We know in our gut when we’re hearing a good story—and research is starting to explain why.
Stories are told in the body.
It doesn’t seem that way. We tend to think of stories as emerging from consciousness—from dreams or fantasies—and traveling through words or images to other minds. We see them outside of us, on paper or on screen, never under the skin.

But we do feel stories. We know in our gut when we’re hearing a good one—and science is starting to explain why.
Experiencing a story alters our neurochemical processes, and stories are a powerful force in shaping human behavior. In this way, stories are not just instruments of connection and entertainment but also of control.
We don’t need the science of storytelling to tell a story. We do, however, need science if we want to understand the roots of our storytelling instinct and how tales shape beliefs and behavior, often below conscious awareness.
As we’ll discuss, science can help us to defend ourselves in a world where people are constantly trying to push our buttons with the stories they tell. The better we understand how stories unfold in our bodies, the more equipped we are to thrive in the story-rich environment of the twenty-first century.

**Punched in the gut**
Imagine your attention as a spotlight. When someone tells you a story, they are attempting to control that spotlight. They are *manipulating* you.
We all do this every day, all the time. You try to hold attention as you tell a story to coworkers over coffee; I’m trying to hold your attention as I tell the story of the science of storytelling. There are many different ways to draw the spotlight of other people’s attention—and all of them instinctively or deliberately tap into basic human drives. Here, for example, is a very short story attributed to Ernest Hemingway.

How does this story make you feel? I can speak for myself: When I first encountered it as an undergraduate, my attention was instantly captured. And when I realized, after a beat, what it meant, I felt punched in the gut. The story works because it triggers our natural negativity bias—that is, the hardwired human tendency to focus on the bad, threatening, dangerous things in life. It specifically activates the fear and despair we’d feel if our child died, even if we don’t yet have one of our own. We’re really good at focusing the spotlight of our attention on what might hurt us—or hurt those close to us, especially our children. What happens in our bodies when we throw the spotlight on a threat? We get stressed out.

And what’s stress? That’s a tool nature gave us to survive lion attacks—in other words, stress mobilizes our body’s resources to survive an immediate physical threat. Adrenaline pumps and our bodies release the hormone cortisol, sharpening our attention and boosting our strength and speed. But unlike other animals, humans have the gift and the curse of being susceptible to stress even when we don’t face a direct physical threat. This we do by telling ourselves, and each other, stories. They are the best way we have to communicate potential threats to other humans—and help each other to prepare for overcoming those threats.

Most of us will never face a flesh-and-blood lion, yet in stories we transform lions into potent symbols of beautiful death. That’s the essence of many stories: facing and overcoming dangers, which will persist, multiply, and mutate in our minds and, in some cases, become metaphors for more-immediate dangers.

As Neil Gaiman writes in his novel *Coraline*: “Fairy tales are more than true: not because they tell us that dragons exist, but because they tell us that dragons can be beaten.”

When someone starts a story with a dragon, they’re harnessing negativity bias and manipulating the stress response, whether they intend to or not. We’re attracted to stressful stories because we are always afraid that it could happen to us, whatever “it” is—and we want to imagine how we would deal with all the many kinds of dragons that could rear up in our lives, from family strife to layoffs to crime.
But we don’t necessarily need dragons to capture attention, right? At the very beginning of J.K. Rowling’s Harry Potter series, she slowly introduces us to a babe, alone in the world, under constant threat. We instinctively take the side of the “boy who lived” because at the beginning of the story, he’s so vulnerable. Most of the Star Wars films take another approach, by trying to inspire a sense of awe—the emotional reaction to something so vast we can’t immediately grasp it—which research shows triggers behaviors associated with curiosity, like turning to other people for answers.

**How stories unfold in our bodies**

While authors can capture our attention in many different ways, sooner or later a villain will appear and a conflict will develop. *Harry Potter and the Sorcerer’s Stone* may start gently, but Lord Voldemort looms in the background. As the action rises and Harry’s society of witches and wizards slides toward civil war, our attention sharpens and our bodies release more cortisol. If that doesn’t happen, a story loses us. Our spotlight turns to something else.

But cortisol alone isn’t enough to keep our bodies engaged with a story. The conflicts in Harry Potter and Star Wars grab our attention—and the settings can inspire awe and wonder—but they wouldn’t involve us nearly as much if they didn’t also include characters we come to care about. As we see fictional characters interact, our bodies tend to release a neuropeptide called oxytocin, which scientists first found in nursing mothers. Oxytocin has subsequently turned up in studies of couples and group-bonding—indeed, we find oxytocin whenever humans feel close to each other, or even just imagine being close. That’s why stories trigger oxytocin: When Princess Leia finally told Han Solo that she loves him in *The Empire Strikes Back*, your body almost certainly released at least a trace level.

That’s not all that’s happening as we become involved in a story and its characters. The brain activity of both storytellers and story listeners starts to align thanks to mirror neurons, brain cells that fire not only when we perform an action but when we observe someone else perform the same action. As we become involved with a story, fictional things come to seem real in our bodies. The storyteller describes a delicious meal and the listener’s mouth can start to water. When the characters in the story feel sad, the listener’s left prefrontal cortex activates, suggesting that they feel sad as well.

As the plot thickens, the good author pushes the characters we care about into conflict with the villain. Our palms sweat, we grip the hand of the person next to us—who is likely having the same reaction. We might feel the
tension in our neck. Our body is braced for a threat, but the threat is completely imaginary.

That’s when the storytelling miracle comes to pass: As the cortisol that feeds attention mixes with the oxytocin of care, we experience a phenomenon called “transportation.” Transportation happens when attention and anxiety join with our empathy.

In other words, we’re hooked. For the duration of the story, our fates become intertwined with those of imaginary people. If the story has a happy ending, it triggers the limbic system, the brain’s reward center, to release dopamine. We might be overcome by a feeling of optimism—the same one characters are experiencing on the page or screen.

Where do we end and where does the story begin? With the most intense, involving stories, it’s hard to tell.

**How stories bring people together**

Why in the world would evolution grant us this ability? Why would nature actually make us crave stories and make transportation a pleasurable experience?

I’ve already suggested part of the answer: We need to know about problems and how to solve them, which can enhance our survival as individuals and as a species. Without a problem for the characters to solve, there is no story. But there might be other reasons. Recent research suggests that this process of transportation in fiction actually increases our real-life empathic skills. Studies published in 2013 and 2015 exposed people to literary fiction or high-quality TV—and then gave them the “mind in the eyes” test, in which participants look at letterboxed images of eyes and try to identify the emotion behind them. In the 2015 study, participants who watched *Mad Men* or *The Good Wife* scored significantly higher than did those who watched documentaries or simply took the test without first watching anything.

In other words, the empathic skills we build with stories are transferrable to the rest of our lives: They are advantageous in real-world situations where it helps to have insight into what another person is thinking or feeling—situations like negotiating a deal, sizing up a potential enemy, or understanding what our lover wants.

All these qualities make stories adaptive, in evolutionary terms. They’re not just nice to hear. They can actually increase our chances of survival.

**How stories change behavior**

Research finds that stories shape our behavior in other ways that can help us to thrive.

Study after study after study finds that stories are far more persuasive than just stating the facts. For example, one found that a storytelling approach
was more effective in convincing African-Americans at risk for hypertension to change their behavior and reduce their blood pressure. A study of low-performing science students found that reading stories of the struggles of famous scientists led to better grades. A paper published last year found that witnessing acts of altruism and heroism in films led to more giving in real life.

Indeed, stories actually seem to trigger the neurochemical processes that make certain kinds of resource-sharing possible. This biological activity can lead to profound behavioral changes, including costly acts of altruism. When Claremont Graduate University economist Paul Zak and colleagues showed a dramatic film of a father and son struggling with cancer, they found that both cortisol and oxytocin spiked in nearly all of the viewers—and that most of them donated a portion of their earnings from the experiment to nonprofits. This didn’t happen in participants who watched a simple film of the father and son wandering around a zoo. In fact, the researchers found that the more cortisol and oxytocin released, the more likely participants were to make charitable donations—and in one experiment, Zak found that hormone levels predicted donations with 80 percent accuracy.

This is the neurochemical process that makes fundraising and taxes possible—and inspires people to mobilize large-scale support for enterprises like political campaigns, churches, universities, libraries, or, for that matter, the United States as a nation. Stories enable us to form relationships with strangers and ask them to make small sacrifices for something that is larger than themselves.

I picked Star Wars and Harry Potter as examples because those are “master narratives” that have been embraced by, without exaggeration, billions of people. There’s something awe-inspiring about the idea that those stories have changed so many people right down to the molecular level, all of them together feeling that spike of cortisol when Darth Vader appears or that soothing flow of oxytocin when Hermione throws her arms around Ron after they escape some Death Eaters, our bodies resonating with each other across time and distance. These global narratives don’t just entertain; they also impart ideals of heroism, compassion, and self-sacrifice.

The dark side of storytelling
But this process has a dark side. Darth Vader and Lord Voldemort do not exist in our world, but there are certainly people who wish us harm—and, as the story of Anakin Skywalker so well reveals, there’s a shadow-self inside all of us that is capable of wishing harm on someone else.
A spike in cortisol can make us aggressive—one half of the “fight-or-flight” response we hear so much about—and oxytocin has been implicated in
competition between groups. People dosed with oxytocin in the lab show strong preferences for their own in-groups, however defined, from school bands to fraternities. Oxytocin appears to play a role in trying to take what out-groups have. People dosed with oxytocin are also more likely to indulge in group-think—going along with collective decisions even when they believe those decisions are wrong.

In short, stories form groups, a process enabled by oxytocin. It is no accident that communities—fandoms—have sprung up around Harry Potter and Star Wars, sometimes in (mostly) playful competition with each other. It’s harmless fun for fans, but not all stories are as benign as these, in intent or outcomes. Stories can carry us toward ideals that are destructive, especially to out-groups. Stories are a form of power over bodies, but it’s a power that we can use or misuse.

Take a look at this video, below, contrasting the speeches of two political leaders—both expert communicators—about the nuclear bombing of Hiroshima. And as you watch the video, think about their intentions. What emotions are they aiming to stir in their audiences? What kind of emotions do they trigger in you?

I’m not trying (here, at least) to tell you who to vote for in November. But given the power of stories, it’s dangerous to hear them without asking ourselves what reactions they are triggering in our bodies. Mr. Trump’s speech causes my stomach to clench and my mouth to go dry; in asking me to put my own group ahead of others, he triggers anger and anxiety. I believe that’s his intent. President Obama’s speech urges me to reflect and to think compassionately about all of humanity. His words lift my heart, just a bit—and, again, I believe that’s intentional.

I can feel their words in my body, but I’m not helpless against them. Research also suggests that people are more than capable of defending themselves against the power of stories. We can cognitively override the emotional identification and transportation stories trigger by trying to balance them against the facts. In cultivating awareness of the impact of a story, we can tell a different one, or revise the story to fit the facts or our own experience. We live in an story-saturated world—coming at us through screens as well as through pages and performances and music—and today, I think it’s essential for us to understand all the ways in which leaders and organizations are trying to manipulate us into believing what they want us to believe.

A lot of psychotherapy these days involves getting people to pay attention to the stories they tell themselves. In therapy, we are told to ask ourselves: Am I telling myself a story that helps me to grow and flourish, or is it one
that diminishes my life’s possibilities? We need to do the same to stories other people tell us. More than that, we need to look at our own responsibility for the well-being of others, and cultivate awareness of the impact of our own stories, of our own power over the bodies of other people. What intentions do we bring to the stories we tell? Are we using our power to lift people up and help them to see solutions to the problems we face as individuals and as groups? Or are we using our power to reveal the worst in ourselves, and so pit people against each other? Do we communicate things that make us feel good about ourselves—or that make us feel worse? Stories bring us together, but they can also tear us apart. They can bring us joy but they can also incite hatred. We are all born with the power to tell stories. It’s a power we need to learn to use well and wisely.

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