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Smell, Our Most Underestimated Sense

Analysis by Dr. Joseph Mercola Fact Checked | August 25, 2022

STORY AT-A-GLANCE

- Humans are largely not aware of their olfactory powers, which serve many purposes; newborn babies have strong olfactory responses
- Experts think when we shake hands with a new person, we use our sense of smell to size them up
- Plants use odors to attract bees for pollination and to warn other plants about pests
- Dogs have amazing olfactory abilities because of their large noses, which can even detect cancer
- Most of what we think is taste actually comes from our sense of smell

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We humans do not appreciate our sense of smell. Compared to other senses like vision and hearing, we tend to ignore the information from our sense of smell with the exception of flowers, food being prepared and, of course, those lucky people who have discovered aromatherapy.

But according to the documentary, "Smell — Our Most Underestimated Sense," our sense of smell affects us much more than we realize. Certainly, we know that it protects us from dangers like fire because we smell the smoke, explosions because we smell

natural gas and food poisoning because we smell spoilage. But few realize our sense of smell also lets us "read" other people much like dogs "read" each other by sniffing.

Of course, the olfactory read that humans conduct is not as obvious as that of dogs sniffing but, according to this film, people will oftentimes sniff their hands after shaking hands with someone new, indicating that important information has been gained. The sense of smell also helps newborns bond with their mothers, and "smell dysfunction" can impair such bonding.

Nevertheless, smell is so underappreciated people interviewed in the documentary said they would rather lose it than their "access to technology," such as their smart phones. If you're inclined to agree, after watching this remarkable documentary, you just might change your mind.

Aromatherapy Takes a Clue From Nature

I am a big believer in aromatherapy, which is based on the use of essential oils, also called volatile oils. In addition to inducing relaxation and sleep, and reducing blood pressure[1] and stress, aromatherapy may be beneficial for depression,[2] anxiety,[3] dementia[4] and pain relief.[5]

According to "Smell — Our Most Underestimated Sense," plants and flowers also use these healing fragrances for themselves! For example, flowers deliberately emit the chemical signals of a female bee so that the male bee will "mate" with the flower and pollinate it. Certain birds, butterflies, bats, moths and even honey possum also pollinate flowers.

The irreplaceable services of these pollinators are seriously threatened by pesticides and chemicals, posing an environmental crisis. It is important to remember that every time you shop for organic food you vote against these harmful chemicals that are creeping into our daily life.

Interestingly, the least pretty flowers are often the most fragrant ones, because they cannot rely on their visual beauty to attract pollinators says the documentary, Moreover,

plants can emit odors to warn other plants of impending insect attacks, just as animals warn others about imminent predators.

Sensing Others Through Our Sense of Smell

Many have heard of the phenomenon of menstrual synchrony in which women who live or work together can begin to have their periods at the same time.[6] In a T-shirt sniff study, says the documentary, women's testosterone levels changed in response to the scent of another woman, depending on where that woman was in her monthly cycle — though, of course, the women were not consciously aware of this.

Paul Moore, a professor at Bowling Green State University who specializes in chemical ecology and the role chemical signals play in an organism's ecological role, explains the reaction like this:[7]

> *"The chemical senses, I call them ninjas — they're hidden. So, they go into our brain, and we're not aware of it, we're not conscious of it, so it makes us respond emotionally, respond physiologically, before we actually think about the response. So, it's very subtle and it's very hidden ...*
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> *Testosterone is tied very much to social dominance and in competitiveness and aggression. And up-regulating or down-regulating testosterone through chemical signals could change your competitiveness."*

Why would this happen? From an evolutionary standpoint, fertility could be governed by a competition won by dominant females so that less "alpha" females would cease to compete for males at a certain time.

The Hidden Powers of a Handshake

Our sense of smell does not just determine sexual rivals and fertility competition. In one study cited by the documentary, a hidden camera filmed people meeting strangers for the first time and sometimes shaking their hands. Greeters who shook hands smelled

their hands afterward twice as often as those who didn't shake hands, presumably accessing the "information" the handshake gleaned.

Shaking hands is likely a human version of dogs sniffing each other — a way of acquiring a lot of social information in one quick impression, says Moore. When dogs sniff each other upon meeting, for example:

> *"They're sniffing and saying, 'Oh, I played with you last week. You're a good dog to play with,' or 'I smell you from last week. You were a little mean, so I'm not going to play with you.' They're going to pick up their dominant status, social status, their reproductive status, what they've eaten. All that kind of stuff that you and I would share in a conversation with words, they share with chemical signals. Their whole world is sense of smell."*

Man's Best Friend Can Save Our Lives

One of the most dramatic facts shared in "Smell — Our Most Underestimated Sense," is dogs' proven ability to detect cancer in humans from subtle smells in breath, skin and more. Dogs have up to 300 million receptor nerve cells that detect smell (compared to 5 million in humans) and some dogs have been successfully trained to detect human cancers.

In a 2015 study published in the Israel Medical Association Journal,[8] two dogs picked out the breast cancer cell cultures that they had been trained to detect 100 percent of the time. These "detective" dogs even picked out cancer specimens they were not trained to detect, but they never picked out control (noncancer) specimens, meaning "false positives," which plague diagnostic methods that are more high-tech than dogs.

The dogs picked out early-stage cancer as well as advanced cancer with amazing accuracy and specificity — a skill that would clearly save lives. In a 2017 study published in the European Journal of Cardio-Thoracic Surgery,[9] a trained dog was also able to detect early lung cancer from the exhaled breath of patients with remarkable accuracy. Here is what the researchers wrote:

"After appropriate training, we exposed the dog (a 3-year-old cross-breed between a Labrador retriever and a pitbull) to 390 samples of exhaled gas collected from 113 individuals (85 patients with LC [lung cancer] and 28 controls, which included 11 patients without LC and 17 healthy individuals) for a total of 785 times.

The trained dog recognized LC in exhaled gas with a sensitivity of 0.95, a specificity of 0.98, a positive predictive value of 0.95 and a negative predictive value of 0.98."

Other Cancers Are Being Detected by Dogs

Canine olfactory abilities are also being studied in the screening for colorectal cancer (CRC) which takes the lives of approximately 50,630 Americans per year.[10] This is what researchers writing in a 2010 article in BMJ said:[11]

"Among patients with CRC and controls, the sensitivity of canine scent detection of breath samples compared with conventional diagnosis by colonoscopy was 0.91 and the specificity was 0.99.

The sensitivity of canine scent detection of stool samples was 0.97 and the specificity was 0.99. The accuracy of canine scent detection was high even for early cancer. Canine scent detection was not confounded by current smoking, benign colorectal disease or inflammatory disease."

Such noninvasive and economical methods for early detection of colorectal cancer that avoid colonoscopy are sorely needed. Currently the occult blood test is one of the few affordable tests in the doctors' colorectal cancer arsenal.

Dogs can also detect the specific volatile organic compounds associated with prostate cancer in urine samples with high estimated sensitivity and specificity according to a 2015 study.[12]

And, in a 2013 study, dogs correctly identified all 42 blood samples of patients with ovarian cancer, achieving an accuracy rate of 100 percent.[13] Even more encouraging, the dogs could determine whether cancer cells remained after surgery, which is crucially important since doctors generally cannot determine if residual cancer cells remain.

How Were Dogs' Medical Abilities Discovered?

How did an awareness of such canine abilities and their possible use in medicine develop? Here is how the researchers trace the origins of such dog detections:

> *"The idea of using a dog's olfactory sense for the early detection of cancer was first raised by Williams and Pembroke and reported in The Lancet in 1989. These authors described the case of a patient who visited the clinic because her dog showed a particular interest in a skin nevus she had. Following its excision, the pathological examination revealed malignant melanoma."*

A 2013 case report in BMJ (previously the British Medical Journal) reported a similar phenomenon.[14]

> *"Our patient is a 75-year-old man who presented after his pet dog licked persistently at an asymptomatic lesion behind his right ear. Examination revealed a nodular lesion in the postauricular sulcus. Histology confirmed malignant melanoma, which was subsequently excised."*

Another Important Function of Our Sense of Smell

Do you like different flavored jelly beans? People tasting them in "Smell — Our Most Underestimated Sense" quickly discovered that most of the "taste" was from their sense of smell not their sense of taste. When they were asked to pinch their noses, most tasted nothing.

One subject said he tasted "nothing so far." Another said, the jelly bean had "like, a sweetness, but I don't know the flavor." Once the subjects unpinched their noses they

could describe the exact flavor of the jelly bean — which was really a smell. The loss of smell had a profound effect on Anna Barnes, featured in the documentary.

> *"I had a bad hit to the head, so I was kind of recovering from that. And then about a week afterwards, I thought, 'Hold on, something's not quite right here.' It became very clear to me, when I was well enough to go outside, that I'd lost my smell, because back then, the sewerage was open sewerage.*
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> *So, I lost my appetite for the first, I would say, four months. I was kind of retraining myself to remember, 'Oh, no, you have to eat' ...*
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> *When I lost my taste, fruit tasted for me, terrible. It's just gross. Fruit just tastes really slimy. It's all about texture ... I also had some early, you know, mix-ups, of accidentally drinking vodka, thinking it was water. And, you know, all the kind of stereotypical things that I guess people worry about."*

It is clear that from "reading" other people to determining dangers to our enjoyment of food, our sense of smell is crucial — and certainly more important than our access to technology if we were asked to choose. Just as eye-opening is the ability of man's best friends to use their olfactory natural abilities to detect cancers as accurately as the most high-tech machines.

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