The Psychology of Scent

Ever wondered why one woman's signature scent is another girl's poison? The secret could lie in your past

BY HANNAH BASS

Petrichor. It doesn't sound beautiful. If I were guessing, I'd say it were the name of an oil and gas company. But, to me, it's one of the most beautiful words in the English language. Coming from the Greek *petra*, for 'stone', and *ichor*, the liquid that flowed through the veins of the Ancient Greek mythological gods, it describes the scent that perfumes the air after rain has fallen on dry soil. Just hearing the word takes me back to childhood holidays with my family in the Caribbean, playing with my sister beneath mango and banana trees after a monsoon shower had soaked the red earth.

It is as evocatively nostalgic to me as my 'comfort blanket' smell—my mother's West Indian hands, fragranced with Body Shop vitamin E cream, Ammens talcum powder, and chopped garlic—or CK One, the ubiquitous unisex perfume worn by my first great love, a scent that still breaks my heart a little every time I catch a waft of it. These scents transport me to a specific time and place, to a feeling I can't quite put into words.

This is what we call "involuntary memory," a term first coined by the writer Marcel Proust when he described eating a tea-soaked madeleine cake, the taste suddenly "revealing" to him a childhood memory of doing the same thing with his aunt. We now refer to the involuntary memory effect of taste and, more commonly, smell, as the "Proustian phenomenon". But why is scent so uniquely capable of triggering emotional memories, and why is it a sensation that's so hard to articulate?

It may be, in large part, down to the way that scent is understood by the brain, says Diana Shammaa, counselling psychologist at the German Neuroscience Center in Dubai. "When we notice an odour, the olfactory neurons in the nose release an impulse to a part of the brain called the olfactory bulb," she says. "Messages are sent to the limbic system, a part of the brain that monitors mood, behaviour and emotions. Recent studies in neurology have shown the synchronicity of mental waves with identical frequency in two regions: In the cortex entorhinal, which implies the process of olfactory information, and in the hippocampus—the region responsible for our memory."

In fact, studies have shown that, whereas all our other senses (such as vision, hearing, touch) require many synapses to reach the amygalda—the region of the brain that relates to emotions—and the hippocampus—the area involved with memory—our sense of smell has an almost

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direct connection. It also means we experience smell in a different part of our brain from the areas that allocate words to experiences, which may explain why scent is at once so evocative and yet so hard to identify or describe.

Because we *are* bad at talking about scent. While we have words that describe specific visual elements—such as "yellow," or "large"—we almost always label smells only with the name of objects associated with them. For instance, how would you describe the smell of chocolate without using the word, err, "chocolatey"?

Not only is smell inextricably linked to memory; our emotional recall of smells tends to be rooted in childhood experience. Psychological research generally agrees that autobiographical memory peaks between the ages of 15 and 30. However, when Maria Larsson, professor of psychology at the University of Stockholm, Sweden, studied adults' responses to different scents, she found that while their memories triggered by verbal and visual cues tended to come from their teens and 20s, the memories evoked by smells were overwhelmingly from childhood, peaking around the age of five. She also noted that those memories were often more vivid and emotional than those related to verbal or visual stimulus.

Other researchers have found that we start to 'learn' smells very early—even before birth. Studies conducted in the 1990s showed that smells from foods eaten by the mother filter into the amniotic fluid of the womb. This can have an impact on our 'taste' for smell even as babies: Further studies showed that infants whose mothers ate a particular food while pregnant have positive reactions to its smell.

The studies conducted on babies also show that our responses to smell are a result of conditioning. Writing in *Cerebrum*, Rachel Herz, Ph.D., a psychologist and a cognitive neuroscientist at Brown University, U.S., says that, "If they have had no prior exposure, infants and young children do not differentiate between odours that adults typically find either very unpleasant or pleasant." She points to studies that showed newborn babies responding in the same way to the smells of both foul onion and anise, and even four-year-olds having the same reaction to the smell of rancid cheese as they did to the smell of banana—indeed, they wanted to avoid all of these smells. And other studies have shown that infants can even be drawn to smells that adults turn their noses up at, such as sweat and faeces. By the age of eight, however, their responses mimic those of the adults in the environment they've been brought up in.

There are evolutionary reasons for this: According to Herz, we are "the world's most successful generalists," meaning that we have evolved to be able to survive in all different kinds of habitats by eating whatever types of food are available, unlike highly specialised animals that can only eat certain foods. This means that it's to our advantage that smells aren't hardwired into our brain as innately good or bad; rather, we spend the early years of our life approaching new smells with caution, figuring out what's good and safe for us and what we should avoid.

Smell is culturally learned, too. When the U.S. military tried to create a stink bomb that would disperse crowds in any country, they found it was impossible. No smell, no matter how foul, was universally repulsive. Similarly, the scent of sarsaparilla is often thought of as unpleasant in the U.K., because it's associated with medicine; in the U.S., it's the much-loved smell of root beer, a popular soft drink. Julien Rasquinet, a perfumer at International Flavours and Fragrances (IFF) for the Middle East—a company that has designed some of the world's most iconic perfumes for a host of fashion houses—says cultural difference comes

into play when creating a mass-market fragrance. "People will not wear the same kind of perfumes to go out or to stay at home, and will choose different perfume for summer or winter," he says. "Also, every culture has different understanding of perfumes. Each culture has a 'collective nose.' The G.C.C. differs a lot from Europe, for example, but there are also amazing bridges and mutual inspirations." Think of oud, worn day and night by both genders in the UAE. In the West, it's usually considered an intense fragrance suitable only for evenings.

Of course, there are some scents generally held to have similar effects on most sniffers, says Shammaa: "We all experience waves of tiredness during the working day and some fragrance could be helpful as a general rule—the smell of peppermint seems to stimulate concentration, and the smell of black spruce has an instant effect on the adrenal gland and boosts against tiredness." She adds that our temperament may influence our fragrance choices: "According to some studies, extroverted women tend to prefer vetiver tones that can be described as deep, sweet, woody, smoky and earthy. Introverted women often prefer oriental fragrances that are heavy in base notes of spices, balsams and vanilla. And ambivalent-tempered individuals may prefer floral, powdery scents."

The common perception of certain smells can be harnessed commercially: Researchers at Stevens Institute of Technology, City University of New York, and Temple University in the U.S. found that shoppers who were subjected to the smell of cinnamon tended to buy more than those who were smelling lavender. The study authors speculated: "People smelling warm fragrances such as cinnamon [as opposed to 'cooling' lavender] feel that the room they are in is more crowded, and feel less powerful as a result," the authors write. "This can lead them to compensate by buying items they feel are more prestigious."

Often the stimulatory effect of fragrance is connected to the fact that most smells also have a 'feel' to them, which we experience through the trigeminal nerve. That's why menthol has a cooling effect, while ammonia burns. However, Rasquinet believes that even the universality of some scents may have a root in shared memory. "It is difficult to say that a smell will generate a common emotion, as everyone interprets it with their own experience," he says. "But if there is something that is universal, I would probably think of smells common to our childhood, which we had before our cultures were teaching us different usages. I think of a baby smell, and musk comes to my mind."

The quest to create the "perfect scent" is at the heart of Patrick Süskind's dark novel, *Perfume: The Story of a Murderer*. In real life, the idiosyncracy of scent preference means creating a universally adored fragrance is an impossible task, and even perfumers, of course, have their own connections to certain smells. However, Rasquinet believes that our noses can be trained to explore scent diferently. "My nose is mainly a tool for verifying my ideas," he says, "Perfumers also need creativity, curiosity, and a good 'olfactive memory' so that we can use the stock we have in our brain of thousands of raw materials and imagine what new olfactive forms we could create by blending dozens of them together."

He adds: "Our library of smells is expanding every day. Perfumers are humble people, always learning. Even in the most common raw materials, we can still find new ways of using them to create new scents. And regarding our smelling abilities, I realised when I was studying with [legendary perfumer] Pierre Bourdon that the more I was smelling a molecule, the more the olfactive receptors of my brain were able to detect it at lower levels. The nose acts like a muscle and it can be trained."

So could my attraction to spicy, smoky scents stem from my childhood? Perhaps from the memory of my mother cooking up curries? "It's perfectly right to say that personal background and, I would even say, emotional background is one of the reasons why we are drawn to certain perfumes and not to others," says Jennifer Michaud, scent design manager at IFF Middle East, who functions as a fragrance evaluator and creative support to perfumers. "If a certain smell is associated indirectly in your mind to a happy moment, you will be attracted to perfumes that have the same notes. Similarly, if a scent is linked to an unpleasant time or experience in your life, most likely any scent with that note in it will put you off—for example, many people associate the clove note with smell of the dentist, so if they perceive that note in a perfume, they won't like it."

It's possible to start training your nose to identify the notes you do and don't like, and to notice how different scents are associated with different moods and memories for you. Context and environment will change the experience of a scent for you, too, and that's why Michaud recommends repeatedly testing new perfumes at different moments throughout the day to see how you feel about them. And while your history may lead you to pick a new perfume, it's up to you to create new memories to be forever conjured by a mist of that scent.

Our sense of smell *has an almost direct connection* **with the parts of the brain that govern emotion and memory.**