

YMIGHT?

“Was I born smart or is it something I earned?” —Gillian, age 10

Every GT has at least one pair of “designer” genes (for high intelligence, creativity, athletic skills, or leadership ability, for example). In other words, some of your giftedness is actually a *gift*—inherited from one or both of your parents, or perhaps a grandparent or other close relative. This means that features of your brain may be similar to those of one or more of your family members. Just like brown hair or blue eyes, gifted brains can run in families.

Meet Your GT Brain

“So my brain actually looks different from some other brains because I’m gifted?” you might ask. The answer is almost certainly: yes! Scientists have measured the brains of many different people and used MRI scans to record activity levels in particular areas of the brain. Their studies have shown a number of interesting things.

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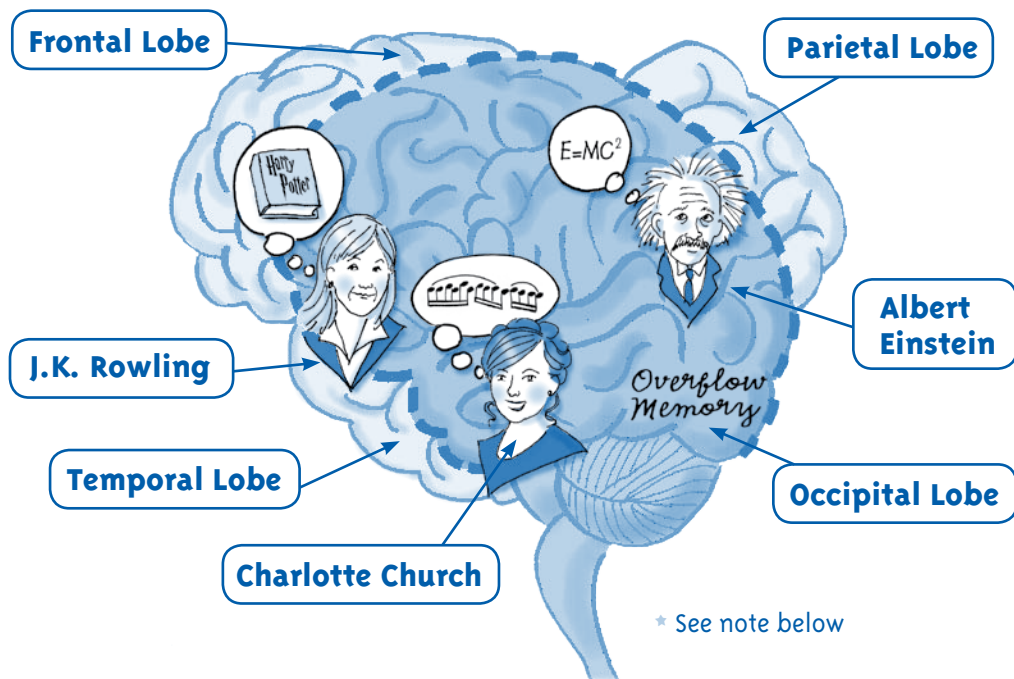
MRI noun: MRI stands for magnetic resonance imaging, a medical procedure that uses radio waves to create computerized images of internal body tissues

Bigger Is Brighter (. . . or Is Brighter Bigger?)

There is a clear link between how intelligent you are (based on test scores) and how big your brain is. As a GT, you likely have more brain matter in your brain, especially in your *frontal lobe* (see diagram), which processes most general intellectual tasks. Of course, it’s hard to know which came first: your big brain or your big IQ. In other words, did your big brain make you smart? Or did your smarts cause your brain to grow bigger over time?

One thing is certain: GTs’ brains are wired differently from other people’s brains. A brain is basically a jumble of about 100 billion electrical wires, called neurons, which “talk” to one another and make connections. And the more neural connections you have in a given area of your brain, the bigger that area will be.

For example, Albert Einstein’s *parietal lobe* (see diagram), which is responsible for retrieving and processing math facts, was 15 percent larger than normal. Likewise, if you are gifted in music, like young opera star Charlotte Church, then your left *temporal lobe* (see diagram) is probably



bigger than average. What if you're a gifted writer, like *Harry Potter* author J.K. Rowling? Then both your frontal lobe and left temporal lobe might be enlarged, because you've got tons of neurons chatting away in the two main language-processing centers located in those areas.

However, some areas of GTs' brains have also been found to have less brain activity and fewer neural connections than normal, a fact that has long confused scientists. The current theory is that gifted people's brains might simply build more efficient circuits in certain areas, so they are able to function better using less energy. Who knew that even your *brain* could be "energy efficient"?

**"Being gifted means having a big vocabulary
and a big brain."** —Jonas, age 10

Faster Is Brighter, Too

In addition to possibly inheriting a larger brain, you may also have inherited a faster brain. Genetics are a strong predictor of how fast a person develops neural connections. Evidence exists that your environment and your habits (like studying and practicing) can also help speed up these connections. Whatever the reason, your GT brain takes less time than average to turn new knowledge into routine knowledge—in other words, to learn.

Chances are that as a young child, and even as a baby, you were already showing signs of this faster learning speed. For example:

- ★ When you were 2 months old you might have played with a rattle. A baby in the crib next to you at childcare may not have been able to do that for at least another month.
- ★ When you were 1 year old, you might have already been walking up stairs. Your playmate down the block might not have been able to do that until he was a year and a half.

- ★ And when you were 4, you might have been drawing realistic people with heads, necks, and hands, while some other kids in your preschool may not have done that until they were 6.

Loaded with Memory

If you think of your GT brain as a computer, you've now learned that it has a larger hard drive and a faster processor than most. Well, as it turns out, it *also* comes loaded with extra memory. When you're working on a complex problem-solving task, like a crossword puzzle or a math problem, your brain needs to store and retrieve lots of pieces of information from its memory bank.

In most people, this memory bank is only in the frontal lobe. But experiments show that in gifted people, the *occipital lobe* in the rear of the brain (see diagram) is also active during complex tasks, providing you with lots of space and power to quickly solve problems. This extra storage area also allows you to make more and faster connections between new things you learn. How cool is that?

Better Blood Flow & Communication

In addition to all of the electrical “juice,” your GT brain also gets blood pumped into it—a *lot*. Your brain contains roughly 100,000 miles of blood vessels (enough to stretch almost halfway to the moon!) and recent MRI scans of the brains of kids highly gifted in math, for example, show *seven times* the normal blood flow to all parts of their brains active during math work. And finally, as if that weren't enough, the two halves of your brain (the right and left hemispheres) are likely best buds and communicate far better than average brain halves do. For this reason, many GTs tend to be at least somewhat ambidextrous.



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am•bi•dex•trous adjective: able to use both hands equally well; skillful

Using the latest technologies, neuroscientists (brain researchers) are constantly discovering fascinating new things about how people think, feel, and learn. In fact, it's possible that in the future, a person's intelligence will not be measured by IQ tests or college-entrance exams, but by a simple scan of her or his brain. A little freaky, huh?

Nature & Nurture

So certain brain features you've inherited are part of why you're gifted—but that's definitely not the whole story. Where you live, what you do, and everything and everyone around you also play a very important role. From the day you're born, your surroundings, your lifestyle, and your choices either build on or take away from your natural abilities.

You can think of your genes as forming the roots of a tree. As a GT, you likely have some very sturdy, healthy roots. But how big and healthy the branches and leaves grow depends on how well the tree (you) is cared for and nurtured. Do you live in a home where people value learning? Do you eat healthy food and get enough sleep? Do you exercise? Do you try new things? Are you loved and supported? Just like a tree, you need nurturing from your environment in order to build on your roots.

“Healthy neurons are lush and bushy looking with lots of connections to other neurons.” —Dr. Nadia Webb, neuropsychologist

Will I Always Be GT?

The “roots” of your giftedness will always be present, deep in your genetic code. But a lot depends on how others (like your dad or mom, teachers, and even friends) help or do not help you, and also on how *you* help or hinder yourself. For example, if you think to yourself, “I’m not that smart . . . I can’t do this . . . I give up!” you’re much less likely to build new neural “highways” and enhance the way your brain works. You’ll be far more successful if you say, “I can handle this . . . I’m smart . . . I’ll persist.” (See the section on self-esteem, pages 64–65, for more details on this.)

You’ll also ensure your smarts stay in tact by simply using them—a *lot*. In one experiment, scientists put volunteers through a brain “boot camp.” They first gave them an intelligence test. Then, they gave the people a bunch of harder and harder memory tasks to do, such as solving puzzles. When the volunteers were retested, every single person increased their ability to reason, solve problems, and think more quickly. So, in some ways your brain is pretty simple: You either use it or lose it. And if you use it enough, there may be no limit to how smart you can get.

NOT FEELING NURTURED? See page 76 for a list of people who might be able to help.

How Smart Do I Get When I’m Gifted?

Your brain processes around 400 billion bits of information every second (that’s about equal to scanning more than 11,000 *encyclopedia volumes in one second!*). But on average, you are only aware of roughly 2,000 of these bits—mostly concerned with your body (Am I cold? Hungry?), your environment (Where am I? Where am I going next?), and time (When is my assignment due? What time is my violin lesson?). However, scientists suggest that through intense observation, conscious choice, and creative thinking, it is possible to integrate more data.

In fact, the human brain is *unlimited* in its potential for taking in information.



Check It!

Neuroscience for Kids

Explore your brain, spinal column, and entire nervous system. Take a “fly-through” journey to see each layer of your brain, discover the differences between male and female brains, learn how chocolate affects your nervous system, and more!

faculty.washington.edu/chudler/neurok.html