done before conscious awareness of a scent.

When individuals encounter familiar scents, this system retrieves memories and emotions connected to smells

“... this system retrieves memories and emotions connected to their past.”

Image Two (top) Inside and outside view of brain, highlighting parts of the Limbic System; hypothalamus, thalamus, amygdala, and hippocampus.



encountered in their past. This retrieval creates a sense of continuity between the past experience and the present, strengthening the emotional impact of an environment. The impact of scent on human perception and behavior is profound, with its effects transcending conscious thought to evoke powerful emotional responses. Understanding the science behind scent's influence offers valuable insight into how environments can be shaped to resonate emotionally with individuals. One notable example of a scent with a powerful, universal impact is vanilla. This is because vanilla is the chemical sister of vanillin, which is found in breast milk, as well as formula, that newborns are exposed to and create a positive association with for the most part.

From before birth through the first ten years of life, every scent a person encounters is accompanied by an emotional response. During this period, new sensory experiences are continuously formed and become closely intertwined with emotions, creating lasting associations. These scent-emotion links are stored in the most vivid and detailed parts of memory. As a result, when an individual encounters

a familiar smell later in life, they are instantly transported back to the original moment they first experienced it, along with the emotions they felt at that time. If an individual does not encounter a smell during those years, they reject it as an adult according to the National Library of Medicine in an article about the effects of aging on smell and taste.

Smell as Material

According to Dawn Goldworm, who is a smell expert and the Nose behind successful fragrances for Lady Gaga, Nike, American Express, etc, smell is conditioned and cultural, changing in different places globally. For example, only in Europe, certain parts of the United States and some South American countries, do individuals find lavender relaxing. That is because there are traces of lavender in baby products in those places. “In the South of France, they use

“In the South of France, they use orange blossom in baby products...”

orange blossom [in baby products]” said Goldworm in an interview.

Think about opening a new box of sneakers, what do you smell? Leather? No. It is a combination of vital molecules that break down when the sneaker is created, boxed and shipped. Vital molecules disperse, they don’t stay inside a product, so the leather, rubber, plastic and adhesive molecules sit in a cardboard box while it gets moved, shipped, heated and cooled, creating the off gas smell when the box gets opened. Leather is a designed scent. Scented to smell like “leather,”

otherwise it will smell like a dead animal. The scent of leather was created because the smell of a dead animal on top of another animal was not appealing. This is how commercial perfume was brought to Florence by Catherine de Medici, the queen of France in 1533. Because scent is cultural and

“Leather is a designed scent... otherwise it will smell like a dead animal”



Image Three (center) A pair of white Nike Air Force 1s on a model. One is cut in half vertically to show the cross section of different materials.

generational, the scent of leather has changed. This is an example of a scent that has not changed too drastically; it is afterall leather.

Nike’s signature scent, developed by Dawn Goldworm, is designed to capture the essence of “the smell of sport.”

The composition of the scent includes several distinct elements that collectively recreate the atmosphere of a sporting event. Metal, leather and sweat accords to mimic the smell of worn soccer cleats, capturing the combination of the leather upper, the metallic studs, and the sweat from intense gameplay— bringing the gritty, competitive energy of the field. Molecules resembling fresh-cut grass and damp earth evoke the aroma of outdoor sports fields, transporting individuals to the sensation of stepping onto a freshly prepared pitch. Also incorporated are the off-gas scents of heated rubber and linoleum, replicating the familiar sound and smell of sneakers skidding across a basketball court. There is the unique smell of a well-worn basketball, when it gets oily from constant handling; accords of rubber, metal, and sweat, reminiscent of a gym; and the smell of a freshly opened box of new sneakers, particularly an Air Force One, with the fresh scent of rubber, glue, pristine leather, and cardboard.

When combined, these elements form a complex and layered fragrance that encapsulates the feeling of being on the verge of playing a sport. The fragrance is carefully crafted to evoke the sensory experience of athletic environments and the anticipation of physical activity, making it an olfactory extension of the brand’s identity and a sensory reminder of the Nike ethos: to inspire. The signature of this scent is where the emotion is and that is where the loyalty lies.

In the context of design, the swift and intense impact of scent makes a valuable tool for shaping experiences. Products tend to change about every ten years and due to the invention of plastic, toys are no longer made out of wood. People born before the mid-20th century associate childhood with smells of varnish, sawdust, leather, and natural fibers and those after do not as much. Plastics brought new and distinct chemical odors, often sweet or sharp.

Moxy Hotels use scent as a material, crafting a signature olfactory identity that enhances the overall experience. One of my earliest memories of visiting New York City was staying at the Moxy Times Square, where I was greeted by the presence of their signature fragrance as soon as I entered the lobby. The scent, which I would describe as distinctly floral with strong rose-like notes, instantly evoked a sense of calm amidst the city's hustle and bustle. The fragrance, carefully diffused throughout the space, contributed to the overall ambiance, creating an intimate atmosphere that made the compact lobby and room feel cozy and vibrant, rather than cramped.

Designing Emotional Connections

Understanding the evolution of scent associations over time allows designers to strategically use fragrance in environments, products, and branding to evoke specific emotional responses. By tapping into the scents that shaped a generation's earliest memories, designers can craft spaces and products that feel familiar, comforting, and emotionally engaging. This approach not only enhances the overall experience but also creates a deeper, subconscious connection between the individual and the designed

“The scent... instantly evoked a sense of calm amidst the city's hustle and bustle.”



space or product, making scent an invaluable tool in the designer's arsenal. Dawn Goldworm created her own brand around this concept and has found major success developing fragrances, as well as scenting different products and spaces.



Image Four (top) The Moxy neon sign outside of Moxy Times Square in New York City, taken by myself in summer 2021.
Image Five (bottom) Inside the Moxy Times Square hotel room. One Queen bed with a loft bed above and a sink outside the bathroom sliding doors. Along the left is a line of hooks on the wall as storage.

Retail and hospitality settings are in particular pioneering “scent branding” by developing unique olfactory identities that can make a space more memorable and heighten brand loyalty. The scent of a space becomes intertwined with the brand itself, allowing customers to recall the experience long after they have left the environment. The goal is to strategically use familiar scents that align with the brand’s desired image. Consequently, this serves as an enhancement to the environment—it becomes a cornerstone of emotional engagement, fostering long-term loyalty by building on familiar, nostalgic cues that evoke comfort, trust, and affinity with the brand.

In scent branding, the selected fragrance is often tailored to reflect the brand’s core values and desired image. Moxy Hotels, a Marriott International brand, represents a playful, vibrant, and unconventional approach to hospitality design. They cater to a younger, tech-savvy demographic, blending affordability with style—emphasizing fun, spontaneity, and social interaction. The interiors reflect a laid-back yet chic vibe, with industrial materials like exposed concrete, metal, and reclaimed wood, juxtaposed with soft textiles and vibrant neon signs. Music, lighting, and scent are curated to evoke a lively and immersive atmosphere. Often using upbeat soundtracks and dynamic lighting schemes.

Moxy’s approach to scent is a key part of what makes their

spaces so remarkable, it’s woven into the very fabric of the environment, transforming a simple hotel room into a memorable sensory experience. This use of scent, which is a combination of jasmine, crystal musk, and blonde woods, makes the space feel sociable and energetic. When those notes are broken down it reflects the values of Moxy what were uncovered when crafting the smell.

The exploration of scent and memory reveals a profound, often underestimated tool in shaping experiences and building emotional connections. Unlike other senses, the direct link between smell and the brain’s limbic system allows scents to bypass traditional sensory processing, evoking vivid memories and emotions almost instantaneously. This unique pathway enables designers, marketers, and brands to tap into a deeply personal and subconscious realm of human perception, influencing how environments, products, and even identities are perceived and remembered.

Banana Boat Sunscreen

The integration of scent into design and branding strategies underscores the immense power of our sense of smell in shaping human perception and behavior. As businesses and designers increasingly recognize the value of olfactory cues, scent will continue to play a pivotal role in creating immersive environments that evoke emotion, trigger memories, and

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enhance the overall user experience, making it an essential element in the toolkit of contemporary design.

As my pine-scented memory demonstrates, the simplest smells can carry the richest stories. They anchor us in our past, connect us to the present, and set the stage for future experiences. Whether it’s the smell of a freshly opened box of sneakers or the resinous embrace of pine, the thoughtful integration of scent in design opens up a deeply personal and emotional dimension. And in doing so, it ensures that the spaces and products we create don’t just look beautiful—they become unforgettable.

So I leave you with this final thought: what fragrance memory lingers in the sunscreen you used as a child?