

The tantalizing scent of rain or freshly baked bread: How certain smells transport us back in time

September 28 2023, by José A. Morales García



Credit: AI-generated image ([disclaimer](#))

My father was a carpenter, meaning I have spent a great deal of my life surrounded by wood, saws, planes and chisels. Simply by living among sawdust and woodchips, you learn to distinguish the different smells of wood.

Years after my father retired, I was walking through the underbelly of a hospital when, completely by chance, I stumbled upon the maintenance room. The smell of that room enveloped me, traveling instantaneously through my [olfactory mucosa](#), to the olfactory nerve and then the [olfactory bulb](#) which, after a swift analysis, directed it to my limbic system.

Suddenly and unexpectedly, I was transported back to my native Toledo (in Spain), to my father's carpentry workshop. It had been closed for years and I had never given it much thought, but for a second I felt I could see him in front of me, sanding block in hand, beckoning me over to help. And as if by magic, all the stress of my day began to evaporate, giving way to a serene sense of calm and happiness.

The noise of a nearby elevator snapped me back to reality.

Smells that revive past emotions

Is it possible that the mere smell of freshly cut wood had transported me back 20 years, and that my hippocampus was dredging up memories that I did not even know were there?

These kinds of occurrences are very common, as, undoubtedly, you can confirm. The scent of freshly baked cakes or bread, the chlorine of a swimming pool in summer, a salty sea breeze, coffee, and rain are smells that cause our minds to recover memories and emotions that we thought long forgotten.

Memory is the brain's ability to compile, store and recover information based on [past experiences](#). But what kinds of experiences are most easily stored? It is those connected to emotion, whether positive or negative.

Our memories are like a bottomless drawer. The amount of information

they can store is infinite, but it is not always easy to access. This is because our brains tuck away things that they consider to be less important at any given moment. The more hidden a piece of information is, the more difficult it is to retrieve.

Numerous scientific studies have tried to discover how we can recover memories and sensations from the past through a particular smell. This is known as [olfactory memory](#).

A direct line to emotional memory

The [sense of smell](#) is strongly connected to different areas of the brain, such as the limbic system and the orbitofrontal cortex. The former is essential in creating [emotional responses](#) to smells, while the latter helps to identify and distinguish them, as well as linking them to specific experiences and memories.

Before it reaches the [cerebral cortex](#), information from the other senses must first pass through a control system, the thalamus. The sense of smell, however, has a VIP pass, and it bypasses the thalamus to connect directly to the brain's memory circuits, located in the hippocampus.

For this reason, a familiar smell activates the same areas of the brain as those related to emotional memory. In fact, scent induced memories tend to be connected to past experiences with a greater emotional significance than other senses.

The loss of smell, a sign of neurological illness

Much like other senses, our sense of smell seems to diminish as we get older, but it can also be linked to various disorders. Many of us experienced this first hand [during the COVID-19 pandemic](#), when

millions of people lost their sense of smell. For most this was temporary, but for some it was permanent.

Intriguingly, many disorders linked to a loss of smell are neurodegenerative, where one of the associated symptoms is [memory loss](#).

It is significant that this deterioration of smell may precede other problems, as it can therefore be used to predict almost 70 [psychiatric and neurological conditions](#). Continued decline in the ability to detect odors heralds the loss of gray matter—mostly made up of neurons—in the hippocampus as [mild cognitive impairment \(MCI\)](#) sets in, and then subsequently progresses to [Alzheimer's disease](#).

In fact, a declining sense of smell can [predict](#) whether individuals with MCI will develop Alzheimer's in the future. But this does not just help to detect dementia: it can also be a sign of [cognitive dysfunction](#) and precedes or develops alongside a wide range of conditions such as [Parkinson's disease](#), [Lewy body dementia](#), [Creutzfeldt-Jakob disease](#), [alcoholism](#) and [schizophrenia](#).

Olfactory gymnastics to rehabilitate your memory?

In the case of people suffering from neurological conditions such as Alzheimer's or Parkinson's, the absence of olfactory stimulation in the brain can actually cause other symptoms to worsen. In fact, [several studies](#) have drawn a connection between a strong sense of smell and a lower overall risk of mortality.

Consequently, in recent years there has been interest in determining the therapeutic potential of scents to stimulate and rehabilitate memory in patients with neurological disorders.

Information available to date suggests that there is a connection. Olfactory enrichment—smelling a range of different scents—can reverse [loss of smell](#) caused by an [infection](#), [cranial trauma](#), [Parkinson's](#) and [aging](#). This improvement is associated with an increase in cognitive and memory capacity.

The method for this form of therapy could not be simpler: results are achieved by exposing people daily to various scents. A recent study supports the idea that two hours per night, over six months, is enough to improve [memory](#) function.

Obviously, more research is needed to definitively conclude that regular olfactory stimulation helps to protect the brain and prevent cognitive decline or impairment.

Until this happens, I will return to my father's carpentry shop, thinking of these words by Marcel Proust: "Perfume is that last and best reserve of the past, the one which when all our tears have run dry, can make us cry again."

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Provided by The Conversation

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