

The Specialness of Black-and-White Cats

From Dr. Seuss's Cat in the Hat to Mistoffelees, the tuxedo cat in the musical Cats, it seems like the most famous cats, both in cartoons and in real life, are black-and-white. Why? Is it the mystery behind their unique coloring or could it be they have a personality that truly stands out?

Analysis by Dr. Karen Shaw Becker

STORY AT-A-GLANCE

- A piebald or bicolor cat typically has large areas of white hair combined with patches or spots of black hair. The alternating color pattern is irregular
- Recent research suggests that piebald patterning in cats is the result of an entirely random process that occurs before birth
- There are several different bicolor patterns, including the tuxedo, the cow, and the cap and saddle

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A "piebald" or bicolor cat's coat has large areas of unpigmented hair (usually white), combined with patches of pigmented hair (usually black). The color of the skin beneath the white fur is also without pigment, and the skin beneath the darker fur is pigmented. The alternating color pattern is asymmetrical.

The word "piebald" is a combination of "pie" (from "magpie"), and "bald," which means a white patch or spot. It refers to the distinctive black-and-white plumage of the **magpie**.

In addition to cats, other animals with piebald coloring include horses, dogs, birds, pigs, cattle, and even some snakes.

Piebald Patches Are the Result of an Entirely Random Process

Results of a recently published study suggest that scientists have discovered the way in which piebald patches in black and white cats are formed during gestation. According to ScienceDaily:¹

"Researchers who set out to learn how pigment cells behave in mice found that they move and multiply randomly during early development rather than follow instructions.

*Their findings contradict the existing theory that piebald patterns form on animals' coats because pigment cells move too slowly to reach all parts of the embryo before it is fully formed."*²

Professor Ian Jackson, Ph.D. of the University of Edinburgh and study co-author offers this explanation:

"The black and white cat has a mutation and it was assumed that because we knew those cells moved through the skin, it was because the cells didn't move fast enough, but what we have shown is actually the cells move faster in the black and white cat or spotted mice.

The problem is there's not enough of them so they don't divide enough, they divide more slowly. It was always imagined that there would be a signal that would tell them where to go, but they just move at random.

It's like diffusion — if you put a drop of milk in a cup of coffee that milk spreads through the whole cup of coffee. Eventually the cells spread through the skin."³

The mathematical model used by the Universities of Bath and Edinburgh scientists may have application in other research to track different cells during early development. Their study results could potentially shed light on medical conditions that develop in utero, for example, holes in the heart.

Piebald Patterns

Piebald or bicolor cats are found among a number of different breeds, ranging from American Shorthairs to Turkish Vans. There are several commonly seen piebald patterns, including the following:

- **Tuxedo pattern** — This is a predominantly black cat with white markings on the chest, tummy, paw, and sometimes the chin and/or nose.



Tuxedo

- **Cow pattern** — A predominantly white cat with black spots or patches on the torso.
- **Van pattern** — A white cat with black markings on the head and tail only.
- **Mask-and-mantle pattern** — A cat with a black back, shoulders, and head, and a white underside.
- **Cap and saddle pattern** — A cat with black over the top of the head, white shoulders, and a large black patch on the lower back, near the tail.
- **Locket pattern** — A black cat with one small white patch on the chest or tummy.

Piebald Personalities

Whether the color of a cat's fur influences his personality is a subject of much debate, and there has been no shortage of opinions offered over the years. In an 1895 book titled "The Cat," author R.S. Huidekoper wrote the following about bicolor cats:

*"It tends more than any other cat to be come fat and indolent, or ragged and wretched, as the case may be. [...] The Black and White cat is affectionate and cleanly, but it is a selfish animal, and is not one for children to play with."*⁴

A study in Bavaria suggests that black and black-and-white cats tend to wander further from home than cats of other coat colors. The study involved a large geographical area, which suggests the tendency may have a genetic basis.⁵

According to Sarah Hartwell of Messybeast, while most cat color/personality reports are anecdotal, there have been studies in which owners or veterinarians were asked to associate particular colors with particular personality traits.⁶ The study participants reported that black-and-white Persians were "placid," black-and-white British Shorthairs were "even-tempered and friendly," and black-and-white mixed breeds were "wanderers."

In 1973, in a Pedigree Pet Foods book called "Your Guide to Cats & Kittens," the author asserts that black-and-white Persians are "excellent ratters and mousers."⁷ Early in the 21st century, George Ware, a British boarding cattery owner offered his own theory of colors and temperaments. Based on personal experience, Ware suggested that black-and-white cats are:

*"True lap cats. Very loyal to their family, especially to a particular family member. Liable to be moody."*⁸

Prominent Piebalds

- Mistoffelees, the tuxedo cat in the musical "Cats"
- Famous black-and-white cartoon cats include Tom of Tom and Jerry, Felix the Cat, Kitty Softpaws of "Puss in Boots" (the Shrek spin-off), Sebastian from "Josie and the Pussycats," and Sylvester
- Dr. Seuss's "Cat in the Hat" is a tuxedo
- The Clinton family's tuxedo cat, Socks, lived in the White House from 1993 to 2001
- Humphrey was the black-and-white "Chief Mouser" at 10 Downing Street, the official residence of the U.K. Prime Minister, for 18 years

Sources and References

[Gizmodo January 10, 2016](#)

[MetaphoricalPlatypus.com](#)

[Wikipedia](#)

¹ [Nature Communications 7, Article 10288, January 6, 2016](#)

² [ScienceDaily, January 6, 2016](#)

³ [The Telegraph, January 6, 2016](#)

^{4, 5, 6, 7, 8} [Messybeast](#)
