

But Why: A Podcast for Curious Kids

Why Do Cats Purr?

May 12, 2017

[Jane] This is *But Why: A Podcast for Curious Kids* from Vermont Public Radio.

I'm Jane Lindholm. We take questions on this show from kids like you and find interesting people to answer them.

I'll tell you how to send your own question at the end of the episode.

OK. They're covered in fur. They live in our houses. Sometimes they sleep in our beds and yet in a lot of ways they're pretty much wild animals. What do you think I'm talking about? That's right, cats.

Lots of you have questions about these enigmatic creatures with whiskers. That word enigmatic, it means mysterious by the way. So we thought we'd go right to the source to get some answers for your questions.

So Clooney, here's a question from Jack.

[Jack] How do cats purr?

[Jane] Schoomp, could you translate that for me?

All right, that's not going to work. Let's get a human who can actually answer.

[Abigail] My name is Abigail Tucker and I've recently written a book called *The Lion in the Living Room*, about humanity's long strange history with house cats.

[Jane] Wow! Lions in our living rooms. Think about it. The cat that curls up in your lap is related to a lion shaking its mane on the savannah in Kenya, but somewhere along their evolutionary path some wild cats decided that life was better near humans.

Now if you want to know more about evolution, go back to our previous episode. The one we just did all about human evolution and you'll better understand how different species are related but have evolved into different kinds of animals.

Most domesticated animals, farm animals like cows and pigs, and pets like dogs, have brains and bodies that have evolved or changed over time to make them look and act differently from their wild cousins.

But Abigail Tucker says that's not the case with cats.

[Abigail] That's because their domestication story is a little bit different. A lot of times with animals that we domesticated we saw things about them that we wanted. Like we thought, oh cows, we want their milk. Or 'Oh sheep we want their wool.' With cats we didn't really do anything to attract them to us because humans 10,000 years ago, when we're just transitioning from being hunter gatherers to being farmers, there wasn't anything about cats that we said 'we have to have that.'

So what happened was that cats actually kind of domesticated themselves. We didn't bring them into our farms. They came on their own and that's because humans in these early settlements maybe 10,000 years ago had a lot of big piles of meaty trash around and cats were kind of drawn to eating those. And they came in almost more like raccoons or foxes than something like a cow that we might have intentionally raised.

But over a lot of time in our company cats, began to change their brains and bodies in the same ways that other animals have changed theirs and have become sort of more cuddly so to speak.

[Jane] Pigs and rabbits other domesticated animals have become cute over time with floppy ears or spots. Cats have changed to have some of those traits but not all.

[Abigail] You know, you might have a black cat with some white spots on it that you know might look a little bit different from a wild animal, or you might have a cat like the one my mom has, which looks very much like the kind of wild cat that still lives in the Near East today. And that's because you could almost say that cats are partially domesticated and that they came into our houses not because we wanted them to come but because they wanted to come.

[Jane] You said that there's nothing about cats that we need the same way that we need milk or we need wool or we want those things. Except I guess these days we would say the thing that we want from our cats is love and we don't always get it. Some cats don't seem to like people very much.

[Abigail] That's a really good point, yes. I think one of the secrets about cats is that even though they're not any more closely related to humans than an animal like say a pig is. And certainly they're not as close to us as a monkey is. But cats have faces that look a lot like human faces for reasons that have to do with the way that cats hunt. They have round faces because they have these really short jaws because they're ambush predators and they deliver like a really hard killing bite when they catch things. They have small noses because they're not scent-based predators like dogs sniffing over long distances. And most important they've got these big round eyes planted right in the middle of their faces just kind of how our eyes are too and cats eyes like that for different reasons they have eyes like that because they need good depth perception so they can pounce on things from their hiding places.

But this mixture of facial features that cats have looks a lot like the way humans look and actually a lot the way human kids look. And that's something I think that tends to make people put human emotions onto cats, the fact that they really resemble us.

[Jane] Do you think that cats look like human kids? I never thought of that before. Like humans, cats can have different personalities. And that got one of you curious.

[Natalie] My name is Natalie. I live in Westport, New York. My age is six. And my question is why are cats so crazy and some are not?

[Abigail] That's a great question. So just like people cats can have different personalities. Some are really bold and some are shy and some are just kittens, who like you Natalie, might want to run around and act crazy once in a while. But sometimes when pet cats act crazy or what we would call crazy in a bad way, doing things like scratching us and acting unhappy, it may mean that there's something wrong with the environment that we've created for the cat, especially if it's a cat that lives inside all the time. And this can be sort of upsetting for the cat making it act funny. So one thing that you can do is to sort of make sure that your cat, if you have one, has a private spot in your house where he can go and you won't bother him there and let him kind of rest and hang out there.

And you should also ask your parents to make sure that he has lots of toys to play with because that's important too. And some cats it turns out like to play with toys that look like birds and others like ones that look like mice and others like toys that look like insects. And so it might be even fun for you to try to figure out what your cat's preference is.

[Jane] So if you have a cat likes toys that look like insects and you're giving the cat toys that look like mice, is the cat not going to be as happy?

[Abigail] That might make it crazy. No I don't know that that would... I think that the underlying sort of fact is that cats need stimulation in their environments and some people who have kind of looked at this believe that there are cats that have sort of, will play better with an animal that resembles one kind of prey animal versus another. But the most important thing is to make sure that your cat has ways to have fun and also ways to rest. And I think the resting part, especially I know for me and my kids, you know, we love our cat so much but it's really important to let them have downtime because just like us they need a break and that can improve the way that they act and make them a little less crazy.

[Wade] My name is Wade. I'm three years old. I live in Austin, Texas. Why do cats sharpen their claws?

[Abigail] That's a great question. Something that's really interesting is that even in nature, in the deep woods, in the wild jungles, cats use scratching posts. One time I was in the Serengeti and I saw a tree that had been used as a scratching post by lions for like hundreds and hundreds of years. So it's really important to cats of all kinds, not just house cats, but lynx and mountain lions, all kinds of cats, that they keep their claws sharp. Claws are a very important part of the cat's hunting strategy. Cats are these ambush predators. They're surprise predators. They pounce out of hiding places to catch their prey. And that typically means that it's kind of a one shot deal for them. They have one opportunity to surprise their prey and catch it and sort of bring it down. And having sharp claws really helps you do that.

[Dimitri] I'm Dimitri. I'm nine years old. I live in Inverness. And my question is why do cats purr?

[Jack] My name's Jack. I am six years old. I live in Albuquerque and my question is how do cats purr?

[Jane] So how and why do cats purr?

[Abigail] Cats purr when they force air into their throats where their vocal cords are and they cause the vocal cords to vibrate. Scientists aren't actually sure whether cats can purr on purpose whenever they want to, or whether purring is what's called subconscious, something that cats do without thinking about it.

Cats purr when they're feeling happy but also when they're feeling sick or stressed out and purring may be a way for cats to comfort themselves.

People have even said that the vibrations cats make in their throat may heal cat's injuries if they've sustained injuries in a fight or you know even broken bones.

[Jane] How? How does purring help them heal themselves?

[Abigail] You know that's a really good question. It's something about the frequency of the cat's purr.

It's within a range that's been shown to be helpful in healing injuries and I think even increasing the densities of bones, or it could just be this idea that it's you know just as we find purrs inherently soothing that cats are somehow soothing themselves like maybe you might hum to yourself or something like that. Again it's really mysterious.

But another interesting thing is that purring may also be a way for cats to communicate with people because you know we do like the sound of cats purring and some cats have even learned to disguise in this purr that we found so pleasant the sort of more unpleasant and insistent almost like a subliminal meow noise that's a call for food. This

is a special kind of purr called a solicitation purr and it's one way that cats make sure that we feed them when they want to get fed. So to us it sounds like a purr but inside there's a hidden message that says "feed me."

[Jane] OK so cats might be purring because they're feeling good or because it feels good to their bodies physically to make that noise, or they might be trying to get our attention but how do they try to get the attention of other cats? Do they communicate with one another?

[Abigail] Cats in nature are very solitary animals almost all kinds of wild cats, not just the wild relatives of housecats, but animals like you know mountain lions and Lynx, pretty much all cats except for lions and some would say cheetahs, but almost all of the three dozen or so kind of cat species are solitary animals. This is largely because they're what's called hyper-carnivores. They need a lot more meat to survive than even other meat eating animals like dogs. Cats need a lot more protein and meat than dogs do. So cats live by themselves in nature so they can get enough meat and they don't really like to share. And this means that they're not evolved to be very good communicators because really there isn't anybody else for them to talk to. A mom cat might have kittens around for a year or so but they don't communicate with other adults. They leave these sort of cryptic messages usually in smells on trees for each other and when they do run into each other they often fight or else they mate, which is kind of a different story, but they don't just chat basically.

So that makes it even more special that our pet cats have indeed learned to talk to people living in our houses. Cats have invented unique language of meows that sort of instruct their owners about what to do and cats will have certain rituals like this is 'nice to see you meow.' This is 'feed me now meow.' This is the 'pet me meow' and owners are not wrong to think that they can understand what their cat is talking about because scientists have studied this and found that there is a consistency in these instructions that cats give to us. However the interesting thing is that you can understand what your cat is saying but you can't understand what your neighbor's cat is saying because these languages are basically invented out of whole cloth and are totally unique to an owner and his pet and it can't translate into another household because all the cats basically figure this out on their own independently how to kind of boss us around which is amazing.

[Jane] That is amazing. Let's try an experiment. If you have a cat that lives with you and you can understand when it's saying pet me and when saying feed me and when it's saying look at this delicious dead mouse I just brought in your house. Well, next time you're visiting a friend or someone else who has a cat that you don't live with, see if you can interpret what that cat is saying. Abigail says each cat and its human family

essentially creates its own individual language together. I think that's pretty cool. But even if we understand our cats that doesn't mean we actually speak their language.

Here's a question from Lucy.

[Lucy] I'm six years old. I live in South Duxbury, Vermont. I want to know why cats can purr and we can't?

[Abigail] That is a question that could keep a person up at night. Now I'm going to wonder why on earth can't I purr? Humans can make noises that are a little bit like purring. I tried to purr at my cat it goes something like, purr...But cats can purr without taking a breath to even breathe. They can purr while they're eating. And I confess this would be pretty hard for humans to do. So scientists aren't even sure that all members of the cat family purr. Lynx and other smaller cats can certainly purr. But some of the bigger cats like tigers might not be able to purr. But it's interesting that there are also animals outside of the cat family that can purr like raccoons and you maybe even heard this funny sound of raccoons purring, if you've ever had raccoons living in your attic some of us may have.

[Maya] Hi, my name is Maya. I'm 8 years old. I'm from Montreal. Why do you cats like milk not water?

[Abigail] Cats do drink both milk and water. You know maybe they prefer milk because it has some of the same elements that meat does. It has a lot of fat and protein in it but they do sometimes drink water. But what Maya may be on to here is that cats actually don't need to drink very much water especially compared to something like a dog. They didn't need a lot of water to survive. Before they were domesticated and became our pets, house cats came from the Middle East which is a pretty dry area and this idea that cats don't need a lot of drinking water is one reason that they did well during the colonial times. You know cats do well living on ships during long voyages because they don't need very much to drink. They don't need to tap into the communal supply of drinking water. Even today you know housecats that are just like your pet can survive on remote islands where there aren't consistent sources of fresh water like the Galapagos Islands where Charles Darwin came up with some of his theories about the survival of the fittest.

Cats are very, very good at surviving and part of that has to do with the fact that they can get by without this water resource which is part of what makes it hard for mammals to gain a foothold on these remote islands where cats do so well.

[Jill] I'm Jill from Arlington, Massachusetts. I was wondering is it true that orange cats are only male and if it is, why?

[Abigail] Jill, this is a very astute question here that you have. And it kind of gets you into the realm of genetics but I'm going to try to answer as best I can. So most orange cats, not all but about four out of 5 orange cats are male and this is because female orange cats need two special orange genes to get the orange coat color. They need one from their mom and one from their dad. But male cats only need one orange gene to be orange so it's much easier to be an orange boy cat than an orange girl cat.

But there's still a lot of orange cats of both genders running around the planet. And one thing that's interesting is that in some places like Iceland orange is a more common coat color than it is in most of America. Scientists think that that's because the Vikings when they were traveling around liked orange cats a lot and they took them on their ships and distributed them in certain places where Vikings had colonies. There's another interesting thing about orange coat color and that's that it seems to also have certain behavioral linkages. There are certain behaviors that are associated with orange coats. Orange males are thought to be more aggressive cats than males of other colors. And they tend to do better in rural environments where they have to control a big piece of territory. But in cities where there's a lot of cats of all different colors packed into a small space these orange cats have too many fights and don't do quite as well.

[Jane] I actually have an orange cat for a neighbor. I will admit that I have not personally checked, but my human neighbors assure me that Amiga, the cat, really is a girl.

Jill, did you understand that stuff about sex-linked traits. I'll repeat it just so it's clear. We all have genes that help determine what we look like and how our bodies work. Our genes are passed down from our biological parents. A female has two X chromosomes. A male has one X and one Y. A cat's orange coat color is determined by an X chromosome. Since a male cat only has one X chromosome and a Y chromosome it only needs one orange gene to get to be orange. But a female cat would need to have two orange genes, one on each of its X chromosomes. And that's much more rare because you'd have to have both of those chromosomes telling the cat that it's going to be orange.

That's a pretty simplified version but I hope you get the picture and let me know if you want me to explain chromosomes and Mendelian genetics sometime on another episode. I love this stuff.

Abigail Tucker is the author of the very cool book *The Lion In The Living Room: How House Cats Tamed Us and Took Over The World*.

Thank you Abigail for coming on the show. Now after we talked to Abigail we got one more question about cats.

[Elena] Hi. I'm Elena. I'm eight years old. I live in Williston, Vermont. My question is can cats see colors?

[Jane] Hi, Elena. Yes, cats can see color. Well, some color. Cat's eyesight is different from humans. They can see fewer colors than we can. In fact they probably don't see red and green very well at all. So they have a lot more blue and yellow in their field of vision but they can see wider than we can and they can see a lot better than us at night which makes sense, because they do a lot of hunting in the crepuscular hours of dawn and dusk. That's one of my favorite words. Crepuscular it means twilight so right around dawn and dusk when it's not really light or dark, it's dim, it's crepuscular. Anyway, cats are crepuscular hunters so they need to have eyes that can see really well in dim light.

Thanks to all of you curious cat lovers for sending in those great questions. But dog lovers don't you worry. We've got you covered too. We are releasing a separate episode right now at the same time as this one all about dogs. So check your podcast feed for a companion dog episode to go along with this cat episode.

And we'll be back in two weeks with an eye opening episode about ethics surrounding pets and animals, including why humans have bred cats and dogs in ways that look very cute but are actually not very healthy for the animals themselves.

Speaking of ethics, we'd love to have more questions about the things that puzzle or confound you about the way the world works, ethical dilemmas, moral quandaries. If you have any thoughts about things that are confusing to you and you'd like some help getting answers send them our way.

You can send questions about anything to questions@butwhykids.org. We love hearing your voices. So have an adult record you asking your question on a smartphone, you can use the memo function and then you send that file to us. Be sure to tell us your first name, where you live, and how old you are. We get too many questions to be able to answer all of them on this show but we love hearing from you and we do promise we'll tackle as many as we can.

But Why is produced by Melody Bodette, and me, Jane Lindholm at Vermont Public Radio. Our theme music is by Luke Reynolds. Special thanks this week to Sara Simon and her cat, Clooney, and to Tamika Davis and Schmoopy.