

NATURE VERSUS NURTURE: DO GENES PREDICT PERSONALITY?

Imagine learning that you have a long-lost identical twin. If you were to meet them in person, you'd expect to share certain features like your bone structure, skin color, or the sound of your voice.

But no more than that, right? You are unique, and you wouldn't expect your twin to share your hobbies, your skills, or your taste in friends because you've worked hard to cultivate those over the course of your life. Your experiences and environment will have differed from an estranged twin, no matter how physically similar.

However, this is exactly what happened to the Jim twins. At age 39, James "Jim" Lewis and James "Jim" Springer, identical twins estranged at birth, met for only the second time in their lives. Both Jims lived in Ohio, had a beloved childhood dog named Toy, excelled at math and woodworking, struggled with spelling, chain smoked, drove a Chevrolet, and worked in security—including a stint each as a sheriff in different Ohio counties. Coincidentally, both sets of adoptive parents named their son James (for which Jim was the most common nickname). Stranger still: each Jim married a woman named Linda, divorced her, and then married a woman named Betty. Both also had a son named James Alan.

Hard-Wired Traits or Learned Traits?

You might have studied philosophers Jean-Jacques Rousseau and John Locke. They proposed the idea that people start their lives as blank slates and experience carves each person's "blank slate" into a unique personality. Even into the 20th Century, this idea persisted with the belief that early childhood events have more influence than genetics on what kind of adults people become. If that were true, though, how could estranged twins like Jim Lewis and Jim Springer lead lives that seem as structurally identical as their DNA?

Behavioral scientists wanted to know the answer to that question. The Jim twins went on to participate in a research study with other pairs of reunited identical twins. This case and others influenced theories of nature versus nurture, which is the debate around the effects of hereditary factors (nature) versus environmental factors (nurture) on behavior.

In this debate, "nature" refers to "hard-wired" traits—everything influenced by genetic inheritance and other biological factors. The Jim twins, for example, have near-identical facial features. "Nurture" refers to traits affected by a person's environment, including what they've learned and their experiences in early childhood, family and social relationships, culture, and community. The name "James," for example, was the single most popular name for baby boys during the Jim twins' birth year according to Social Security Administration records. "Linda" and "Betty" were also among the top 20 baby girl names for the time.

Think about what traits you've inherited from your family members. Think about how your behavior has changed as you've grown older. Maybe your height comes to mind as a product of genetics—something that is said to run in your family. Your personality, on the other hand, probably differs quite a bit even from other close family members. It's probably not too difficult to trace back to your genetics or your unique experiences many of the traits that make you unique.

So why is it that the Jim twins, despite leading different lives shaped by unique experiences, have personalities so similar that a scientific test found nearly identical brain waves and personality test scores so close that it looked like the same person took the test twice?

Binary or Inseparable?

Not all identical twins are the same height. If one twin were to grow up in a household without regular meals, she could be shorter than her genetically identical twin who had access to plenty of healthy foods. This is why the Jim twins' study is so important to the nature versus nurture debate—the study's findings blurred the line between categories once thought to be neat and distinct.

Decades ago, researchers positioned themselves as either “nativists” or “empiricists,” depending on whether they believed behavior, personality, and intelligence were determined by genetics (nativists) or life experiences (empiricists). Today, however, that either/or relationship is no longer accurate or useful. Current research increasingly reveals that nature and nurture play overlapping roles in development and behavior; in fact, they are inseparable. The extent to which your genetics affect your behavior depends on the environment in which you live, work, and play. As a result, psychological researchers study not *how much* nature and nurture affect individuals, but how nature and nurture *interact*.

The fields that focus on the interplay of nature and nurture include *behavioral genetics*, which studies the genetic impact on variations in behavior; *polygenic inheritance*, which looks at the effect that large groups of genes collectively have on a person's behavior; and *epigenetics*, which is a new area of research that focuses on how environmental influences affect the expression of genes—in other words, how your experiences activate certain parts of your genetic code.

One fascinating example is the development of a particular skill: perfect pitch. Perfect pitch is the ability to detect the pitch of a musical tone without any reference. For example, if you were to play any key on a piano, a musician with perfect pitch would be able to tell you which note you played (e.g., “a high C-sharp”). Researchers have found that this ability runs in families, and it might even be tied to a single gene. However, possessing the gene alone is not enough to develop perfect pitch as a skill. Instead, musical training during early childhood is necessary to allow this inherited ability to manifest itself. In other words, even if the right genetics are present, they need the right environment to be expressed.

While genetics have a considerable effect on your behavior and personality, most of your behavioral traits cannot be traced to specific genes or family characteristics. Instead, several of your traits are likely associated with and influenced by an even greater number of genetic variants. In other words, where genetics affect your personality, it's not the result of a 1:1 ratio of genes to personality traits. Rather, it is a result of a collection of genes that contribute a very small amount to the expression of a given trait.

Even the Jim twins, who seem like living proof of genetics shaping personality, recognize their differences. According to Jim Lewis, “The differences between Jim and me may be the differences between living in the city and country.”

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