HUMAN NATURE EXPLAINED

Humans are weird. We're mesmerized by shiny things, we go bonkers for chocolate, and we turn to jelly at the sight of a cute widdle baby...awww! Also, humans are, for the most part, cynical and distrustful. How did we turn out like this? The reasons may surprise you.

BACKGROUND

Biologically speaking, evolution is the process by which cumulative changes occur in a population over several generations. These changes take place on a genetic level, and are often the result of a mutation that, for whatever reason, gives some individuals an advantage over others, allowing for future generations to inherit the genes. The mechanism that drives this process: *natural selection.* Though sometimes called "survival of the fittest," it's not necessarily the biggest and the strongest that make it to breeding age—especially when it comes to that most complex animal: us.

The current consensus among anthropologists and evolutionary biologists is that the first primates to acquire proto-human features showed up about six million years ago. Our species, *Homo sapiens,* showed up between 200,000 and 300,000 years ago during the Middle Paleolithic era, marking the beginning of the Stone Age. "Modern humans" date back to roughly 50,000 years ago in western Africa. And a great deal of who we are today was shaped by the obstacles our prehistoric ancestors had to overcome, and many of those tendencies remain...for better or for worse. Here are some common questions about why we are the way we are, and leading scientific theories that attempt to answer them.

WHY DO SOME PEOPLE HAVE BLOND HAIR?

After early modern humans banded together and ventured north out of Africa to the colder climes of Europe, an Ice Age nearly drove them to extinction. That was about 11,000 years ago. Up until then, all our ancestors had dark skin, dark hair, and brown eyes.

Those unending winters led to longer hunts and fewer hunters returning to the cave, resulting in a shortage of males in northern Europe. According to Canadian anthropologist Peter Frost's 2008 theory, genes for blond hair took hold because of "sexual selection," a concept introduced by Charles Darwin in the 1850s—which Darwin defined as "the advantage which certain individuals have over other individuals of the same sex and species solely in respect of reproduction." During that Ice Age, a rare genetic mutation occurred in some females, giving them blond hair and blue eyes. Frost contends that the fair-haired females "stood out" in a crowded field, and made them more desirable. "Intense female-female competition may explain an

unusual convergence of color traits in northern and eastern Europeans," he explains, adding, "Intense male-male competition may explain increased masculinization of body build in highly polygynous [several females for one male] agricultural populations of sub-Saharan Africa." (Translation: Buff guys got more women.)

That wasn't the first time a genetic mutation for blond hair cropped up, but because of the specific set of harsh conditions, the trait caught on, even though it serves no physical advantage. But how much did it really catch on? If it seems like there's an abundance of blondes out there, that's only because they're overrepresented in European and North American popular culture. In reality, only 2 percent of humans alive today have naturally blond hair.

Bonus: Depigmentation of skin color was a separate process that took hold in Europe about 3,000 years *after* blond hair emerged. Lower levels of solar radiation required less natural protection—which dark skin provided—so genes for lighter skin got passed on.

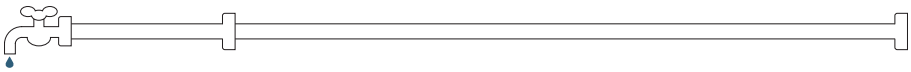
WHY DO WE LOVE SHINY THINGS?

It was once assumed that our adoration of all that glitters is due to its association with monetary wealth, but money is a relatively new addition to the human equation (circa 3,000 to 5,000 years ago). And a love of money doesn't explain why babies prefer shiny objects to dull objects (and are even more likely to put them in their mouths). It also doesn't explain why some indigenous cultures that have no currency are also transfixed by shiny things. Even crows have been observed fighting over shiny things.

According to researchers at the University of Houston and Ghent University in Belgium, ancient humans took a shine to shiny things because they were thirsty. For our nomadic ancestors lost in the desert, a glimmering oasis on the horizon could lead them to life-sustaining water. In 2013, the researchers tested this theory. After first concluding that, in general, test subjects preferred glossy pictures to duller matte pictures, the scientists gave some participants water and salty crackers...and others *only* got the crackers. From the findings: "The thirstier participants got, the more they preferred glossy pictures."

WHY DO WE LIKE TO THROW THINGS?

A major league pitcher can hurl a baseball at 90 miles per hour, hitting a target 60 feet away that's no bigger than the ball itself. Even toddlers can throw objects at a high rate of speed with remarkable accuracy (a skill they sometimes display at the worst possible times). This is notable because throwing is the only thing *Homo erectus* was better at than every one of its predators. They certainly weren't stronger than big cats, wolves, or bears. Or faster. But when our ancestors learned to walk on two legs, that freed up their opposable thumbs to grip objects. Throwing came later.



The Washington National Cathedral in D.C. has a gargoyle shaped like Darth Vader.

In 2013, Neil Roach, an anthropologist at the Center for the Advanced Study of Hominid Paleobiology at George Washington University, reported that, two million years ago, a physiological change developed in the ligaments and tendons of *Homo erectus*'s shoulder, giving it more elasticity. This allowed their shoulders to store energy when positioned back, resulting in incredible forward momentum when released. This physiological change, combined with superior mental acuity and stereoscopic vision (which allows for accurate depth perception), gave these cunning primates deadly accuracy. A lone, barehanded *H. erectus* was no match against a saber-toothed tiger, but a small group wielding baseball-sized rocks could easily take out a big cat, or chase away a pack of hyenas from their kill. All of a sudden, there was a lot more to eat. "This dietary change led to seismic shifts in our ancestors' biology," Roach told BBC News, "allowing them to grow larger bodies, larger brains, and to have more children, and it also did interesting things to our social structure. We start to see the origins of divisions of labor around that time, where some would be hunting, others would be gathering new foods."

Roach's hypothesis hasn't been universally accepted, as it's impossible to determine from bones exactly how prehistoric shoulders operated. But whether we got good at throwing two million years ago or much later, we still do it better than every other animal.

WHY DO WE HAVE A SWEET TOOTH?

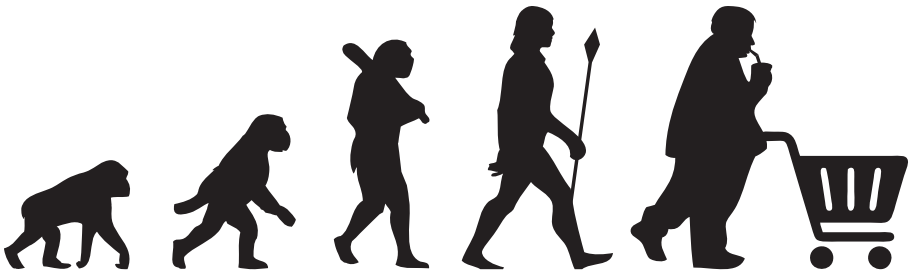
"Sugar is a deep, deep ancient craving," says biologist Daniel Lieberman of Harvard University. It made a lot more sense in prehistoric times, he says. Whereas modern humans in need of a midday boost can grab a candy bar or an energy drink, nothing packed more of a punch for our early ancestors than a ripe piece of fruit dangling from the canopy. The riper the fruit, the sweeter its meat, and the more vitamins and energy it provided. That was crucial for the survival of these proto-humans, who spent most of their day foraging and hunting, and avoiding constant threats. The primates that ate the most fruit gained an energy advantage, and over time, natural selection yielded a craving for sweets.

When Earth's climate cooled about 1.5 million years ago, a genetic mutation took hold that allowed the sugars in the fruits—which our bodies break down into glucose and sucrose—to be stored as fat. That was good news for our always-on-the-go ancestors, and not such good news for us today. Biologists like Lieberman refer to this as the "evolutionary mismatch concept," meaning our ancient bodies aren't well adapted to our modern environment.

For example, our brains have the same sweet cravings as our prehistoric counterparts, but we lack the active lifestyle of our ancestors, so that fat doesn't get burned. "We have created a kind of positive-feedback loop that I call 'dysevolution,'"

Ka-ching! Each time you listen to a song on Spotify, the artist receives $0.00437.

explains Lieberman. "We are eating diets and leading lives that contribute to poor health. Then, when we get sick, instead of treating the causes of those diseases, we treat the symptoms, enabling the disease not only to continue but also to become more prevalent. I think that's why the rates of obesity and Type 2 diabetes and various kinds of cancer are going up—because we are not dealing with the causes of these problems." Here's another way to explain it:



WHY ARE PEOPLE SO PESSIMISTIC?

Even the most optimistic "glass half full" person seems to understand that it takes more than a smile to be your umbrella; one has to prepare for rain. This isn't merely common sense. It's a pessimistic view of life that was hardwired into us long ago. According to psychologist Martin Seligman in his 2018 book *The Hope Circuit*, "The species that [was] going through the Ice Ages had been bred, and selected, through pessimism. The mentality that said, 'It's a beautiful day in San Diego today, I bet it'll be beautiful tomorrow' got crushed by the ice. What got selected for, in the Ice Ages, was bad weather animals, who were always thinking about the bad stuff that could occur. So what comes naturally to people is pessimism."

He further points out that while pessimism helped our ancestors endure long winters, there's an overload of it today that's leading to mass distrust and division. And pessimism isn't something you can overcome just by willing it away. But there is good news, says Seligman, a pioneer in an emerging field called "positive psychology." We can achieve harmony and happiness, but not by *trying* to be happy. His method, which he abbreviates as PERMA, recommends adding more of these things to your life: "positive emotion, engagement, relationships, meaning, and accomplishment." (Go ahead and try it, but it probably won't work.)

WHY DO WE HAVE SUCH BIG BRAINS?

Scientists often refer to the human brain as the "crowning achievement of evolution." It's the reason why only one species out of millions has managed to create enduring cultures and build ships and travel to space. Physiologically, our brain isn't much different from a chimpanzee's or even a mouse's. What we do have are more *glial cells*,

World's biggest coal exporter: Australia. It exports roughly 90% of the coal it produces, accounting for 32% of total global coal exports.

which may be the key to our advantage. They're associated with *brain plasticity,* the ability to react to changing conditions.

It requires a tremendous amount of energy to operate such a big brain, more than can be attained from raw vegetables (unless they're eaten in huge quantities). Richard Wrangham, an English primatologist, realized this while studying the diets of chimpanzees in the 1990s (he studied under Jane Goodall as a grad student). Although chimps share many characteristics with humans, their brains are much smaller than ours, so he wondered, "What would it take to convert a chimpanzeelike ancestor into a human?"

Wrangham compared modern chimps to the fossil evidence of *Homo erectus,* a proto-human primate that lived 2 million to 1.6 million years ago. *H. erectus* was the first ape with a much larger brain—50 percent bigger than that of its predecessor, *Homo habilis.* When *H. erectus* ventured out of the forest for the open savanna, there was less cover and harsher, hotter conditions. This is where brain plasticity comes in. Hunting required cooperation, and cooperation required planning, abstract thought, and being able to quickly change plans to turn defeat into victory. Those cognitive abilities required a complex brain firing millions of synapses per second. Only the most intelligent *H. erectus* survived long enough to procreate.

That explains the behavioral mechanisms that led to a bigger brain, but what happened physiologically? According to Wrangham, the fuel came in the form of calories derived from cooking tubers, which breaks down the raw fibers into energy-packed starches, the ultimate "brain food." It's uncertain how or even if *H. erectus* learned to control fire and cook food, but Wrangham asserts that this is the only diet that could have fueled such rapid brain growth.

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That laid the evolutionary groundwork for other physical changes first seen in *H. erectus*: smaller teeth and smaller stomachs—like we have. By comparison, a chimpanzee has much larger teeth and would have to eat several pounds of raw tubers per day to get the calories of a cooked one. Studies have shown that chimps prefer cooked food, and some take right to cooking when they're taught, giving credence to Wrangham's theory that *H. erectus* tamed fire.

Other anthropologists contend that cooking didn't begin until a few hundred thousand years ago with the Neanderthals, or even much later. So if not by cooking, then how did *H. erectus* get their brains? Improved hunting techniques expanded their omnivorous diets, which made available large quantities of calorie-rich soft tissue like bone marrow and brain tissue. But however or whenever it occurred, the science does point to a change in diet resulting in a bigger brain, which led to things like language, the wheel, and PTA meetings.

Most spiders have eight eyes—two rows of four eyes each.

WHY DO WE FIND BABIES SO DARN CUTE?

"Oh my god, your baby is soooo adorable! I could just eat him up!" That's something an otherwise well-adjusted adult might say, and no one would bat an eye. This curiously aggressive response is triggered not just by infants but by any baby animal—especially other mammals, from kittens to baby elephants. But it can also be triggered by tiny tree frogs or fuzzy chicks. The characteristics that trigger this response—a miniature body, miniature head, proportionally larger eyes, smaller nose, and bonus if it's pudgy or furry—make up what Austrian zoologist Konrad Lorenz called *kindchenschema,* or "baby schema," the theory that these combined factors compel us to want to care for the thing.

This response is a by-product of our brain's delayed development. Humans have small heads. If our heads were any larger, they wouldn't be able to fit out of the birth canal. Why wouldn't natural selection yield a larger birth canal? Because humans are bipedal animals, and a wider birth canal would impede walking on two legs. Once our species attained the ability to stand up and see over the top of the savanna grasses, the size of the human birth canal was set.

Because we have the most complex brain in the animal kingdom, and one of the largest in proportion to the body, the brain is still years away from fully developing by the time the fetus's head has grown to its birthing size. This isn't the case when it comes to the young of less-intelligent animals—such as a newborn deer that lands awkwardly on its feet and only requires a few licks from its mom to start stumbling around. In contrast, it takes newborn humans about eight months before they can stand up without any help.

Raising such a helpless creature requires, to put it simply, love. Through natural selection, we gained a fondness for the *kindchenschema* characteristics, which activate the part of the brain associated with motivation and reward. What's the reward? Dopamine. It's the same "feel-good neurotransmitter" our brains release when we're in love (or having dessert). The *kindchenschema* response is so strong that we're even compelled to take care of *other* babies. This gave our ancestors an "it takes a village to raise a child" approach to culture.

But what about the "I could eat you up!" part of the response? This is called *cute aggression.* Though its exact purpose is uncertain, it could be a way for us to "come down" from the cuteness high. Displaying an aggressive emotion counters the effect of all that dopamine, allowing you to quickly return to your well-adjusted self.

According to psychologists, human babies reach "peak cuteness" at five or six months. It's around this time that they pick up on our positive reaction and act even cuter to keep that reaction coming. As early as three years old, toddlers have been observed responding to cuteness in younger babies as well as other fuzzy widdle tings with big puppy-dog eyes. Especially puppies. For that story, feel free to grab a plastic poop bag and take a walk to page 398 for "It's a Dog's World."

Don't believe us? Count 'em: If you're healthy and average, you'll fart between 14 and 23 times today.