

Your complete guide to natural dog care and training

Whole Dog Journal™



On page 3. Training begins now! Or yesterday! – Puppies are ready to learn what you want (and don't want!) from them beginning the moment you bring them home.



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On page 12. Scared to get out of bed? – Your dog may be experiencing so much stress that it's affecting her behavior; here's how to tell.



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On page 16. K9 conservation corps – Dogs can use their noses to save threatened animals.

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Good Reads

There's a more eclectic mix of dog-related topics than usual in this issue.

For the most part, the articles in WDJ contain information that you can go right out and put into practice – training tips, food-selection suggestions, product reviews, and practical things that you can do improve your dog's health. While we do have a couple of those in this issue, we also seem to have collected a number of articles that (we hope) will provide you with food for thought, too.



The first article that falls into this latter category, “Howling in the Uncanny Valley,” is found on page 9. The article sprang from an online conversation I had with its author, trainer Heather Houlahan, as we commiserated about how much we both hated the computer-generated imagery (CGI) used to wholly create the dog in the new movie *The Call of the Wild*. The human expressions the movie artists covered the otherwise winsome animated (but real-looking) dog's face with absolutely gave me the shivers – and not the good kind. Heather and I both felt our skin crawling with revulsion when we saw the CGI dog's weird gaits and human-looking eyes – yet we know other people who didn't detect anything wrong with the depiction of the dog at all. When Heather asked me if I'd like her to write an essay expressing why she felt this sort of unreal, sort-of-real-looking dog's appearance in a popular movie could actually do damage to the human-animal bond, I was more than happy to give her the assignment.

I had never before heard the expression “the uncanny valley” before I received Heather's piece, and I found it fascinating to follow a number of online links from the Wikipedia.org page that defined the term. The observations made about the creepiness of human-like robots in those articles definitely rang true for me – but even more strongly to the CGI dog in *The Call of the Wild* than for human-like robots. I'll be curious to hear what *you* think about all this.

Another eclectic piece in this issue that I was fascinated by: long-time contributor CJ Puotinen's article on page 16 about “conservation dogs” – dogs who are trained to find endangered animals (as well as the poachers who threaten them). The dogs are also used to sniff out invasive plants and animals that threaten native populations and habitats! I'm not exactly sure how many of you will go out and train your own dogs to do work like this – but if any of you want to, there are some stellar role models and organizations mentioned in the article that would provide guidance to do so.

I think it would be the coolest thing ever if one of our subscribers read about this work and was inspired to take it up with their dog. *Please* let us know if that person is you!



Give Your Puppy a Smart Start

Wondering when and how you should start training your puppy? Immediately!

When it comes to puppy training, it's never too early to start. Puppies are more than ready to learn by the time they leave the litter and transition into a home. After all, they've been learning since birth, so why not keep the ball rolling as soon as you welcome a puppy into your family?

It's our responsibility to teach puppies how to successfully live in our human world, which has a rule structure quite different from what they're used to with their littermates. There are plenty of options for positive-reinforcement training starting at a young age: a well-run, in-person puppy kindergarten class; one-on-one instruction with a trainer; an online program; books and videos; your own knowledge of training; or a combination of options. No matter what you opt for, starting sooner, not later, is key to success. From the first day you bring your puppy home, have these three basic principles in mind:

1 HAVE CLEAR GOALS FOR YOUR PUPPY'S BEHAVIOR FROM DAY ONE AND SUPPORT HIS UNDERSTANDING OF THEM EVERY DAY.

It's important to have some basic training goals before your puppy comes home, so you can create clear behavior contingencies from the very beginning.

Your puppy is constantly learning. From the moment he sets paw in your home, he will be learning which behaviors get him things he wants and which ones don't. Make it easy for him to get what he wants when he does behaviors you like, and prevent him from getting what he wants when he explores behaviors you don't want him to practice. The more black and white your expectations, the easier it will be for the puppy to figure out what works for both of you.

So, as just a few examples: If you don't want a grown, 80-pound dog jumping on you to get your attention, avoid petting the tiny, 8-week-old puppy when he jumps on you. Instead, if he happens to sit or even just greets you with happy eye contact and all



four paws on the floor, go ahead and tell him what a good puppy he is and lovingly give him all the petting he wants! If you want a well-housetrained dog, commit to paying close attention to your puppy's need to eliminate, not giving him a single opportunity to "make a mistake" indoors. And if you don't want your adult dog to sleep with you on your bed or your nicest sofa, don't allow the puppy to do so, either.

Gray areas are challenging for dogs. It's not fair to make exceptions to what we know our rules will be later (because the puppy is so cute!) and then change the rules as she grows. It's also harder to "fix" unwanted behaviors than to train correct behaviors from the beginning. (For more about this, see "The Biology of Early Learning" on page 6.)

"Catch her doing something right" whenever possible! When you notice your puppy doing anything you like, such as sitting calmly and quietly, or chewing on one of the toys you bought for this purpose, let her know she's being a good dog! Offer her a treat, praise, and/or a little bit of calm petting.

2 MAKE YOUR INTERACTION WITH YOUR PUPPY REWARDING AND ENGAGING.

Teach your puppy that spending time with you is *fun!* Be generous with rewards of food, attention, petting, and play so the puppy is eager to focus on you in anticipation of enjoyment.

A great strategy is to aspire to feed more of your puppy's daily ration of food from your hand than from a bowl. This makes you the primary source of a pretty great thing and gives you plenty of calories to leverage to your advantage by reinforcing any behavior you'd like to see more of.

Be super generous with rewards with a young puppy because, as the puppy matures, environmental distractions will become more interesting, and it's helpful for the puppy to have a strong history of finding you rewarding. This makes



Build a strong history of reinforcement (with treats, toys, praise, and play) for behaviors that you like from your puppy; she will strongly associate you with all these good things, helping cement a solid relationship between you.

it easier for the puppy to continue to choose you, and what you have to offer, over the environment. No need to worry the pup will end up

“only doing it for the food.” Since the food comes directly from you, you gain value by association. Plus, when you pair praise and petting with the delivery of food, the food increases the value of your praise and petting, so it is more reinforcing in the future if you choose to use fewer food rewards in training.

Don't forget to mix lots of play into your interaction. It's fun (for puppies and people!), it breaks up training sessions, and studies show following learning with play can lead to improved performance in subsequent sessions, when compared to immediately following learning with an opportunity to rest. Playing with your puppy, in ways you both enjoy, convinces your puppy that you're a blast to be around because you know how to play all the best games. Who doesn't like hanging out with the fun guy or gal?

What you can expect?

With frequent, short training sessions, most young puppies can start offering simple behaviors like “sit” in anticipation of “good stuff” as early as 6 to 7 weeks old, even before they leave the litter. If you really want to stack the training deck in your favor, look for a responsible breeder or rescue that provides early enrichment and basic training opportunities to young puppies in an effort to set them up for success when they meet their new families.

If you're starting from scratch with the basics, it's still reasonable to expect a young puppy to quickly learn to offer a “sit” for a food bowl or when approaching people, or follow a hand signal to lie down. In fact, in many cases, people report their puppies readily respond to cues for “sit,” “down,” “come,” “leave it” and a parlor trick or two by the time the puppy is 3 months old.

The catch? This degree of understanding is generally limited to the home environment. Sound familiar? “But he does it at home!” is one of the most often heard frustrations among dog owners when attending a group class or otherwise asking the dog to perform seemingly “known” behaviors away from home. Learning to do these behaviors in the face of a highly distracting, enticing world takes a little more time and maturity.

Learning the physical mechanics of the behavior is easy. Adding duration, making the behavior resistant to distractions, and properly generalizing the behavior so the dog understands the same rules apply anywhere, anytime is a process that takes time and patience. Try to avoid thinking your puppy truly knows a behavior until you've seen him be successful under a wide variety of circumstances. Until that point, he's learning a behavior. Working in a new environment, around new people, other dogs, interesting smells, etc. makes it harder for the puppy to perform correctly. People often become frustrated and view the pup as being “stubborn,” when really, he's just not developmentally mature enough to concentrate for long periods and in the face of distractions. He'll get there with patience, maturity, and continued training support.

3 KEEP TRAINING SESSIONS SHORT BUT FREQUENT.

Like young children, puppies have short attention spans. The most effective training happens frequently throughout the day, but in short sessions each time, and with a high rate of reinforcement. Three to five minutes is perfect for a young puppy.

Try five repetitions of cheerfully saying your puppy's name when she's not looking, and rewarding her

when she turns to orient toward you. Practice “sit” and “down” a couple of times, changing your position relative to the pup with each repetition to help her begin to “generalize” the behaviors, understanding that “sit” means the same thing whether you are standing right in front of her or next to her.

Bust out a toy for a quick round or two of tug, trading the toy for a treat to begin a “drop it” behavior, then playfully run away from the puppy, encouraging her to follow you with a happy, “Let’s go!” as you take off. Reward her when she catches up to you, with treats or another one of her favorite toys. Aim for three to five short sessions each day. Also, remember every interaction is an opportunity for learning, so be prepared to help her practice desirable behaviors every time you casually interact with her, too.

Formal training sessions that are short and fun keep the puppy’s head in the game. More importantly, they teach the puppy to enjoy and look forward to training sessions, creating a pup who exhibits a happy conditional emotional response (CER) – that is, she becomes visibly excited – when our behavior starts to predict a training session is imminent.

THE BOTTOM LINE

When we bring a dog into our life, it’s our responsibility to teach them how to successfully live in our human world. Good training is a partnership. It’s not something we do to our dog, it’s something we do with our dog. It’s also ongoing. We get out of it what we put into it. With modern-day positive reinforcement training methods, it’s easy to make training an enjoyable way of life that creates treasured companions for years to come. 🐾

Stephanie Colman is a writer and dog trainer in Southern California. She works in the puppy department at Guide Dogs of America, helping to recruit and manage volunteer puppy raisers. Her previous puppy article for WDJ (“Puppy Social Studies,” May 2018) described how guide dog puppies are socialized and trained.

The Big “A” (Adolescence)

Trainers who teach group classes have seen it a million times: Owners bring their young puppies to “canine kindergarten” classes and are delighted with all the cues and behaviors they and their puppies learn to do. After graduation, a few months roll by, and gradually, more and more of those formerly delighted owners start reporting that their puppies “don’t know anything anymore!” Sit, down, come, stay – all the basic behaviors the pups “knew” when they were tiny seem to be gone! What gives?

The simple answer is adolescence.

Adolescence is a natural part of canine development. It’s generally said to begin when the dog is about 6 to 9 months old and lasts until about 18 months old. (Different breeds mature at different rates. Smaller breeds mature faster than larger breeds. Whereas a toy breed might be fully mature at 12 months old, a giant breed won’t fully mature until closer to 2 years old, so the adolescent phase will vary from breed to breed.)

Dogs go through lots of changes during this time – physical growth spurts, hormone surges, and an increased need to chew in an effort to fully set adult teeth into the skull. These physical changes generally coincide with the secondary fear period, a developmental stage where dogs often react fearfully to things they’ve been fine with in the past.

Much like in human adolescents, a hallmark of canine adolescence is a push for independence. Dog owners often report the adolescent dog is “blowing them off,” “being stubborn,” or otherwise seems to have forgotten everything she’s ever been taught.

Although it can be a trying time, patience is a virtue. Find ways to foster success and prevent failure in training. For example, if your young adolescent is overly distracted by other dogs when in a group class, add distance or use a visual barrier between the dogs to filter the distraction. If the dog is clearly driven by his nose, avoid letting him off-leash in unfenced areas. Avoid scary or painful punishers, as they can erode the relationship you share with your dog. The good news is, this too shall pass.



If you don’t want your puppy to chew your shoes or any other household items, make sure you provide him with a large and varied assortment of “legal” chew items and toys, so he always has “good” choices available.

The Biology of Early Learning

Puppies are often described as sponges due to their ability to soak up information, especially during their critical socialization period, which occurs between 3 to 12 weeks of age. To learn more about what goes on inside the puppy's brain, we reached out to Jessica Hekman, DVM, PhD, a post-doctoral associate with the Karlsson Lab at the Broad Institute of MIT and Harvard, where she works with the genomics of canine behavior.

"When a dog learns something new, the synapses between neurons become stronger, connecting the neurons more tightly, so that information – in the form of neurotransmitters – flows between them more readily," Hekman says. This process is part of what builds the brain's ability to take in information and make decisions based on that information.

One difference between the brains of puppies and adult dogs is that the puppy brain initially makes lots of extra synapses to support the puppy's ability to rapidly learn about the world. This means there are more pathways available for learning. This age-related increase in available synapses is short lived, as the brain can't sustain so many simultaneous pathway information exchanges at once. As the early socialization window closes, weaker synapses (those with fewer learning experiences) are weeded out in a "use it or lose it" process known as "pruning."

This is why thoughtful socialization during early puppyhood is so important. You want to strengthen the synapses for experiences like, "Strange men in hats mean cookies are coming!" due to repeated positive experiences with men in hats, and synapses for "Strange men in hats are scary" to be weak (because the puppy had few negative experiences with strange men wearing hats).

This is why it's also wise to begin basic manners training as soon as possible with a young puppy. We want strong synapses related to lessons like, "Four paws on the floor brings cookies and petting," "Running to my person when she calls my name makes her play with me," and "Lying on this dog bed makes good things happen." Conversely, we want synapses associated with less desirable behaviors to be weak. When pruning occurs, we're left with brain wiring that's better equipped to support behaviors we like and can continue to reinforce.

Hekman explains that, whereas a young puppy's brain is constantly evaluating situations (which is exhausting), by the time the early socialization window closes, the brain is relying more on its carefully pruned garden of knowledge and can start making assumptions about situations. Ideally, this is when you'll see a return on your



Dogs of all ages can learn, but Hekman notes that "the post-socialization brain doesn't make new learning connections (synapses) as easily as the baby brain." This is why it's unwise to wait until the puppy is 4 months old or older to begin training – or to assume she will "outgrow" undesirable puppy behaviors like jumping on or mouthing people. The more she practices these self-reinforcing behaviors, the less likely those synapses will be pruned away, and the more work it will take to replace the unwanted behaviors with the polite behaviors you prefer.

investment in thoughtful socialization via a dog who doesn't bat an eye around the tall stranger in a hat; the well-socialized puppy's brain simply assumes it's fine.

This is also why it's easier to teach desired behaviors from the beginning than to un-do unwanted behaviors. When a young puppy's synapses related to "Butt-on-floor brings good things" are stronger than synapses related to "Jump on the human to get what I want," the brain assumes "butt-on-floor" is the way to go, and we see a puppy who eagerly offers a "sit" in anticipation of good things.

"When you are helping a puppy make good associations during his socialization period, what you are really helping him do is to prune his synapses in a way that is appropriate for the world he's going to live in," says Hekman. "We want him to keep a lot of connections and to have them be good ones."

*To read more from Hekman about what's happening during socialization and early learning, look for her article, "Puppy Socialization: What happens inside the brain?" in the free e-book *Growing Up FDSA: Surviving Your Dog Sports Puppy*, available from Fenzi Dog Sports Academy at fenzidogsportsacademy.com.*



Dog Food Manufacturers

It's your dog's dinnertime . . . Do you know where his food was made? Does it matter?

Many of you are already aware that some pet food companies own and operate their own manufacturing facilities and some of them do not. You may have already learned that some brands of pet foods are made in several different manufacturing plants in different parts of the country. Some of you are familiar with the interchangeable terms *co-manufacturer*, *co-packer*, and *contract manufacturer*, which refer to a company that makes products for a number of other companies.

(Funny fact: Some of us know *a ton* about these pet food production facilities, and absolutely *nothing* about the ownership or management of the manufacturing sites where our *own* food is produced. Take from that what you will.)

We're often asked: Which of these situations is better? Is a pet food made in a plant that is owned and operated by the same company whose name is on the label better than products made by a co-packer?

The answer, like so many things having to do with pet food, is not so cut and dry; there are definite advantages and disadvantages of either situation. While it's interesting (and sometimes advantageous) to know where a particular product is made, we wouldn't base our selection of a product based solely on the information – unless we were aware

that a product was made at a facility that had been cited for a number of health violations. In that case, we wouldn't care who owned or operated the facility; we'd just avoid any products that originated there.

HISTORY

When WDJ was first published in 1998, it was virtually impossible to find out anything about pet food manufacturing sites. It took *years* of asking companies to share information about their production facilities before we made any inroads. The approach that finally levered this information out of a few makers of high-end dog foods? “You say you have nothing to hide and that your manufacturing facilities are the best – so, prove it!”

A few companies finally decided they had nothing to lose and everything to gain. Most of the companies that disclosed information about their manufacturing sites, or went so far as to invite us to tour those facilities, were relatively new to the market – and all of them were competing in the most expensive strata of products that are variously called *natural*, *holistic*, and/or *super-premium*.

When the word got out that we had toured a number of dog-food plants and didn't print any photos secretly taken with a camera hidden in our coat buttons or publish detailed accounts of our visits, we

We've toured some very old manufacturing plants and a couple of brand-new ones; we've seen one where (in a clear health violation) birds flew into the facility and grabbed bits of food and one that featured negative air-pressure, to keep even the tiniest flying insects out. Some pet food plants have a fairly pleasant, toasty aroma in the air, and some don't smell good at all. The ownership of the plants – private or co-packer – didn't consistently correlate to either cleanliness and good repair or shabbiness.



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NUTRITION

received more invitations. To date, we've toured more than a dozen dry dog-food plants, three canned-food facilities, two human-food plants that manufacture truly – legally! – human-grade dehydrated diets for dogs, and a handful of raw-food and freeze-dried dog-food manufacturing plants. About half of the facilities we've seen were co-packers.

VALUE OF AWARENESS

Our conclusion about “which is better, self-made, or co-packed?” after seeing all these manufacturing facilities? It depends! The largest self-owned and self-managed facilities tend to have the best quality control and consistent products; they also tend to use less-expensive ingredients and highly conventional formulas. Some of the nicest-looking and

-smelling ingredients we've seen have been getting cooked up at co-packing facilities – some of which were small, old, and not nearly as clean as the bigger plants we've seen.

As so many things having to do with pet food are concerned, it's incumbent on you to find out what sort of manufacturing facility makes your dog's food – call the company and ask! – and to take responsibility for your choice. (It's informative even if the company won't say where its products are made, if you get our drift.) At the very least, if you know where your dog's food is made, and a recall of that brand is announced, you will be a step ahead in knowing whether or not you should stop feeding the food. 🐾

Nancy Kerns is WDJ's editor.

TYPES OF PET-FOOD PRODUCERS, COMPARED

Type of Manufacturing Facility	Potential Benefits (for the consumer)	Potential Drawbacks (for the consumer)
OWNED BY PET-FOOD COMPANY	<p>If there is a problem, the pet food company has full control of any needed investigation and can make potential corrections and/or reparations quickly.</p> <p>The companies who can afford to own and operate their own plants tend to be big, so they have budgets for training and retaining good employees, for improving equipment, and for top-notch quality control.</p> <p>Products tend to be more consistent, and prices of the finished products may be less per pound than similar products made in smaller plants.</p>	<p>The companies who can afford to own and operate their own plants tend to be big, so everything is big: the size of the production runs, the purchasing of ingredients in bulk, the cost of changing formulas (products will need new labels) if a problem is found with a formula . . . It's may be more difficult to trace the source of problems in large lots of raw ingredients and in product that needs to be recalled.</p> <p>“Specialty” ingredients are probably not used by the largest companies since it's difficult to procure large quantities. Formulas tend to be highly conventional and include lower-cost ingredients.</p>
CONTRACT MFR.	<p>If a co-packer isn't doing a good job, a company can take its products elsewhere to rapidly solve the problem.</p> <p>If a new pet food company has an idea for a truly innovative product, they can have small batches (runs) of the product made at a co-packer, testing the response to the product on a small population and scaling up with each success; this helps facilitate the development of innovative formulas.</p> <p>Higher-quality ingredients are easier to procure for smaller batches.</p>	<p>If there is a problem, co-packer may blame it on the formula provided to them, and their client may blame it on them; due to the potential for litigation, neither party may step up to publicly take responsibility. (We've seen this happen a number of times in our 23-year history.)</p> <p>Smaller companies often seem less capable of training and retaining the most qualified employees; quality-control procedures may be inferior to those practiced at larger manufacturing plants.</p>

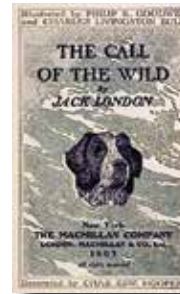


CONSUMER
ALERT

Howling in the Uncanny Valley

How CGI dogs can interfere with our understanding of real dogs and harm the human/animal bond.

He had a way of taking Buck's head roughly between his hands, and resting his own head upon Buck's, of shaking him back and forth, the while calling him ill names that to Buck were love names. Buck knew no greater joy than that rough embrace and the sound of murmured oaths, and at each jerk back and forth it seemed that his heart would be shaken out of his body so great was its ecstasy. And when, released, he sprang to his feet, his mouth laughing, his eyes eloquent, his throat vibrant with unuttered sound, and in that fashion remained without movement, John Thornton would reverently exclaim, "God! You can all but speak!"
– Except from Jack London's 1903 novel, *The Call of the Wild*



There's nothing modern about human beings anthropomorphising animals in stories; some of our earliest spiritual practice is called "animism," and it's common for traditional cultures to assume full agency for plants, stones, and rivers as well as the animals who share their worlds.

Coyote, Anansi, Anubis, kitsune – countless personified beings in ancient narratives and depictions – invert, transgress, and transcend lines between human and animal. Both art and story frequently move between depicting such beings as animals with plausible animal motives and as animal-influenced anthropomorphic figures. Sometimes Coyote appears to be a wild canid on the hunt, sometimes a god, sometimes a bipedal trickster with a bushy tail and a penchant for scatological jokes.

Classical fables attributed to Aesop featured animals conversing across species, displaying both individual character traits and stereotypes of virtue and weakness personified in a species – crafty foxes, greedy monkeys, foolish asses. These morality tales with animal and "animal" characters persisted from antiquity to the modern age.

All these entities coexist comfortably with real animals in the minds of humans who are intimately familiar with the natures of the animals with whom they interact daily and depend upon for life and livelihood. No hunter-gatherer can countenance a big-eyed quadrupedal spotted human toddler called

Bambi. A horse-crazy girl can become an equestrian and read *Black Beauty* without once believing that Ginger and Beauty are actually discussing the bearing rein out in the paddock.

HOW COMPUTER-GENERATED IMAGERY GOES WRONG

But what happens when human beings become increasingly alienated from the natural world and the animals who share it with us, while passively absorbing imagery about them that is a lie?

*Much was made of the fact that 20th Century Studios used a real dog – a rescue! from a shelter! – as a model for the 2020 movie version of *The Call of the Wild*, but the dog in the movie is 100% computer generated imagery (CGI). In our opinion, that rendering of the dog (especially its facial expressions) ruined the movie.*



© 20th Century Studios

Mostly, it is the CGI-Buck's eyes that spoil the movie. They are the eyes of a cartoon human who is thinking human thoughts, experiencing human experiences, living a projected caricature of a human life inside a digitally rendered fur suit.

How likely are we technologically tethered humans to absorb and integrate false information about animal consciousness, lives, emotions, and behavior? False information can prevent us from understanding the ways that nonhuman animals differ from us, and even the genuine (rather than idealized or projected) ways that we are alike. False information also can congeal into unexamined bedrock beliefs that resist science, common sense, and even the testimony of our own eyes – and it's all the more powerful because it was absorbed unconsciously in the course of being entertained by a visually robust and sentimental story.

Given the great imbalance between the time and attention that most of us devote to the natural world around us and what is usurped by screens, it seems reasonable to be concerned about screen visuals interfering with our integration of animal reality. In concrete terms, the fear is that the screen dogs prevent us from understanding and having reasonable expectations of real dogs.

SETTING EXPECTATIONS

Every trainer carps about Lassie expectations and Marley ownership. We roll our eyes at middle-aged people who fear Rottweilers because they first saw them as devil-dogs in *The Omen*. Breed stewards howl when the trailer for some blockbuster reveals one of theirs in a fantasy-scripted role – anticipating a run on Dalmatians or Huskies or Malinois purchased and discarded by fatuous fantasists. What is *new* is the apparent realism that is more visually powerful, and potentially makes a stronger and more persistent unconscious impression, than what the chronic viewer experiences through interactions with flesh-and-blood dogs.



© 20th Century Studios

Straightforward fantasy that crosses a clear threshold doesn't seem to be a large problem, for the very reason that Aesop has not been. Relatively few people beyond the age of reason think that pigs and sheep-dogs and ducks chat in English via CGI-rendered mouth movement.

Humans respond poorly to inanimate things that pretend to be human and almost-but-don't-quite succeed.

If a robot or CGI-rendered character is only vaguely human-contoured, that's generally okay. C3PO and Shrek do not startle and distress us; "RealDolls" and Princess Fiona do, and "The Conductor" in *The Polar Express* definitely does. Motion-capture of actor Andy Serkis to bring life to the degraded creature Gollum, with his spindly limbs and hypertrophied eyes, works in a fantasy context. A Tom Hanks-shaped computer Tom Hanks, not so much.

The space in which a fake human is both too human and not human enough has been named "the uncanny valley."¹ Its contours vary somewhat between individuals, and possibly between cultures and generations, but every person seems to have a set point where we respond, "Oh, h*** no!"

Humans have good emotional detectors for things we perceive as willful imposters, and our instinct is to reject them as up to no good. The perfectly proportioned android or

image may be given away by slightly incorrect movements, or textures, or in the final case, the eyes. It's hard to get the windows of the soul right when there's definitely no soul there.

At least one scientific study found that we also reject imposter animals of familiar species.²

Which is why my guarded excitement at hearing that the actor who is my sexual orientation would be starring in a big-budget movie adaptation of a classic canine-centric adventure novel flipped to a visceral, "Aaaaagh! Harrison Ford, how could you?!" the moment I viewed *The Call of the Wild* movie trailer.

How do the moviemakers not see how *wrong* the CGI-altered Buck is?

20th Century Studios issued an official synopsis, including this astounding claim:

"As a live-action/animation hybrid, *The Call of the Wild* employs cutting-edge visual effects and animation technology in order to render the animals in the film as fully photorealistic and *emotionally authentic* characters" [emphasis ours].

Some of the wrongness that dog-savvy individuals can articulate about the fake, imposter Buck and the other very wrong CGI animals has to do with what we can see about movement – the gait that flows and slinks

in a way that no quadruped does, and the over-long, apparently telescoping neck. The fur is CGI fur, painstakingly rendered, precisely incorrect. However, a casual sampling of acquaintances suggests that people who do not live highly animal-centric lives do not perceive these deficiencies.

But mostly, it is pretender-Buck’s eyes.

They are *not* the eyes of a dog who can almost speak – not the eyes that anyone fortunate to have earned the regard of a discerning canine knows; the eyes of an alien species choosing to connect and converse; eyes that appraise and assess; that love a dog’s love, judge a dog’s judgment, and measure a dog’s reckoning. Instead, they are the eyes of a cartoon human who is thinking human thoughts, experiencing human experiences, living a projected caricature of a human life inside a digitally rendered fur suit.

For the filmmakers, “emotionally authentic” apparently means “a stylized contortion of emotions as experienced by humans and wrought through human facial muscles overlaid on a dog-shaped skull.”

Buck, a flesh-and-blood Saint Bernard-mix that Karen buys online for her kids, will not raise his eyebrows expressively like a cut-rate human actor. He will not telescope his neck to express mild surprise or theatrically grimace with effort. When his pupils dilate dramatically, that’s neither love nor astonishment, but possibly a prelude to employing his large, emphatically nonhuman teeth to defend his rawhide from little Jayden. Buck the \$5,000 hybrid mail-order hero will remain 100% real dog – so much so that he may well find himself behind shelter kennel bars before age 1.

ONE THAT GOT IT RIGHT

This is why I was relieved to see publicity for the new feature produced by Disney – Disney! – that dramatizes a true adventure story and stars real dogs doing real dog things.

Ericson Core, the director of *Togo*, told ET Online:

“Look, in moments of peril or places where you really need to use CGI dogs, of course. But when it’s used as a default, I don’t think it’s as powerful, frankly ... And some of what is natural and human is rough edges. It’s real animals. They’re not always looking at you, they’re not always in exactly the right place, but their heart is there. And we tried very hard in this particular film to ground in the truth. I hope that we made a great movie in all the wonderful Disney traditions of telling a wonderfully beautiful, inspiring story, but did it in a very grounded, truthful way, which will help it resonate for a long time.”

If audiences accept fake Buck as “emotionally authentic” – if the actions and expressions that are actually possible for an animal to perform no longer limit cinematic fantasy, and profoundly animal-ignorant filmmakers are freed from natural limits going forward – consumers of that fiction can anticipate a process of being insidiously conditioned to accept non-animal expression and communication as normal and “real” in a way that supersedes their limited and distracted and often repercussion-free experiences with the living animals.

Of limited consequence when the convincing fake critter is a Bengal



In contrast, Disney’s 2019 movie, Togo, does it just right. Computer-generated imagery was used only to spare real dogs from being put through simulated – but still dangerous – depictions of wintry perils.

tiger, which few moviegoers are likely to encounter in uncontrolled circumstances.

But of great significance when the counterfeited animal is the one that shares their homes, tries her damndest to communicate, yearns to connect in a genuine way, forgives until she can no longer, and cannot but be emotionally authentic. The more inscrutable her valid dog-ness becomes to the humans who control her life, the more tenuous her position – and the more opportunities those humans miss to expand their own repertoire of emotion and sensation and experience through the generous friendship of a complete and alien being. 🐾

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Stressed Out

Why you should care whether your dog is chronically stressed, how you can tell – and what you can do about it.



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Lots of people joke about how they would like to have their dog's life – no job, sleeping all day, having food delivered . . . but the truth is, that life can be very stressful for a dog! Dogs evolved to live in groups, not staying alone all day. Being subjected to our unpredictable schedules, often without so much as the ability to go outside to relieve themselves when they want to, can actually cause a lot of stress in some dogs.

Stress is not specific to humans – it affects all species, including our dogs, and it takes a toll on every living thing that it affects. The growth rate and production of plants decreases when they are stressed by unseasonal weather. Bees sting when they are stressed by threats to their hive. Humans get ulcers, are more susceptible to illness, and are more likely to lash out at other humans (or our pets!) when stressed.

As kindred mammals, the dog's response to stress is very similar to our own: It can make them sick, and it can affect their behavior in ways that no one around them enjoys. It behooves us, as well as our dogs, to recognize the stressors in our shared lives and do our best to minimize them.

WHY STRESS IS BAD

There are two kinds of stress. “Good” stress, known as eustress, can actually enhance our lives (“eu” is Greek for “good”). Eustress is defined as: “The positive cognitive response to stress that is healthy, or gives one a feeling of

fulfillment or other positive feelings.” This is the stress you feel getting ready for a promising date, or waiting to go pick up your new puppy. It's the stress your dog feels when she hears your car turn into the driveway gets happy and excited because you're home after you've been away at work all day. We're not worried about eustress – ours, or our dogs'.

What we're concerned about is the “bad” stress, technically called distress, and defined as: “Psychological discomfort that interferes with your (or your dog's) activities of daily living.” If you've lived with a dog or dogs for any length

of time, you have probably seen some of the signs of their distress (we'll just call it “stress” for the rest of the article). Here are a few you may have seen:

- Tension and trembling on the exam table at the vet hospital
- Hackles raised and growling at the UPS delivery person
- Hiding in the back bedroom when guests are visiting
- Crawling behind the toilet when a thunderstorm hits
- Drooling or foamy mouth at the dog-park

The list could go on for pages, but you get the idea. So why is stress such a bad thing? For starters, a huge percentage of what is perceived as canine “misbehavior” is actually

a dog's response to stress. Eliminate the stress in your dog's world and you might be amazed at how much better behaved she is.

The other significant reason stress is bad is that it affects your dog's physical health. It is well known that anxieties trigger the release of stress hormones – adrenaline, cortisol, and norepinephrine – and chronically increased levels of these hormones can negatively impact the immune system. A compromised immune system makes your dog more susceptible to a variety of infectious diseases as well as serious long-term health issues, including cancer. A 2016 study suggests that dogs who are diagnosed with cancer are significantly more likely to have lived in stressful environments than those who are cancer-free.¹

CAUSES OF STRESS

There's no end to the things that *can* stress your dog – but some are more common than others. Life with humans can challenge dogs in a number of common ways, including:

■ **Change.** Life changes are stressful for all of us. For your dog, this can be something as small as a change in routine (such as when daylight savings time changes mealtimes) or as significant as the loss of a human or canine companion. Moving is another big stressor that often results in unwanted canine behavioral changes (although a move that removes stressors can be a good thing!).

■ **Presence of an aversive stimulus.** An aversive stimulus is defined as “an unpleasant stimulus that induces changes in behavior.” If your dog doesn't like or is afraid of other dogs (or men, or children, etc.), the presence of another dog (men, children) is an aversive stimulus. If your dog is sound-sensitive, thunder, fireworks, a pan dropping on the floor or even the “ding” from a microwave oven could be aversive stimuli. The greater the intensity of an aversive stimulus – more dogs, dog(s) closer in proximity, louder volume of sound, repetition of the sound, etc., the more stressful it is to your dog.

■ **Forced restraint.** Many dogs prefer not to be restrained – and some find it very stressful. Forced restraint most often occurs during husbandry procedures – veterinary visits, grooming, nail trimming, etc. The shift toward cooperative care in the veterinary, grooming, and training communities is a change that will be appreciated by many dogs (and their humans). (See “Fear Free Veterinary Care,” WDJ August 2019, and “Fear Free Vet Visits,” December 2015.)

■ **Force-based training.** By definition, force-based training involves the use of techniques that are aversive to the dog – usually both verbal and physical force and coercion. These are significant stressors for dogs, and studies support the position that dogs trained with

these methods are considerably more stressed and exhibit more problem behaviors than dogs trained with force-free methods.²

■ **Medical conditions.** Whether illness or pain (chronic or acute), medical issues are extremely significant stressors. This is why it's critically important to rule out or identify and treat medical issues as soon as possible in a behavior modification program. You are likely to still have to do behavior modification after the condition is treated or managed, but your likelihood of success is greatly enhanced when you remove the medical stressor.

■ **Owner stress.** We have long known that dogs are very aware of their humans' emotional states. A recent study supports our also long-held belief that dogs mirror their owners' stress levels. If you are stressed, you are stressing your own dog, so mitigating your own stress can be beneficial to your dog as well as to you!³

This is by no means a complete list of stressors. It will behoove you – and your dog – for you to sit down and make as complete a list as you can of your dog's own personal stressors, so that you can begin to address them and help you and your dog have a better life together. (See “Reducing Your Dog's Stress,” page 15.)

SIGNS OF CANINE STRESS

If you are not fluent in canine communication, it's time to study the language so you can better understand your dog and be prepared to help her when she needs it the most. Here are some of the common signs you might see that tell you your dog is stressed:

■ **Aggression.** With one very rare exception (idiopathic aggression), aggression is caused by stress. The best thing you can do for aggressive behavior is reduce stress. The worst thing you can do is punish the dog, which merely adds stress to your

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already stressed dog. (See “Good Growling,” December 2016.)

■ **Vocalization.** Dogs vocalize for a long list of reasons. Vocalization is normal canine self-expression, but it may intensify under duress. Dogs who are afraid or tense may whine or bark to get your attention or to self-soothe.

Dogs with separation anxiety may bark or scream for hours. Your dog may howl to express her unhappiness, or because the fire truck is going by with sirens blaring. When your dog vocalizes, check to determine the trigger. If it’s from stress, it needs to be addressed to mitigate her emotional distress, whatever the cause. (See “Oh Shush,” March 2017.)

■ **Destructive behavior.** Left unsupervised, puppies can wreak havoc on a home in almost no time. That’s often just normal puppy behavior. When an adult dog is destructive, we tend to think she’s being a “bad dog.” In many cases, however, she’s destroying things because she’s in a stress-related panic. Reduce her stress, and you’re likely to see a significant behavior change.

■ **Unusual elimination.** Just as with anxious humans, nervous dogs can feel a sudden urge to go to the bathroom. House-soiling in an otherwise well housetrained dog is a big red stress-flag. Marking (especially indoor marking) is commonly a function of stress rather than a housetraining issue. Diarrhea can be a sign of stress, and the sudden release of bladder and/or bowels can also indicate significant stress. (These can also be medical issues, so be sure to discuss with your veterinarian.)

■ **Not eating/losing weight.** If your dog turns up her nose at your high-value treats during a counter-conditioning session, she is probably stressed because the aversive stimulus (the thing you are trying to change her response to) is too close or otherwise too intense. Move farther away or otherwise reduce the intensity of the stimulus (by decreasing its volume or

movement, as appropriate). If a dog with an otherwise good appetite isn’t eating well, consider illness first and consult your vet, but don’t rule out generalized stress.

■ **Avoidance, escape, and displacement behaviors.** When faced with an unwelcome situation, your dog may “escape” by focusing on something else. She may sniff the ground, lick her genitals, suddenly start scratching an itch, avoid eye contact, or simply turn away. If your dog avoids interaction with other dogs or people, don’t force the issue. Respect her choice.

Some dogs will move behind their human to hide – an extension of avoidance. Other escape behaviors include displacement activities such as moving/running away, digging or circling, or hiding behind a tree or parked car.

■ **Hypervigilance.** The dog who can’t seem to settle, is always on alert, reacting to every noise or change in the environment, is very likely a stressed dog. This behavior is common with dogs who are identified as having generalized anxiety disorder – they rarely or never relax.

■ **Stressed body language.** There are a multitude of ways that dogs tell us they are stressed, with their eyes, ears, tails, faces, mouths, and body posture. In fact, your dog is talking to you all the time; be sure to “listen” with your eyes. (See “Listen by Looking,” August 2011, and “About Face,” March 2013)

■ **Comfort-seeking.** Your stressed dog may seek you out for comfort and reassurance. Contrary to an unfortunate popular myth, it is okay – no, it is good – to calmly comfort and reassure your stressed dog. A stressed, frightened dog may also tremble – again, provide calm comfort and reassurance.

■ **Yawning, drooling, licking, scratching.** Of course, dogs yawn when they are tired or bored, just like

we do. They also yawn when stressed, just like we do. A stressful yawn is more prolonged and intense than a sleepy yawn. Dogs may also drool, lick, and scratch excessively when nervous. Again, rule out medical conditions and fleas when you see these, but also consider stress.

■ **Excessive shedding.** It’s normal for dogs to shed a lot in the spring and fall, getting rid of their old coats to prepare for the new season. Some dogs also normally shed year-round – Labrador Retrievers and Huskies (and several other breeds) are notorious for this. However, shedding can also increase when a dog is anxious, so watch for this type of shedding as a stress indicator.

■ **Panting.** Panting when hot, excited or having just exercised is, of course, normal. If, however, your dog is panting absent those conditions, it is quite likely due to stress.

HELP YOUR DOG BECOME HAPPIER AND HEALTHIER

This is not a complete list of all the signs exhibited by dogs who are stressed. Your dog may display some of the stress signs listed above or others. Take time to observe her and identify her particular signs of stress so you can recognize them and help her when she is stressed.

Most importantly, remember that when your dog is behaving inappropriately it is most often because she is stressed and cannot help it, not because she wants to misbehave. One of my new favorite aphorisms is, “Your dog isn’t *giving* you a hard time, she’s *having* a hard time.” Remember this, and help her times get better. 🐾

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Reducing Your Dog's Stress

Clearly, one of the best ways to help your dog have a better quality of life is to reduce the amount of stress she experiences. The first step is to make as complete a list as possible of everything that is stressful for her. This includes mild stressors as well as the significant ones. Stressors stack up like building blocks to push your dog beyond her ability to cope with her environment; eliminating even the milder ones can help keep her below that threshold. Here are five strategies for reducing stress:

1 Classical counter-conditioning. This involves changing your dog's association with the thing she finds aversive by associating it with something wonderful (such as delicious bits of roasted chicken).

This is a slow process and you must be sure to keep the intensity of the stimulus below threshold – so the dog sees it (or hears it) and is aware of it but isn't stressed. Your goal is to convince her that other dogs (children, men, sounds) are wonderful because they make bits of chicken appear. It is *not* about reinforcing a desired behavior; her calm behavior doesn't make the chicken appear, the presence of the aversive stimulus does. (See "Fear Not," December 2018.)

2 Operant conditioning. This involves reinforcing desirable behaviors. You can use this in a couple of different ways. If you teach your dog to adore a certain behavior (or behaviors) such as "Touch," "Find It" (See Find It, March 2015) and "Walk Away," (See How to Teach Your Dog to Just Walk Away, August 2018) you can use her very positive association with those behaviors to put/keep her brain in a happy place even in the presence of a stressor. As with counter-conditioning, this works best if you can start with a low-intensity stimulus.

Alternatively, you can use the Constructional Aggression Treatment (CAT) procedure to teach your dog that calm, relaxed behavior will make the bad thing (aversive stimulus) go away. As she deliberately offers calm relaxed behavior, she will become calm and relaxed about the presence of the aversive, and no longer feel the need to make it go away. This is a complex procedure, and if you choose to use it you will likely need the assistance of a qualified force-free professional.

Many cooperative-care procedures involve operant conditioning, including the Bucket Game (see "Training a Dog to Make Choices," November 2016), a "chin rest" (see "How to Properly Examine Your Dog," March 2014), and teaching her to file her own nails (see "Force-Free Nail Trimming Techniques for Your Dog," August 2012).

3 Management. It's a perfectly acceptable way to reduce your dog's stress. Medication is one way to manage stress, and I highly recommend it for dogs who need it – sooner rather than later. If your veterinarian is not knowledgeable about the medications commonly used for behavior issues, ask her to do a phone consult with a veterinary behaviorist to determine the appropriate medication for your dog. (Most vets, well intentioned as they are, are not up to speed on the complexities of behavioral medicine.)

Another way to manage is to simply prevent your dog's exposure to the stressor. If she's afraid of children, don't allow children near her. (Obviously this only works long-term if you don't have children and don't have frequent child visitors.) In some cases, management is a perfectly acceptable long-term solution. In other cases, it's a mandatory short-term solution while you work to implement other stress-reduction strategies.

4 Elimination. This means getting rid of the stressor altogether. Forever. Stop yelling at your dog. Throw the shock collar in the garbage. Teach her cooperative care so there is no need/excuse for forced restraint (and seek out force-free professionals so you don't have to fight battles about not using force). Don't allow inappropriate interactions from any friends, visitors, or family members.

5 Live with it. We all have stress in our lives and can't make it all go away. Some stressors in your dog's world may not be significant enough to cause problems, aren't worth investments of time and energy into behavior modification, and are difficult to manage or eliminate. Maybe your dog is slightly stressed if your cat occasionally swats at her nose, but they are otherwise compatible. Perhaps your dog exits the kitchen if pans clank, but otherwise seems unaffected. While keeping in mind that every stressor moves her at least slightly closer to threshold, it's okay to decide that she may just have to live with some of the lesser ones.



Counter-conditioning and desensitization is one of the best ways (but not the only way) to change your dog's association with a stressor. Remember to think crockpot, not microwave!



Wildlife Protection Dogs

Biologists and conservation workers are increasingly turning to sniffer dogs for help in locating endangered animals for study – and hunting poachers who harm threatened species.



Some of the dogs trained and deployed by Working Dogs for Conservation are used to combat poaching of threatened and endangered species. One of the organization's dogs, Radar, a Belgian Malinois, is shown here tracking a suspected poacher in the Grumeti Game Reserve, adjacent to the Serengeti National Park in Tanzania. Photo by Richie Graham, courtesy of WD4C.

We don't usually think of dogs as the best friends of elephants, whales, hedgehogs, Chinese Moon Bears, bandicoots, or white-footed voles, but their incredible noses make a difference in the lives of these and other endangered species. Dogs are increasingly being put to work as valuable tools to both protect endangered species and combat *invasive* species that can destroy habitat for native plants and animals. We hope that when you read about some of the amazing things they can do, you will be inspired to put your dog's nose to work – if not for conservation, at least just to give your dog an engaging activity that provides a great workout for body *and* brain.

■ **Preventing elephant poaching.** From 2010 through 2012, poachers killed an average of 33,630 elephants every year, resulting in more than 100,000 deaths across the continent, according to the International Union for Conservation of Nature. However, thanks in part to U.S. Army software and sniffer dogs, Kenya has significantly reduced

the number of animals killed in that country since 2013.

According to its Canines for Conservation Program, the African Wildlife Foundation combats illegal wildlife trade by placing ivory detection dogs and their handlers at key airports and seaports throughout the continent. By detecting tiny amounts of ivory or rhinoceros horn dust, officials can prevent traffickers from exporting wildlife contraband. The dogs are also trained to find guns, which, because they are difficult to obtain, are typically used by multiple poachers. In his first week of field work, Ruger, a mixed-breed dog working with the Department of National Parks and Wildlife in Zambia, found 13 guns, putting an estimated 150 poachers out of business.

■ **Detecting wildlife products.** In India, German Shepherd Dogs are used to detect products such as tiger skins, ivory tusks, and the bones of endangered birds. They are also trained to locate injured animals, which helps authorities arrest poachers quickly. The program, which is jointly conducted by the World Wildlife Fund and a wildlife trade-monitoring network, plans to train more dogs to decrease animal poaching across the country.

■ **Rescuing Australia's koalas.** In Australia, where brush fires burning since September 2019 have ravaged the continent and killed more than a billion animals, dogs are saving koalas. Detection dogs are trained to identify koala fur, whose scent falls from trees in which koalas reside. When high winds, heat, and other conditions interfere, the dogs search for koala scat to identify where the animals have been so that human experts can scan the appropriate trees and find them.

Some koala-sniffing dogs have become

celebrities in their own right, such as Bear, a detection dog from the University of the Sunshine Coast in Queensland, Australia. Bear and his handler made several television appearances explaining how the koalas Bear finds are given health checks, medical treatment as needed, and are released into the wild wearing GPS collars that allow researchers to keep track of them. Bear's obsession is any toy that anyone will throw for him, so once he became familiar with the scent of koalas, his chase-the-toy rewards arrived whenever he successfully indicated a "find."

■ **Helping bandicoot populations recover.** Five years ago, the Werribee Zoo in Victoria, Australia, raised funds to train livestock guardian dogs (LGDs) to protect the endangered eastern barred bandicoot from predators. The bandicoots, which are small, shy, solitary, nocturnal marsupials, were extinct in the wild but could be found in public zoos across Australia and were being released in selected locations to re-establish their populations. Previous attempts to release bandicoots into the wild failed as the animals fell victim to foxes and cats.

Maremma LGD dogs are a livestock breed native to Italy, and they can be trained to chase predators away while maintaining a respectful distance from the animals they protect. Before being introduced to bandicoots, Maremma LGDs successfully protected colonies of penguins.

■ **Tracking whales by their poop.** On the opposite side of the world, off the coast of San Juan Island, Washington, a black Lab-mix named Tucker leaned over the bow of the research vessel *Moja* and sniffed the air. His goal? Finding orca whale scat, which he could detect in open water up to a mile away and in the tiniest of pieces.

Because scat can sink or disperse in less than half an hour, finding it isn't easy. But it's worth the effort because examining their fecal matter helps researchers study the 85 orcas,

Working Dogs for Conservation

Headquartered in Missoula, Montana, Working Dogs for Conservation calls itself the world's leading conservation detection dog organization. Its website (WD4C.org) describes its mission: "Building upon techniques from narcotics detection, cadaver detection, and search and rescue, we pioneered ways to use dogs' extraordinary sense of smell to protect wildlife and wild places. Our dogs can detect weeds before they break the surface, animals that live below ground, and aquatic organisms invisible to the human eye. Our co-founders were the first to train dogs to detect wide-ranging carnivores non-invasively, to uncover illegal snares in Africa, and to find invasive plants, insects, and fish."

In 2013, the *San Jose Mercury News* interviewed Megan Parker, the organization's Director of Research, about Pepin, her Belgian Malinois. Pepin was trained to track the poop or scat of endangered wildlife. "Scat is a gold mine of information," Parker explained. From scat, scientists can extract DNA to check the sex of animals, discover family relationships, evaluate diets, test hormone levels, check for diseases, and map an animal's home range. This information helps conservationists monitor endangered animals without having to trap, tag, or hunt them. Pepin tracked endangered fox kits in California and endangered gorillas in Cameroon (to name just a few) by their scat.

All of the organization's dogs live with their handlers, train at least twice a week, and are rewarded with favorite toys. Most of them were adopted from shelters, where, typically, they displayed such high energy and hyper-focus on toys and play that they were found to be unadoptable by most members of the public. WD4C describes their candidates this way: "Great conservation detection dogs have an obsessive play drive and an unrelenting toy focus. Their never-quit attitude makes them nearly impossible to keep in a family home, but perfect members of the WD4C family."

WD4C feels so strongly that the best candidates for conservation work are often found in shelters, that it created a program, Rescues 2the Rescue, through which they teach shelter staff how to identify dogs that would make ideal candidates for this work and to connect them with organizations that could adopt and employ them. WD4C says its next step is to create ways for working dog organizations to evaluate candidate dogs, "so that more of these talented, at-risk animals can be placed in successful, fulfilling careers."



If you would like to support the work of WD4C, or are interested in developing a conservation dog project, WD4C can advise on performance, husbandry,

training issues, troubleshooting, novel scents or techniques, or help with any other aspect of conservation dog work; the group supports others and the field. See WD4C.org for more information.

UW's Center for Conservation Biology

For decades, conservation biology has been a field of study at the University of Washington in Seattle, and since 1997, dogs have played a key role in the department's research. That's when Dr. Samuel Wasser, Director of the Center for Conservation Biology and Conservation Canines, began using dogs to help find threatened and endangered species. He and Sgt. Barbara Davenport, Master Canine Trainer with the Washington State Department of Corrections, adapted dog-training methods used to train narcotics- and arson-detecting dogs to help dogs locate the scat, or feces, of endangered animals around the world.

Scat is important in wildlife research because it offers genetic, physiological, toxicological, and dietary indicators of species abundance, distribution, resource use, physical health, and response to environmental pressures. Scat-detection dogs routinely out-perform traditional wildlife detection methods such as the use of remote cameras, radio-collaring, hair snags, and trapping.

Scat-detection dogs are selected for their trainability, temperament, play drive, and strong object orientation. They are intensely focused and have an insatiable urge to play. Their obsessive personalities are incompatible with most families, so they are often given up for adoption, but their single-minded drive makes them perfect for conservation work. The Conservation Canines website says its dogs "are happy to work all day traversing plains, climbing up mountains, clambering over rocks and fallen trees, and trekking through snow, all with the expectation of reward – playing with their ball – after successfully locating wildlife scat. We rescue these dogs and offer them a satisfying career traveling the world to help save numerous other species."

For information about contracting for the Center's services, or to contribute to its Friends of Biology Fund, visit conservationbiology.uw.edu/conservation-canines.



Tucker, a Labrador-mix, was one of the first (and most successful) conservation dogs to search for whale scat on the open ocean. To see a video about him made by The New York Times, go to tinyurl.com/WDJ-Tucker-at-work.

project, "my immediate response was, 'We'll take her.'"

Professor Wasser is the lead author of a study on the challenges facing today's orcas. "A lot of whales are getting pregnant, but they are losing a large portion of their pregnancies," he explained. "They don't have enough food." The orcas feed primarily on Chinook salmon, and with declines in the Chinook population, their food supply is shrinking. Dr. Wasser said that when Tucker retired, an Australian Cattle Dog named Jack took his place, but with overfished salmon and fewer whale sightings, Jack may not be as busy as Tucker was.

or killer whales, that live just north of Seattle. The orcas have been tracked for decades, and their declining numbers concern scientists.

Unlike other detection dogs, Tucker couldn't just approach his target and sit to signal a find. He had to guide the boat to the right area, then wait while researchers noticed and retrieved the material.

Today there are several scat-detection dogs in the Conservation Canine program at the University of Washington's Center for Conservation Biology, but Tucker holds a special place in the program's history. When he retired at age 13 in 2017, Tucker

had helped find the majority of the 348 fecal samples analyzed in the orca research project.

Like the trainers of other scent-detecting dogs around the world, those who work with conservation dogs look for dogs with drive and focus. A Flat-Coated Retriever named Sadie was donated to the program because of her ball addiction. In frustration, her owner put Sadie's ball on top of the refrigerator, and eight hours later Sadie was still sitting there, staring at the ball. "When the owner told me that story," said biology professor Sam Wasser, Ph.D., director of the orca scat research

■ Finding tiny animals for research.

Laura Finley is a U.S. Fish and Wildlife Service biologist involved with fishers, which belong to the weasel family. In northern California, researchers used to catch fishers, anesthetize them, punch holes in their ears to hold tags, and draw blood – and then repeatedly recapture them to monitor their population and area.

There's an easier way, as a University of Washington team demonstrated when they worked with two dogs for six weeks and found 700 fisher scat samples, more than the wildlife service could analyze.

A more mysterious target is the white-footed vole, a rodent so difficult to find that it is almost mythical. Native to redwood forests in Northern California and parts of Oregon, the vole looks like a mouse but has a rounder head and stouter body. This small rodent is believed to spend part of its life in trees and another part in burrows in the ground.

To help scientists find and study white-footed voles, researchers experimented with different detection methods, including pitfall traps and trail cameras. Detection dogs may be the most promising method. Wicket, a detection dog with Working Dogs for Conservation, tracked invasive snails in Hawaii, elephants in Africa, grizzly and black bears in Canada, rare Moon Bears in China, and invasive Chinese Bush Clover in Iowa. Researchers hope that Wicket and dogs like her will help them understand the voles' place in the redwood ecosystem, in the food chain, and in a slowly changing habitat.

Frehley, a Border Collie rescued by Conservation Canines from the Seattle Animal Shelter in 2005, learned to track New Mexico's endangered Jemez Mountains salamander by studying its scat and part of a broken-off salamander tail.

Hedgehogs are small mammals that thrive in hedges and underbrush, where they search for insects. Despite their porcupine-like appearance, hedgehogs have thousands of soft, smooth spines and are safe for humans to handle. In England, where hedgehog populations are in sharp decline, conservation organizations offer advice and assistance to those who have backyard hedgehogs, keep hedgehogs as pets, would like to encourage them in their yards, or want to help injured hedgehogs.

In August 2019, the *London Daily Mail* reported that Henry, a three-year-old Springer Spaniel, had been trained to detect hidden hedgehogs as far as 250 yards away. Henry indicates his finds by sitting, and then his handler comes to investigate. Henry helps rescue hedgehogs threatened by land development projects. Because

they live in dense undergrowth and long grass, hedgehogs are in danger wherever land is cleared. The hedgehog project, which will run until May 2020, is overseen by staff at Hartpury University in Gloucester. If the trial is successful, other dogs will be trained to aid hedgehog conservation.

■ Detecting invasive species.

Conservation dogs do more than track endangered species. They help identify and prevent the spread of invasive species, both plants and animals.

- According to Darren Ward, Ph.D., who studies ants at the University of Auckland, New Zealand, sniffer dogs have been trained to assist with eradication programs of non-native red fire ants in Australia and Taiwan, electric ants in Australia, and small colonies of Argentine ants in New Zealand.

- In 2013, the conehead termite began to cause serious damage in Dania Beach, Florida. The Florida Department of Agriculture worried that it could spread throughout the state the way the Formosan termite has spread along the south Florida coast. Because this termite travels above ground, it can spread faster than other species while eluding standard pest-control methods. Connie, a mixed-breed dog adopted from a shelter, was selected for her youth, energy, and long legs, which help her work in tall grass. The nests Connie discovered were removed, packed in garbage bags, and burned or fumigated. So far, the termite is under control.

- In the northern United States and Canada, the zebra mussel has invaded lakes, rivers, and wetlands, clogging water intake pipes, cutting swimmers' feet, disrupting the natural ecosystem, and harming native fish and wildlife. Minnesota's Department of Natural Resources was one of the first to use sniffer dogs to find these invasive animals. Human inspectors searching boats being hauled into and out of Minnesota lakes often missed zebra mussels, allowing them to multiply

and become even more of a nuisance. In 2013, the DNR added three mussel-detecting dogs to its team of more than 140 human inspectors.

"The dogs are going to be able to inspect watercraft and vessels a lot faster than humans," said Travis Muyres, one of the conservation dog handlers. "A lot of the time they're more successful because they're using their noses instead of their eyes."

In Canada, concern about zebra and quagga mussels has made inspections mandatory for any watercraft, from stand-up paddleboards to motorboats. Alberta's inspection crews now include three mussel-sniffing dogs.

- In Kosciuszko National Park in Australia, a pretty perennial threatens agriculture and the environment. The orange hawkweed (*Hieracium aurantiacum*), native to Europe and a member of the daisy family, grows in remote alpine areas close to the ground with leaves in a flat circular pattern. Because of its attractive flowers, hawkweed was sold as an ornamental plant in New South Wales, but when it became naturalized and was recognized as a danger to native species, conservationists focused on eradicating the plant. To help human inspectors find and destroy the plants, two "botanist puppies" are on the job.

In 2016, weed management officer and dog handler Hillary Cherry explained the project to ABC News in Australia. "The dogs can differentiate one plant from another," she said. "We were doing an evaluation the other day and running through dense scrub and one of the dogs turned quickly, ran back, put her nose underneath a big, thick patch of scrub, and found a patch of hawkweed seedlings. We never would have been able to find them. The dogs' ability is so strong and powerful, it blows us away every time." 🐾

Montana resident CJ Puotinen is the author of The Encyclopedia of Natural Pet Care and other books. See "Resources," page 24, for book information.



HEALTH

Pain's Effect on Behavior

Even veterinarians often fail to consider pain as a potential reason for a dog to display unwanted behavior such as aggression and anxiety.

Behavior problems such as anxiety or aggression are commonly diagnosed in pet dogs, and, as many dog owners have discovered, can be quite challenging to fully resolve. Daniel Mills, FRCVS, a veterinary researcher and behaviorist at the University of Lincoln (England), suggests that a large portion of behavior problems are exacerbated or caused by physical pain, and that resolution of that pain can mitigate or even resolve the behavioral issue. Almost 80% of the behavior problems in his own practice, says Dr. Mills, have a component of diagnosed or suspected pain.

Dr. Mills is passionate about raising awareness of the importance of recognizing and treating pain in behavior cases – so much so that he has collaborated with other researchers and behaviorists to publish a framework for thinking about these cases, along with a case series of examples from his and others' practices.

Mills describes a number of cases sharing a recurring theme: The initial veterinary consult reports the physical exam, blood work, and possibly even radiographs as “unremarkable.” Yet a subsequent exam with a veterinarian considering pain as a possible cause turns up something suggestive – perhaps an awkward gait, an uneven weight distribution suggesting the dog is shifting weight off one leg, or the owner reveals under more pointed questioning that the dog has been reluctant to go for walks recently. Often, an old injury that was thought to be resolved is mentioned. Further testing finds a likely cause of pain – or, sometimes, not. But either way, a trial of analgesics results in return to normal behavior.

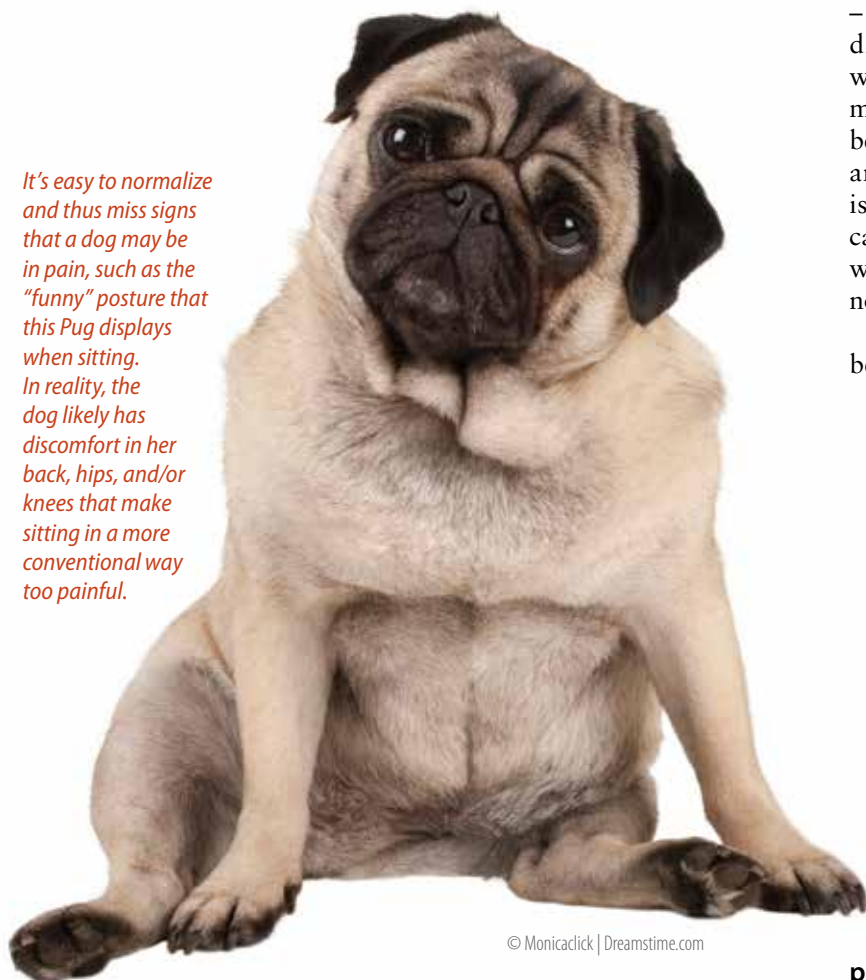
Mills' framework divides pain-related behavior cases into four categories:

- Unwanted behavior directly caused by pain.
- Pain causing secondary behavioral issues in addition to existing ones.
- Unwanted behavior exacerbated by pain.
- Behaviors that may not be problematic to owners, but are actually signs of pain.

Let's look at each of these categories in turn.

■ Unwanted behavior caused by pain. Veterinarians are trained to recognize

It's easy to normalize and thus miss signs that a dog may be in pain, such as the “funny” posture that this Pug displays when sitting. In reality, the dog likely has discomfort in her back, hips, and/or knees that make sitting in a more conventional way too painful.



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Small dogs who snarl and snap when they anticipate being picked up are often labeled as being “brats” or “spoiled” when they are actually suffering from undiagnosed spinal pain. Often the behavior will vanish or vastly reduce in frequency and intensity after the dog receives medication for pain.



certain behavior changes as indicative of pain, such as decreases in normal activity, licking the affected area, changes in gait, repeated shifting of weight while standing, and the most obvious of all, a flinch or yelp when the area is touched.

Vets are less likely, however, to recognize some of the more unusual manifestations of pain, such as star gazing (staring at the ceiling or sky) or compulsive disorders, which can be indicative of gastrointestinal [GI] distress; pica (compulsive eating of non-food objects), which may be related to musculoskeletal pain in addition to the more obvious GI link; hypersensitivity to heat or cold; increased clinginess and seeking of attention from the owner; as well as behaviors more commonly considered problematic, such as fear, anxiety, aggression, resource guarding, or destruction of household items when left alone.

In fact, differences between presentations of aggression can point veterinarians to suspicion of a pain component. In the cases described by Dr. Mills, dogs with pain-based aggression are often described as Jekyll and Hyde-like, with unexpected and sudden behavior changes. Pain-based aggression appears to occur more commonly when dogs are approached by a person, particularly when they are lying down. These dogs are more likely to bite a limb than any other part of the body, and their aggression is briefer and easier to interrupt.

Behavioral changes caused by pain may be more subtle than outright aggression. Dogs performing at a high level in work or sports may begin to show degraded performance that doesn't have a clear cause, but resolves when pain is identified and addressed.

While pain may certainly prevent a dog from reaching his full athletic potential, it can also have more psychological effects, such as making learning more difficult. The dog may appear to be less able to absorb training; imagine trying to listen to a challenging lecture with a splitting headache.

■ **Pain causing secondary behavioral issues in addition to existing ones.** Behavior cases can be quite complex, and full resolution is not always reached. The owner may feel that they have hit a wall and that progress has stopped; relapses are common and frustrating. In some cases, those final steps may be elusive because of an unrecognized pain component.

Initially, picking apart which behaviors are due to pain and which are due to other triggers may be nearly impossible. However, as some unwanted behaviors are resolved through treatment of a behavioral diagnosis, while others begin to appear intractable, the relevance of pain may be revealed.

In one such case, a Border Collie with separation anxiety was destructive when left alone, digging

through carpet and door frames. While his anxiety appeared to improve with anti-anxiety medication and behavioral modification, his digging did not. Pain in a hind leg, redirected to nearly compulsive digging with his front legs, was resolved with medication, and the digging stopped.

In this case, the digging initially appeared to be part of the dog's separation anxiety, and as a result, difficulty in resolving the digging was initially assumed to indicate that the anxiety had not resolved. In fact, the two problems were separate.

■ **Unwanted behavior exacerbated by pain.** In more straightforward cases, pain does not actually cause unwanted behavior, but instead worsens existing behavior problems.

The relationship between pain and behavior is bidirectional; stress in the form of frustration, fear, or anxiety can cause a negative outlook that increases the perception of pain, while pain can itself increase stress. In fact, tensing from anxiety can directly exacerbate musculoskeletal pain. Who hasn't snapped at a co-worker or spouse when dealing with a headache or other chronic pain?

These cases will often present

with behavior that appears out of proportion to its cause. An animal's responses may be excessively intense, or the dog may generalize more quickly and widely than otherwise expected.

For example, a noise-sensitive dog may be startled by a loud noise in one location and then rapidly generalize to avoiding a wide area (perhaps even miles) around the original source. Such over-generalization may provide a hint that there's more going on than simply a learned association with the original startle resulting in sound sensitivity.

Impressive reduction of reactivity may be achieved in such cases with regular pain medication or other measures to reduce pain, like appropriate physiotherapy, even if the root of the anxiety remains.

■ Behaviors that may not be problematic to owners but that indicate pain. As we care for animals who cannot verbalize their inner states to us, it is incumbent on us to be alert to signs of pain, even when those signs do not present a problem for us.

It is easy for us to normalize behavior that is in fact not healthy, such as the labored breathing of a flat-faced dog, repetitive scratching of the neck which might suggest syringomyelia (a cyst within the spinal cord), head shaking indicative of an ear infection, or just an unusual sitting position in a dog who cannot hold his legs or back normally, perhaps secondary to obesity or a spinal malformation.

ADVOCATING FOR YOUR DOG

Veterinarians may not be alert to these multi-factorial problems. Indeed, Dr. Mills confides that despite being an established veterinary behavior expert and leading academic in the field, he still struggles to convince some vets (those in general practice and also specialists in relevant disciplines like orthopedics) about the significance of this issue. Presented with a behavioral issue, they may reach for a behavioral solution. While

Pay attention if your formerly keen dog begins to balk!

a veterinarian may consider pain, given a normal physical exam and other testing, he may not pursue a trial of analgesics or even more conservative pain management measures. Addressing pain is often seen as an avenue of last resort, when nothing else resolves the primary problem. Mills argues that pain should be addressed first, not last.

Moreover, if pain is a reasonable possibility but no cause is apparent on physical exam or testing, Mills typically recommends a trial course of analgesics. Many documented behavior cases have shown significant improvements or even resolution when treated with pain medication.

If the first analgesia trial does not provide results, it is appropriate to try another type of analgesic with a different mechanism of action, in case the first was not right for that dog's particular issue. Mills argues that the risk of side effects can be minimized and that the benefits of using pain medication will normally outweigh the risks, but it is important that any trial is done under veterinary supervision as over-the-counter medications for humans can be quite toxic to dogs.

TAKE THE LEAD

If you suspect your dog may have a behavioral issue rooted in or exacerbated by pain, advocate for her. Encourage your veterinarian to investigate possible causes of pain. Suggest trialing a course of analgesics, and keep a diary to report behavioral changes.

If your veterinarian does not feel such an approach is appropriate in general, emphasize that your dog's behavior is not normal for her. You may need to do some of your own detective work to present some possi-



ble causes to your veterinarian. Mills' paper is open access, so you can give a copy to your veterinarian (see link below).

If you do find that you're dealing with a case of pain-related behavior, encourage your veterinarian to contact Mills. His work is ongoing, and he hopes that he can bring veterinary behaviorists together with the wider veterinary community to build momentum on recognizing the importance of identifying and treating pain in behavior cases. He continues to collect case histories for this work.

Mills notes, "Dogs work incredibly hard to fit in, and if they don't, we need to ask why." As a society, we are lucky to have access to incredibly effective pain medication – don't hesitate to consider its use under veterinary guidance when you think your dog might need it. 🐾

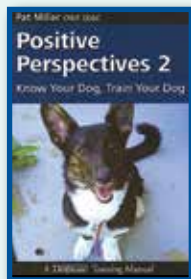
Jessica Hekmam, DVM, Ph.D., is a researcher at the Karlsson Lab at the Eli and Edythe L. Broad Institute of MIT and Harvard, studying the genetics of canine behavior. She also teaches online webinars and courses about canine genetics. Dr. Hekmam lives with her husband and two dogs, with whom she participates in agility and canine parkour. On April 16, Dr. Hekmam will be presenting a webinar on the use of probiotics in dogs for behavior change. See "Resources," page 24 for webinar details.

REFERENCES

"Pain and problem behaviour in cats and dogs" (Mills et al., 2020) was published in the open access journal *Animals*. You can read it for free at mdpi.com/2076-2615/10/2/318.

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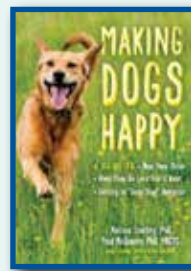
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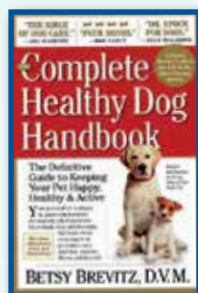
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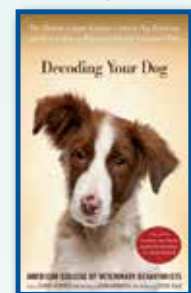
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