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# How Dogs "See" the World Through Different Odors

Let them exercise their noses.

Posted Feb 23, 2019



*Dogs' supersensitive noses are legendary, so much so that their approach to life could be summed up as "[sniff first, ask questions later](#)."*

*With [300 million receptors to our mere 5 million](#), a dog's nose is estimated to be between 100,000 and 100 million times more sensitive than a human's.*

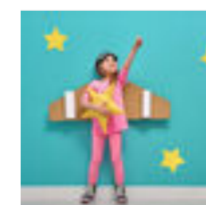
**"His walk is for him and I let him sniff as much as he likes to fill his nasal needs."**

Yesterday morning, as I walked home from a coffee shop in Boulder, I saw a huge mutt, Bernie, begin sniffing the base of a tree, and around 36 seconds later he finally lifted his big head appearing satisfied that he'd gotten all there was to get from whatever it was he was sniffing. Because I'm interested in everything "dog" and everything "dog-human" interaction, I stopped and mentioned to the woman, Marianne, that I was thrilled she let him exercise his nose for as long as he chose to do so.

Marianne laughed and said, "His walk is for him and I let him sniff as much as he likes to fill his nasal needs." I loved the phrase "nasal needs," and we talked a few minutes until Bernie, anxious to exercise his nose once again, pulled Marianne along to the base of another tree and sniffed and snorted as if he'd never done so before. Marianne was sure that he was sniffing the scent left by the same dog who was being "dragged along the street by his owner." It pains me to see people ignoring their dogs' nasal and other needs as the dog clearly is resisting their being yanked here and there.

Bernie was in dog heaven as far as I could tell, and Marianne was okay with

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letting him dictate where they went and for how long. And, when she had to get going for one reason or another, they went home and she felt good that Bernie had sniffed and snorted to his nostrils' content. Of course, Bernie was likely exercising his nose even when he was walking and Marianne wasn't aware of him doing so. Dogs are constantly picking up smells when they stood still during their walk here and there.

As visual creatures, the sense of smell is difficult for humans to understand and therefore to appreciate in the dog. We can't see odors. However, the dog's nose is the organ most people are curious about because it's so much more sensitive than our own, and dogs use it most of the time, often in ways we wish they didn't. On many occasions, we simply don't understand why they're doing what they're doing as their nose leads the way.

Anyone who's had the good fortune of sharing their homes and hearts with a dog knows they need to exercise their senses as well as their bodies. This is one of the main messages of [Dr. Jessica Pierce](#) and myself in *[Unleashing Your Dog: A Field Guide to Giving Your Canine Companion the Best Life Possible](#)* in which we discuss all five senses, how they work, and what humans can do to allow their dogs to maximize their sensory delights and have a good old time doing so.



A dog's nose  
Source: Suzzamar, Pixabay free download

Here are a few facts about dogs' legendary and amazing noses. Anyone who's spent even a short amount of time around dogs knows they love to snort and sniff just about everything, including odors that we find utterly repulsive. We all know dogs like to stick their noses everywhere, and they often snort

when they're doing it or shortly thereafter. Their supersensitive noses are legendary, so much so that their approach to life could be summed up as "sniff first, ask questions later."

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When they can, dogs will spend upwards of 33 percent of their time with their noses pinned to the ground, and we also know they'll freely put their noses into body parts, including groins and butts, that we think are disgusting and totally inappropriate. For example, I have written about various dogs including Bernie and Beatrice, "the butters," and Gus and Greta "the groiners," along with Sammy the schnozzola—whose noses know no bounds. These dogs can't stop shamelessly running up nose first into everyone's privates, which always ignites many questions about what dogs are smelling and why, since they clearly enjoy it.

When the dog's nose is wet and cold it is easier for them to detect odors, due to glands that produce an oily fluid. How odorants enter the nostrils and the structure of the nose itself, with its olfactory recess located farthest back in the nostril, are both important for dogs' keen sense of smell. When a dog sniffs, the air follows a side route and enters the olfactory recess, which contains genes for olfactory receptors, and olfactory receptor cells that absorb odorants. The olfactory mucous membrane is spread across a labyrinth of bone structures called nasal turbinates and is covered with millions of tiny olfactory hairs which capture odorants.

When gaseous odorants come into contact with the olfactory membrane, they are dissolved in the layer of mucus. Odorants that are easily dissolved are released in the front part of the olfactory recess, while moderately soluble and insoluble odorants are distributed more evenly across the entire olfactory recess. How the odorants are deposited therefore plays a role in compound recognition. After the odorants have passed the olfactory receptors, they are transformed into an electrical signal that travels via the olfactory nerve to the olfactory center of the brain where the information is interpreted.

There are many surprises about the dog's nose. Many of us have heard that the dog has a much better sense of smell than human beings. In general, the dog's nose is 100,000 to 1 million times more sensitive than the human's, while the bloodhound has a nose that is 10 to 100 million times more sensitive than ours. The section of a dog's brain related to processing smells is almost seven times larger than ours. In addition, the dog's fantastic sense of smell can be explained by the fact that dogs don't exhale when sniffing a faint scent. This enables the dog to sniff faint odors without disturbing or destroying them. Dogs have a wing-like flap in each nostril that determines the direction of the airstream in and out of the nose. When the dog inhales, an opening above and beside this flap allows air to pass through. When the dog exhales, this opening closes and the air comes out below and beside this flap through another opening, enabling the dog to increase its collection of odors. As a result, the warm air that is exhaled flows backward and away from the odor being sniffed, preventing them from mixing.

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Dogs also use their nostrils differently according to the nature of the scent. During behavioral trials, when dogs sniffed at unfamiliar smells that were not dangerous, first they used the right nostril and then switched to the left nostril to sniff at the odors again. Once they had become familiar with the smell, the left side of the brain took over. When they sniffed sweat odors from veterinarians who worked at a kennel, they used only the right nostril. In short, the left and right sides of the brain take in different kinds of information. The right side of the brain is associated with intense feelings, such as aggression, flight behavior, and fear. For most dogs, a veterinarian is a frightening person.

Unfortunately, not everyone is in Marianne's camp. For example, in response to an essay I wrote titled "[Allowing Dogs to Sniff Helps Them Think Positively](#)," I received this surprising email message from Michael: "Wow, did you really just tell dog owners to just let their dogs just sniff and pull themselves wherever they wanted to go. Next, you will be telling parents to just let their kids run crazy all around screaming their heads off because of what one study might be leaning towards. Just to inform you, they made playgrounds so that children can play in, they made scent games so that dogs can work their nostrils. Maybe before throwing out suggestions, you wait till further studies have been done and a more solid conclusion is coming out of it before you start suggesting what dog owners should or should not let their dogs have free range with."

In fact, my essay was a summary of a seminal study conducted by Drs. Charlotte Durant and Alexandra Horowitz called "[Let me sniff! Nosework induces positive judgment bias in pet dogs](#)" that's *in press* in the journal *Applied Animal Behavioural Science*. And of course, I did nothing of which Michael accuses me. I do argue that a dog's walk should be for them, or at least mostly for them, but I never ventured into what parents should tell their children. Also, Michael ignores that I was reviewing a solid scientific study and wasn't merely "throwing out suggestions" or unsupported ideas. Indeed, there are many more studies that show how important it is for dogs to be able to sniff. (See "[Dogs' Noses in the News: Scents Reduce Stress in Shelters](#)," "[Secrets of the Snout: A Dog's Nose Is a Work of Art](#)," an interview with Norwegian dog nose expert Dr. Frank Rosell who tells us all there is to know about dogs' noses and why they never seem to get enough

of using this amazing organ in his recent book called *Secrets of the Snout: The Dog's Incredible Nose*, and *Canine Confidential: Why Dogs Do What They Do*.)

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### **A dog's walk is for them to unleash their nose and let them sniff and snort to their nostrils' content**

“You may not agree, you may not care, but... you should know that of all the sights I love in this world — and there are plenty — very near the top of the list is this one: dogs without leashes.” (renowned poet, [Mary Oliver](#))

Kudos to Mary Oliver. Even if your dog spends a good deal of time on a leash or other tether, it's important to "unleash their nose." Concerning an activity in which many if not most dogs and humans engage, the bottom line is simple: Let a dog's walk be for them, and if they're pulling you here and there with their nose pinned to the ground and occasionally snorting, let them do it. I've often thought that not allowing dogs to sniff and to exercise their nostrils and other senses could be a form of sensory deprivation.

Thus, I was happy when a woman at a dog park once said to me, rather seriously, that she thought that not allowing dogs to use their noses the way they want could cause serious psychological problems. I've thought about this a lot since then. We really don't know if dogs suffer psychologically when they're deprived and can't fulfill their need to sniff and pee if they choose to do so. Surely, when dogs have rushed along, they don't get to savor and properly assess and process various odors, and who knows what this does to them. This form of sensory deprivation might be devastating since they lose detailed information about their social and nonsocial worlds. When we're absorbed in an activity, we don't like being rushed along before we're finished savoring whatever there is to enjoy.

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## A dog's legendary nose is a work of art and they need to use it

*"It is said that a dog who has lost its sense of smell is no longer a dog."*

(Dr. Frank Rosell)

All in all, a dog's nose is a work of art, an exquisite adaptation, evolution at its best. And all without a plan or goal. When people tell me they wish they had a dog's nose, I hasten to add they should be careful what they wish for. I'm happy to know about this most remarkable adaptation, but even I don't have any desire to experience all of the many odors dogs take in and clearly savor.

In *Unleashing Your Dog* Jessica and I discuss how important it is to let dogs sniff, how much information they receive from "pee-mail," how we should let them roll in "icky stuff" to some extent, how we need to protect what she calls their "[scent identity](#)," which means we shouldn't be showering them with perfumes and deodorants that we like, how we need to avoid olfactory overload, and how butts and groins may serve as "critical canine communications centers." We also offer some words about burps, gas, and doggy breath.

Dogs' sense organs, like their muscles, heart, and lungs, need to be exercised, and we need to make time for them to do so. I hope dog trainers/teachers will incorporate this message when they work with their clients. Stand by for further discussion of dogs' senses, how they work and how to allow them to maximize their use to give them the best lives possible. It's really not that difficult to allow dogs to be dogs and when they're able to exercise their senses we can learn a lot about what they want and need. By becoming fluent in dog it not only improves their lives but also can improve the social bonds we form with them, relationships that require mutual and reciprocal respect and tolerance; a win-win for all.

I thank Jessica Pierce for her collaboration on this and many other projects.

I've gotten some very supportive comments, and here are two of them:

"I absolutely love your piece here! Four years ago I began walking a couple of people's dogs for them in order to supplement my Social Security and to get additional exercise. Though I've had several dogs during my life I hadn't had one in years so getting to know these three dogs over these four years has been really enriching for me. I've come so far in my understanding of

them and awareness of what they truly enjoy doing so these last two years I make every effort to just let them do what they like to do, especially with their sniffing. I can't recall where I first read about how important sniffing really is to them but once I learned I really toned down my approach to walking them.

"Four years ago I thought they needed to be walked vigorously without much stopping, for their exercise, but when I really examined what was going on I was actually walking them how I as a human wanted to be walking. I feel ashamed about that now but I did make a 180 degree turn around and now just let them sniff as much as they want for however long they want without any pressure to "come along." Our walks together are now much more enjoyable for all of us! I'm really looking forward to reading your dog books!" (Geraldine Green)

"Thank you for this important essay. I always have supported people learning as much as possible about dog behavior, and I try to ask people nicely why are you dragging your dog along when clearly there is something they want to smell. Their nose is their eyes, and when your dog says stop or slow down, please listen to them. They have to be allowed to satisfy their nasal needs, as Marianne put it." (Stephen)



## About the Author

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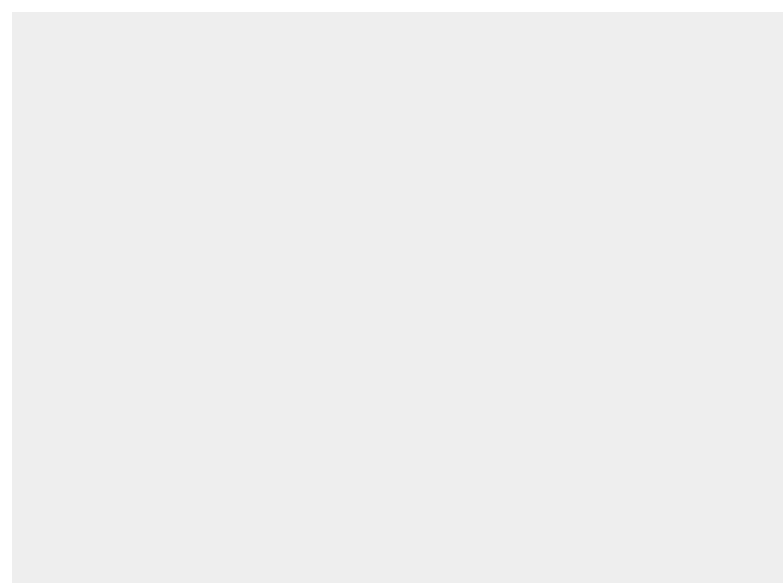
**Marc Bekoff, Ph.D.**, is professor emeritus of ecology and evolutionary biology at the University of Colorado, Boulder.

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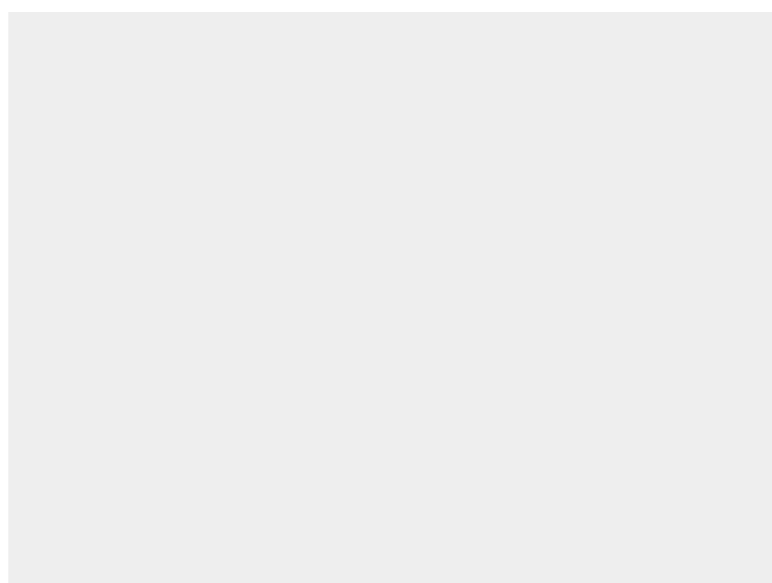
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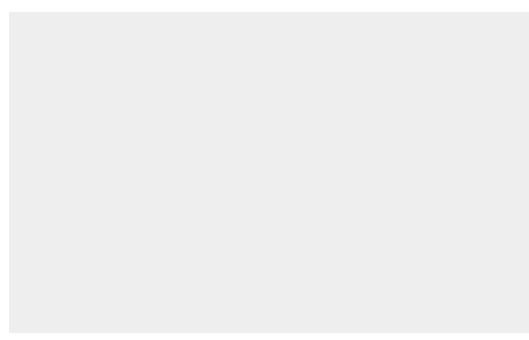
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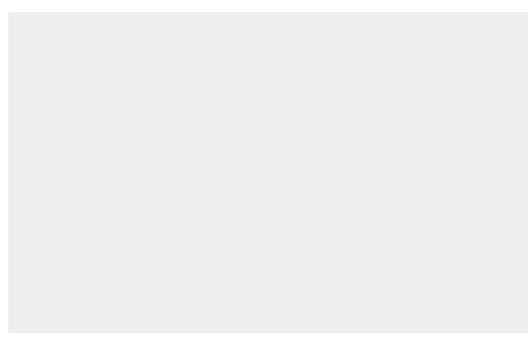
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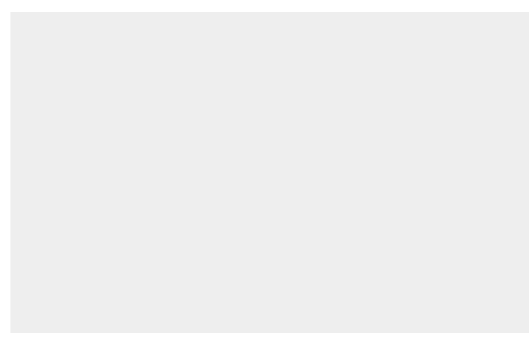
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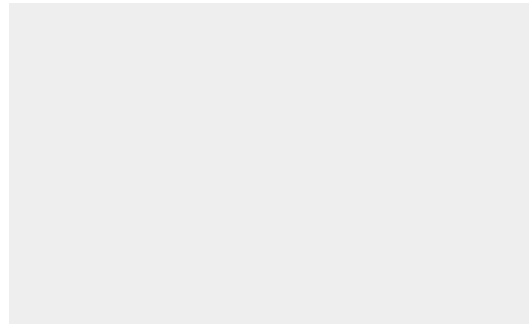
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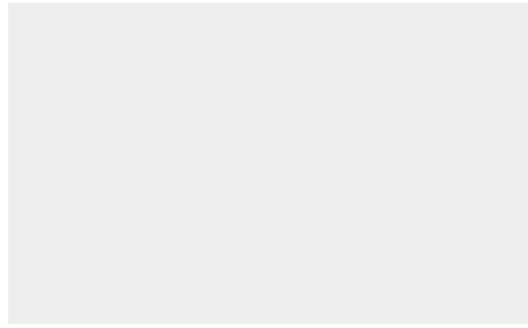
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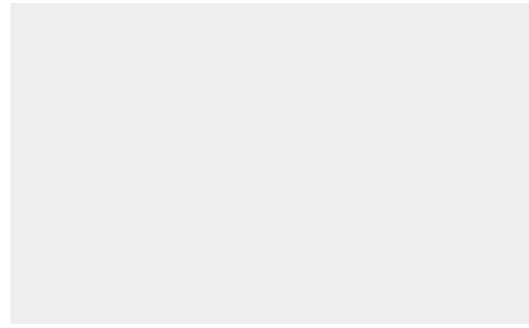
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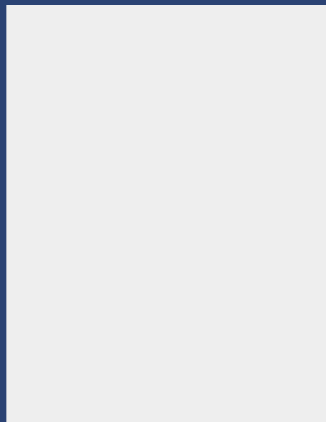
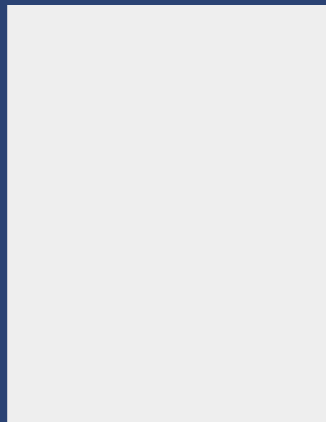
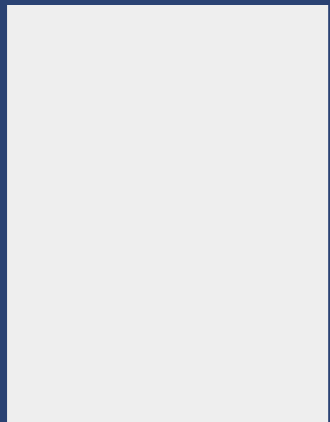


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