

TTC - How Memory Works and Why Your Brain Remembers Wrong

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Human memory is a process—a process situated in a dynamic and changing environment, moving across time, constantly updating our memories to serve us well in the current moment in order to help us thrive.

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Course Overview

“Who are you?” Chances are you’d answer this question by describing the highlights of your personality, interests, and life experiences. But if you’d been asked this same question yesterday, you might have responded with a slightly different description. Does that mean you are a particular person today but were a different person yesterday? And what about tomorrow?

Welcome to the slippery, shape-shifting nature of memory. As Professor Gabrielle Principe reveals in **How Memory Works and Why Your Brain Remembers Wrong**, “you” are the conglomeration of the often-unreliable information your brain decides to feed you at any given moment.

Over the course of these 12 fascinating lectures, you’ll come to understand why everything you experience in this life is an illusion—nothing more and nothing less than an interpretation of signals received, assembled, and reassembled over and over, and over again, by your brain. This might sound like the plot of a sci-fi thriller or a terrifying novel. But the pliability—and even unreliability—of your memory is no accident. Six hundred million years of evolution have brought you what you have today: the best memory for *Homo sapiens*. Yes, you hate it when you can’t remember where you put your car keys. But through this course, you’ll come to realize that each of the obvious negatives of your memory has a flip side that supports your ability to survive and thrive.

How Does Your Memory Go Wrong?

Many of us imagine our brains as video cameras, recording exactly what is seen and heard in its environment. That “video” is then labeled with a date and time and stored at a specific address in the brain—to be summoned and played back as a memory whenever you’d like. But that “video” concept is nothing like your real memory. Your life is a big stew of stimuli constantly bombarding your senses, a stew that your brain

turns into a seamless story of experience that makes sense. Our memories, and our lives, are the stories our brains make up for us. Far from being a recording device, memory is a process.

But sometimes our memories omit things that clearly happened, serve up recollections that don't square with the facts we previously experienced, or even manufacture events that never happened at all. What causes these issues that can result in such frustration?

In **How Memory Works and Why Your Brain Remembers Wrong**, Professor Principe explains three main causes of what we perceive to be memory “glitches”:

- **We miss most of what goes on around us.** Whenever we experience any event or phenomenon, we miss almost everything happening inside our bodies, most of what is happening in the distance, and even most of the things going on directly in front of us.
- **Only a fraction of what gets into our memories is retained.** Most of it fades or decays—some instantly and some later. But once it's gone, it's gone for good. And even among those memories that do make it in and stay, some become difficult or even impossible to retrieve.
- **When we recall a memory, we don't retrieve the original information.** We retrieve the fragments of fragments that remain, trying to reconstruct the totality of an experience. We are also prone to incorporate fragments that weren't even part of the original event.

The Real Problem of False Memories

While seeing *can* be believing, seeing also can be constructed completely inside our heads. You've probably experienced this phenomenon quite frequently.

For example, consider the last time you misplaced your phone. You can see it right there on your desk where you're so sure you placed it, and you have no memory of having tossed it on your bed an hour earlier. In this everyday example, you pick up your phone and go on about your business. But constructed, repressed, or false memories can be dangerous and life-altering. In fact, mistaken eyewitness identification is the number-one cause of wrongful convictions overturned by DNA evidence in the United States.

Adults and children both can create false memories, especially when they are pressured to come to a specific conclusion—whether by parents or by the detective who has a legal right to lie to the individual they're interrogating. In **How Memory Works and Why Your Brain Remembers Wrong**, you'll hear about:

- **The infamous case of preschool teacher Margaret Kelly Michaels.** After Michaels spent five years in prison for child abuse, her case was overturned when it became clear that all allegations of abuse were made only *after* the

children had been relentlessly questioned by police interviewers who believed that Michaels was guilty.

- **The case of Layla and the rabbit.** Using research carried out by Professor Principe in a memory experiment, you'll investigate how parents' beliefs can shape the way they question their children and consequently mold children's memories. You'll hear about 4-year-old Layla, whose account of a rabbit loose in her school was entertaining, highly detailed, and coherent—and completely untrue.
- **The case of Marty Tankleff, a teenager whose parents had been brutally stabbed in their own home.** For a variety of reasons that you'll learn about, Marty confessed to a crime he had not committed and spent 17 years in prison before being exonerated.

The Flip Side of Our Memory “Problems”

Our brains are crafted from the same types of cells that made up the very first simple nervous systems about 600 million years ago—neurons. And in those intervening years, evolution has not changed the neuron itself much at all. What *has* evolved is a *Homo sapiens* brain with 86 billion neurons, each of which is connected to about 5,000 other neurons. It's this massively complex system of 430 trillion connections that supports complex human behavior—including human memory.

In **How Memory Works and Why Your Brain Remembers Wrong**, you'll learn that each of our memory “problems,” actually, provides our species a pathway to survival and complex problem-solving. For example:

- **Forgetting helps make our cognition efficient and orderly.** One of the most important functions of our memory is to help us understand the present and make predictions about the future. Remembering every detail of every experience would prevent us from generalizing for new situations.
- **Forgetting guards our emotional health and sense of self.** Most people selectively forget negative experiences. That emphasis on the positive gives us a strong concept of ourselves and what we think we'll be capable of in the future.
- **Forgetting fosters creativity.** Forgetting allows us to let go of old memories, creating a space for new representations to form. If we kept every minute detail in our memory of how we did a particular activity, we wouldn't be able to “think outside the box”—which is so important for our growth as individuals and as our human community.

While we're all frustrated by our memory from time to time, it's exactly the malleability of it that makes us human. If our memories did record and play back every bit of the reality around us, we would be completely overwhelmed—and have a brain that was too big to hold up at the dinner table. With **How Memory Works and**

Why Your Brain Remembers Wrong, you will gain a greater appreciation for what you have, and what you sometimes forget, and the insights you're sure to remember.

12 Lectures

1The Surprising Pliability of Memory

2Context: The Connective Tissue of Memory

3Expectation, Perception, and Memory

4Attention: You Remember What You Notice

5False Memory: Remembering What Didn't Happen

6How Biases Distort What We Remember

7The Repressed Memory Wars

8Things You'll Forget and Why

9Memories of Emotional Experiences

10Changing Your Memories on Purpose

11Memory, Evidence, and the Law

12The Virtues of Misremembering