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THE HABIT LOOP How Habits Work

I.

In the fall of 1993, a man who would upend much of what we know about habits walked into a laboratory in San Diego for a scheduled appointment. He was elderly, a shade over six feet tall, and neatly dressed in a blue button-down shirt.^{1.1} His thick white hair would have inspired envy at any fiftieth high school reunion. Arthritis caused him to limp slightly as he paced the laboratory's hallways, and he held his wife's hand, walking slowly, as if unsure about what each new step would bring.

About a year earlier, Eugene Pauly, or "E.P." as he would come to be known in medical literature, had been at home in Playa del Rey, preparing for dinner, when his wife mentioned that their son, Michael, was coming over.

"Who's Michael?" Eugene asked.^{1.2}

"Your child," said his wife, Beverly. "You know, the one we raised?"

Eugene looked at her blankly. "Who is that?" he asked.

The next day, Eugene started vomiting and writhing with stomach cramps. Within twenty-four hours, his dehydration was so pronounced that a panicked Beverly took him to the emergency room. His temperature started rising, hitting 105 degrees as he sweated a yellow halo of perspiration onto the hospital's sheets. He

became delirious, then violent, yelling and pushing when nurses tried to insert an IV into his arm. Only after sedation was a physician able to slide a long needle between two vertebra in the small of his back and extract a few drops of cerebrospinal fluid.

The doctor performing the procedure sensed trouble immediately. The fluid surrounding the brain and spinal nerves is a barrier against infection and injury. In healthy individuals, it is clear and quick flowing, moving with an almost silky rush through a needle. The sample from Eugene's spine was cloudy and dripped out sluggishly, as if filled with microscopic grit.^{1.3} When the results came back from the laboratory, Eugene's physicians learned why he was ill: He was suffering from viral encephalitis, a disease caused by a relatively harmless virus that produces cold sores, fever blisters, and mild infections on the skin. In rare cases, however, the virus can make its way into the brain, inflicting catastrophic damage as it chews through the delicate folds of tissue where our thoughts, dreams—and according to some, souls—reside.

Eugene's doctors told Beverly there was nothing they could do to counter the damage already done, but a large dose of antiviral drugs might prevent it from spreading. Eugene slipped into a coma and for ten days was close to death. Gradually, as the drugs fought the disease, his fever receded and the virus disappeared. When he finally awoke, he was weak and disoriented and couldn't swallow properly. He couldn't form sentences and would sometimes gasp, as if he had momentarily forgotten how to breathe. But he was alive.

Eventually, Eugene was well enough for a battery of tests. The doctors were amazed to find that his body—including his nervous system—appeared largely unscathed. He could move his limbs and was responsive to noise and light. Scans of his head, though, revealed ominous shadows near the center of his brain. The virus had destroyed an oval of tissue close to where his cranium and spinal column met. "He might not be the person you remember," one doctor warned Beverly. "You need to be ready if your husband is gone."

Eugene was moved to a different wing of the hospital. Within a week, he was swallowing easily. Another week, and he started

talking normally, asking for Jell-O and salt, flipping through television channels and complaining about boring soap operas. By the time he was discharged to a rehabilitation center five weeks later, Eugene was walking down hallways and offering nurses unsolicited advice about their weekend plans.

“I don’t think I’ve ever seen anyone come back like this,” a doctor told Beverly. “I don’t want to raise your hopes, but this is amazing.”

Beverly, however, remained concerned. In the rehab hospital it became clear that the disease had changed her husband in unsettling ways. Eugene couldn’t remember which day of the week it was, for instance, or the names of his doctors and nurses, no matter how many times they introduced themselves. “Why do they keep asking me all these questions?” he asked Beverly one day after a physician left his room. When he finally returned home, things got even stranger. Eugene didn’t seem to remember their friends. He had trouble following conversations. Some mornings, he would get out of bed, walk into the kitchen, cook himself bacon and eggs, then climb back under the covers and turn on the radio. Forty minutes later, he would do the same thing: get up, cook bacon and eggs, climb back into bed, and fiddle with the radio. Then he would do it again.

Alarmed, Beverly reached out to specialists, including a researcher at the University of California, San Diego, who specialized in memory loss. Which is how, on a sunny fall day, Beverly and Eugene found themselves in a nondescript building on the university’s campus, holding hands as they walked slowly down a hallway. They were shown into a small exam room. Eugene began chatting with a young woman who was using a computer.

“Having been in electronics over the years, I’m amazed at all this,” he said, gesturing at the machine she was typing on. “When I was younger, that thing would have been in a couple of six-foot racks and taken up this whole room.”

The woman continued pecking at the keyboard. Eugene chuckled.

“That is incredible,” he said. “All those printed circuits and diodes and triodes. When I was in electronics, there would have been a couple of six-foot racks holding that thing.”

A scientist entered the room and introduced himself. He asked Eugene how old he was.

“Oh, let’s see, fifty-nine or sixty?” Eugene replied. He was seventy-one years old.

The scientist started typing on the computer. Eugene smiled and pointed at it. “That is really something,” he said. “You know, when I was in electronics there would have been a couple of six-foot racks holding that thing!”

The scientist was fifty-two-year-old Larry Squire, a professor who had spent the past three decades studying the neuroanatomy of memory. His specialty was exploring how the brain stores events. His work with Eugene, however, would soon open a new world to him and hundreds of other researchers who have reshaped our understanding of how habits function. Squire’s studies would show that even someone who can’t remember his own age or almost anything else can develop habits that seem inconceivably complex—until you realize that everyone relies on similar neurological processes every day. His and others’ research would help reveal the subconscious mechanisms that impact the countless choices that seem as if they’re the products of well-reasoned thought, but actually are influenced by urges most of us barely recognize or understand.

By the time Squire met Eugene, he had already been studying images of his brain for weeks. The scans indicated that almost all the damage within Eugene’s skull was limited to a five-centimeter area near the center of his head. The virus had almost entirely destroyed his medial temporal lobe, a sliver of cells which scientists suspected was responsible for all sorts of cognitive tasks such as recall of the past and the regulation of some emotions. The completeness of the destruction didn’t surprise Squire—viral encephalitis consumes tissue with a ruthless, almost surgical, precision. What shocked him was how familiar the images seemed.

Thirty years earlier, as a PhD student at MIT, Squire had worked alongside a group studying a man known as “H.M.,” one of the most famous patients in medical history. When H.M.—his real name was Henry Molaison, but scientists shrouded his identity throughout his

life—was seven years old, he was hit by a bicycle and landed hard on his head.^{1.4,1.5,1.6} Soon afterward, he developed seizures and started blacking out. At sixteen, he had his first grand mal seizure, the kind that affects the entire brain; soon, he was losing consciousness up to ten times a day.

By the time he turned twenty-seven, H.M. was desperate. Anticonvulsive drugs hadn't helped. He was smart, but couldn't hold a job.^{1.7} He still lived with his parents. H.M. wanted a normal existence. So he sought help from a physician whose tolerance for experimentation outweighed his fear of malpractice. Studies had suggested that an area of the brain called the hippocampus might play a role in seizures. When the doctor proposed cutting into H.M.'s head, lifting up the front portion of his brain, and, with a small straw, sucking out the hippocampus and some surrounding tissue from the interior of his skull, H.M.^{1.8,1.9} gave his consent.

The surgery occurred in 1953, and as H.M. healed, his seizures slowed. Almost immediately, however, it became clear that his brain had been radically altered. H.M. knew his name and that his mother was from Ireland. He could remember the 1929 stock market crash and news reports about the invasion of Normandy. But almost everything that came afterward—all the memories, experiences, and struggles from most of the decade before his surgery—had been erased. When a doctor began testing H.M.'s memory by showing him playing cards and lists of numbers, he discovered that H.M. couldn't retain any new information for more than twenty seconds or so.

From the day of his surgery until his death in 2008, every person H.M. met, every song he heard, every room he entered, was a completely fresh experience. His brain was frozen in time. Each day, he was befuddled by the fact that someone could change the television channel by pointing a black rectangle of plastic at the screen. He introduced himself to his doctors and nurses over and over, dozens of times each day.^{1.10}

"I loved learning about H.M., because memory seemed like such a tangible, exciting way to study the brain," Squire told me. "I grew up in Ohio, and I can remember, in first grade, my teacher handing

everyone crayons, and I started mixing all the colors together to see if it would make black. Why have I kept that memory, but I can't remember what my teacher looked like? Why does my brain decide that one memory is more important than another?"

When Squire received the images of Eugene's brain, he marveled at how similar it seemed to H.M.'s. There were empty, walnut-sized chunks in the middle of both their heads. Eugene's memory—just like H.M.'s—had been removed.

As Squire began examining Eugene, though, he saw that this patient was different from H.M. in some profound ways. Whereas almost everyone knew within minutes of meeting H.M. that something was amiss, Eugene could carry on conversations and perform tasks that wouldn't alert a casual observer that anything was wrong. The effects of H.M.'s surgery had been so debilitating that he was institutionalized for the remainder of his life. Eugene, on the other hand, lived at home with his wife. H.M. couldn't really carry on conversations. Eugene, in contrast, had an amazing knack for guiding almost any discussion to a topic he was comfortable talking about at length, such as satellites—he had worked as a technician for an aerospace company—or the weather.

Squire started his exam of Eugene by asking him about his youth. Eugene talked about the town where he had grown up in central California, his time in the merchant marines, a trip he had taken to Australia as a young man. He could remember most of the events in his life that had occurred prior to about 1960. When Squire asked about later decades, Eugene politely changed the topic and said he had trouble recollecting some recent events.

Squire conducted a few intelligence tests and found that Eugene's intellect was still sharp for a man who couldn't remember the last three decades. What's more, Eugene still had all the habits he had formed in his youth, so whenever Squire gave him a cup of water or complimented him on a particularly detailed answer, Eugene would thank him and offer a compliment in return. Whenever someone entered the room, Eugene would introduce himself and ask about their day.

But when Squire asked Eugene to memorize a string of numbers or describe the hallway outside the laboratory's door, the doctor found his patient couldn't retain any new information for more than a minute or so. When someone showed Eugene photos of his grandchildren, he had no idea who they were. When Squire asked if he remembered getting sick, Eugene said he had no recollection of his illness or the hospital stay. In fact, Eugene almost never recalled that he was suffering from amnesia. His mental image of himself didn't include memory loss, and since he couldn't remember the injury, he couldn't conceive of anything being wrong.

In the months after meeting Eugene, Squire conducted experiments that tested the limits of his memory. By then, Eugene and Beverly had moved from Playa del Rey to San Diego to be closer to their daughter, and Squire often visited their home for his exams. One day, Squire asked Eugene to sketch a layout of his house. Eugene couldn't draw a rudimentary map showing where the kitchen or bedroom was located. "When you get out of bed in the morning, how do you leave your room?" Squire asked.

"You know," Eugene said, "I'm not really sure."

Squire took notes on his laptop, and as the scientist typed, Eugene became distracted. He glanced across the room and then stood up, walked into a hallway, and opened the door to the bathroom. A few minutes later, the toilet flushed, the faucet ran, and Eugene, wiping his hands on his pants, walked back into the living room and sat down again in his chair next to Squire. He waited patiently for the next question.

At the time, no one wondered how a man who couldn't draw a map of his home was able to find the bathroom without hesitation. But that question, and others like it, would eventually lead to a trail of discoveries that has transformed our understanding of habits' power.^{1.11} It would help spark a scientific revolution that today involves hundreds of researchers who are learning, for the first time, to understand all the habits that influence our lives.

As Eugene sat at the table, he looked at Squire's laptop.

"That's amazing," he said, gesturing at the computer. "You know, when I was in electronics, there would have been a couple of six-

foot racks holding that thing.”



In the first few weeks after they moved into their new house, Beverly tried to take Eugene outside each day. The doctors had told her that it was important for him to get exercise, and if Eugene was inside too long he drove Beverly crazy, asking her the same questions over and over in an endless loop. So each morning and afternoon, she took him on a walk around the block, always together and always along the same route.

The doctors had warned Beverly that she would need to monitor Eugene constantly. If he ever got lost, they said, he would never be able to find his way home. But one morning, while she was getting dressed, Eugene slipped out the front door. He had a tendency to wander from room to room, so it took her a while to notice he was gone. When she did, she became frantic. She ran outside and scanned the street. She couldn't see him. She went to the neighbors' house and pounded on the windows. Their homes looked similar—maybe Eugene had become confused and had gone inside? She ran to the door and rang the bell until someone answered. Eugene wasn't there. She sprinted back to the street, running up the block, screaming Eugene's name. She was crying. What if he had wandered into traffic? How would he tell anyone where he lived? She had been outside for fifteen minutes already, looking everywhere. She ran home to call the police.

When she burst through the door, she found Eugene in the living room, sitting in front of the television watching the History Channel. Her tears confused him. He didn't remember leaving, he said, didn't know where he'd been, and couldn't understand why she was so upset. Then Beverly saw a pile of pinecones on the table, like the ones she'd seen in a neighbor's yard down the street. She came closer and looked at Eugene's hands. His fingers were sticky with sap. That's when she realized that Eugene had gone for a walk by himself. He had wandered down the street and collected some souvenirs.

And he had found his way home.

Soon, Eugene was going for walks every morning. Beverly tried to stop him, but it was pointless.

“Even if I told him to stay inside, he wouldn’t remember a few minutes later,” she told me. “I followed him a few times to make sure he wouldn’t get lost, but he always came back.” Sometimes he would return with pinecones or rocks. Once he came back with a wallet; another time with a puppy. He never remembered where they came from.

When Squire and his assistants heard about these walks, they started to suspect that something was happening inside Eugene’s head that didn’t have anything to do with his conscious memory. They designed an experiment. One of Squire’s assistants visited the house one day and asked Eugene to draw a map of the block where he lived. He couldn’t do it. How about where his house was located on the street, she asked. He doodled a bit, then forgot the assignment. She asked him to point out which doorway led to the kitchen. Eugene looked around the room. He didn’t know, he said. She asked Eugene what he would do if he were hungry. He stood up, walked into the kitchen, opened a cabinet, and took down a jar of nuts.

Later that week, a visitor joined Eugene on his daily stroll. They walked for about fifteen minutes through the perpetual spring of Southern California, the scent of bougainvillea heavy in the air. Eugene didn’t say much, but he always led the way and seemed to know where he was going. He never asked for directions. As they rounded the corner near his house, the visitor asked Eugene where he lived. “I don’t know, exactly,” he said. Then he walked up his sidewalk, opened his front door, went into the living room, and turned on the television.

It was clear to Squire that Eugene was absorbing new information. But where inside his brain was that information residing? How could someone find a jar of nuts when he couldn’t say where the kitchen was located? Or find his way home when he had no idea which house was his? How, Squire wondered, were new patterns forming inside Eugene’s damaged brain?

II.

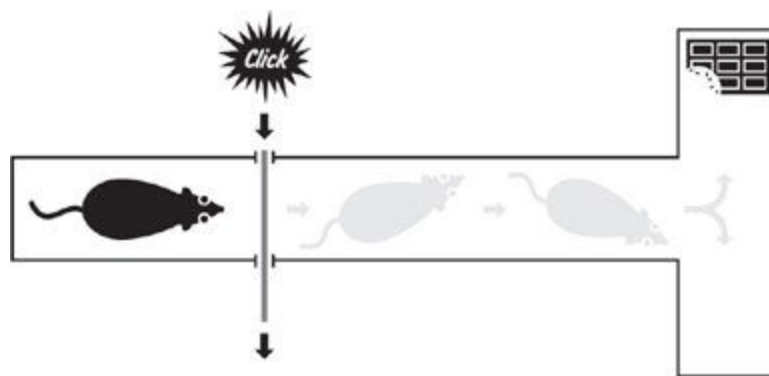
Within the building that houses the Brain and Cognitive Sciences department of the Massachusetts Institute of Technology are laboratories that contain what, to the casual observer, look like dollhouse versions of surgical theaters. There are tiny scalpels, small drills, and miniature saws less than a quarter inch wide attached to robotic arms. Even the operating tables are tiny, as if prepared for child-sized surgeons. The rooms are always kept at a chilly sixty degrees because a slight nip in the air steadies researchers' fingers during delicate procedures. Inside these laboratories, neurologists cut into the skulls of anesthetized rats, implanting tiny sensors that can record the smallest changes inside their brains. When the rats wake, they hardly seem to notice that there are now dozens of microscopic wires arrayed, like neurological spider webs, inside their heads.

These laboratories have become the epicenter for a quiet revolution in the science of habit formation, and the experiments unfolding here explain how Eugene—as well as you, me, and everyone else—developed the behaviors necessary to make it through each day. The rats in these labs have illuminated the complexity that occurs inside our heads whenever we do something as mundane as brush our teeth or back the car out of the driveway. And for Squire, these laboratories helped explain how Eugene managed to learn new habits.

When the MIT researchers started working on habits in the 1990s—at about the same time that Eugene came down with his fever—they were curious about a nub of neurological tissue known as the basal ganglia. If you picture the human brain as an onion, composed of layer upon layer of cells, then the outside layers—those closest to the scalp—are generally the most recent additions from an evolutionary perspective. When you dream up a new invention or laugh at a friend's joke, it's the outside parts of your brain at work. That's where the most complex thinking occurs.

Deeper inside the brain and closer to the brain stem—where the brain meets the spinal column—are older, more primitive structures. They control our automatic behaviors, such as breathing and swallowing, or the startle response we feel when someone leaps out from behind a bush. Toward the center of the skull is a golf ball-sized lump of tissue that is similar to what you might find inside the head of a fish, reptile, or mammal.^{1.12} This is the basal ganglia, an oval of cells that, for years, scientists didn't understand very well, except for suspicions that it played a role in diseases such as Parkinson's.^{1.13,1.14}

In the early 1990s, the MIT researchers began wondering if the basal ganglia might be integral to habits as well. They noticed that animals with injured basal ganglia suddenly developed problems with tasks such as learning how to run through mazes or remembering how to open food containers.^{1.15} They decided to experiment by employing new micro-technologies that allowed them to observe, in minute detail, what was occurring within the heads of rats as they performed dozens of routines. In surgery, each rat had what looked like a small joystick and dozens of tiny wires inserted into its skull. Afterward, the animal was placed into a T-shaped maze with chocolate at one end.



The maze was structured so that each rat was positioned behind a partition that opened when a loud click sounded.^{1.16} Initially, when a rat heard the click and saw the partition disappear, it would usually wander up and down the center aisle, sniffing in corners and scratching at walls. It appeared to smell the chocolate, but couldn't

figure out how to find it. When it reached the top of the T, it often turned to the right, away from the chocolate, and then wandered left, sometimes pausing for no obvious reason. Eventually, most animals discovered the reward. But there was no discernible pattern in their meanderings. It seemed as if each rat was taking a leisurely, unthinking stroll.

The probes in the rats' heads, however, told a different story. While each animal wandered through the maze, its brain—and in particular, its basal ganglia—worked furiously. Each time a rat sniffed the air or scratched a wall, its brain exploded with activity, as if analyzing each new scent, sight, and sound. The rat was processing information the entire time it meandered.

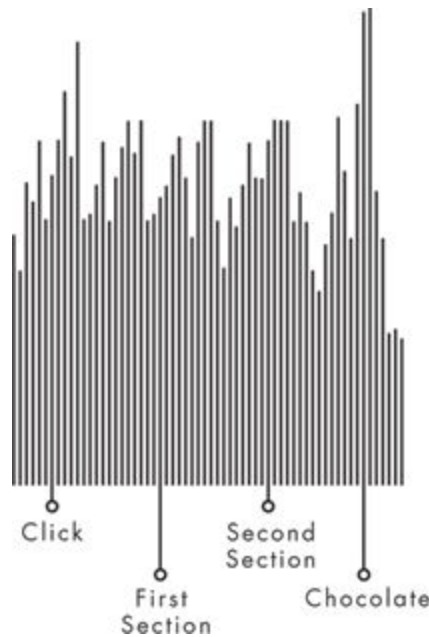
The scientists repeated their experiment, again and again, watching how each rat's brain activity changed as it moved through the same route hundreds of times. A series of shifts slowly emerged. The rats stopped sniffing corners and making wrong turns. Instead, they zipped through the maze faster and faster. And within their brains, something unexpected occurred: As each rat learned how to navigate the maze, its mental activity *decreased*. As the route became more and more automatic, each rat started thinking less and less.

It was as if the first few times a rat explored the maze, its brain had to work at full power to make sense of all the new information. But after a few days of running the same route, the rat didn't need to scratch the walls or smell the air anymore, and so the brain activity associated with scratching and smelling ceased. It didn't need to choose which direction to turn, and so decision-making centers of the brain went quiet. All it had to do was recall the quickest path to the chocolate. Within a week, even the brain structures related to memory had quieted. The rat had internalized how to sprint through the maze to such a degree that it hardly needed to think at all.

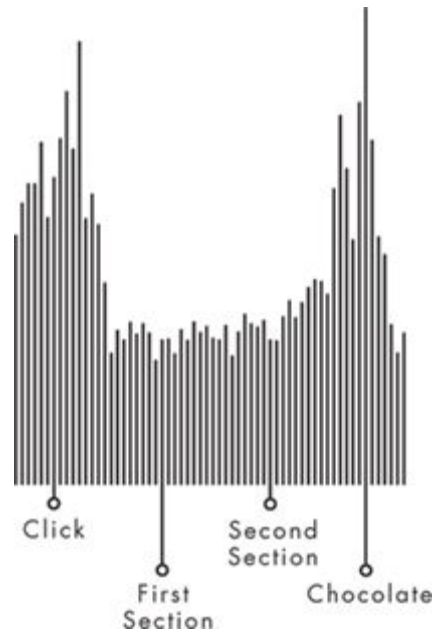
But that internalization—run straight, hang a left, eat the chocolate—relied upon the basal ganglia, the brain probes indicated. This tiny, ancient neurological structure seemed to take over as the rat ran faster and faster and its brain worked less and

less. The basal ganglia was central to recalling patterns and acting on them. The basal ganglia, in other words, stored habits even while the rest of the brain went to sleep.

To see this capacity in action, consider this graph, which shows activity within a rat's skull as it encounters the maze for the first time.^{1.17} Initially, the brain is working hard the entire time:



After a week, once the route is familiar and the scurrying has become a habit, the rat's brain settles down as it runs through the maze:



This process—in which the brain converts a sequence of actions into an automatic routine—is known as “chunking,” and it’s at the root of how habits form.^{1.18} There are dozens—if not hundreds—of behavioral chunks that we rely on every day. Some are simple: You automatically put toothpaste on your toothbrush before sticking it in your mouth. Some, such as getting dressed or making the kids’ lunch, are a little more complex.

Others are so complicated that it’s remarkable a small bit of tissue that evolved millions of years ago can turn them into habits at all. Take the act of backing your car out of the driveway. When you first learned to drive, the driveway required a major dose of concentration, and for good reason: It involves opening the garage, unlocking the car door, adjusting the seat, inserting the key in the ignition, turning it clockwise, moving the rearview and side mirrors and checking for obstacles, putting your foot on the brake, moving the gearshift into reverse, removing your foot from the brake, mentally estimating the distance between the garage and the street while keeping the wheels aligned and monitoring for oncoming traffic, calculating how reflected images in the mirrors translate into actual distances between the bumper, the garbage cans, and the hedges, all while applying slight pressure to the gas pedal and

brake, and, most likely, telling your passenger to please stop fiddling with the radio.

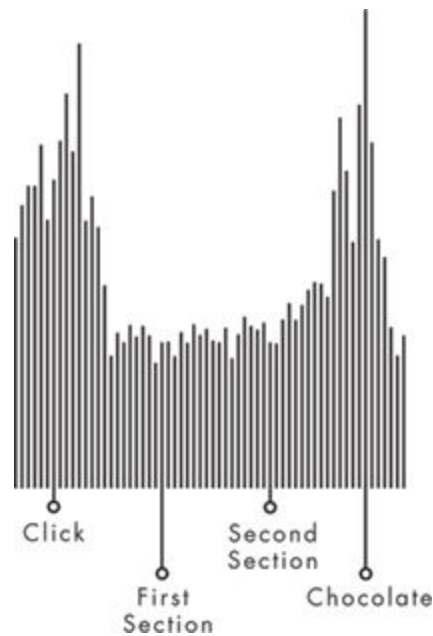
Nowadays, however, you do all of that every time you pull onto the street with hardly any thought. The routine occurs by habit.

Millions of people perform this intricate ballet every morning, unthinkingly, because as soon as we pull out the car keys, our basal ganglia kicks in, identifying the habit we've stored in our brains related to backing an automobile into the street. Once that habit starts unfolding, our gray matter is free to quiet itself or chase other thoughts, which is why we have enough mental capacity to realize that Jimmy forgot his lunchbox inside.

Habits, scientists say, emerge because the brain is constantly looking for ways to save effort. Left to its own devices, the brain will try to make almost any routine into a habit, because habits allow our minds to ramp down more often. This effort-saving instinct is a huge advantage. An efficient brain requires less room, which makes for a smaller head, which makes childbirth easier and therefore causes fewer infant and mother deaths. An efficient brain also allows us to stop thinking constantly about basic behaviors, such as walking and choosing what to eat, so we can devote mental energy to inventing spears, irrigation systems, and, eventually, airplanes and video games.

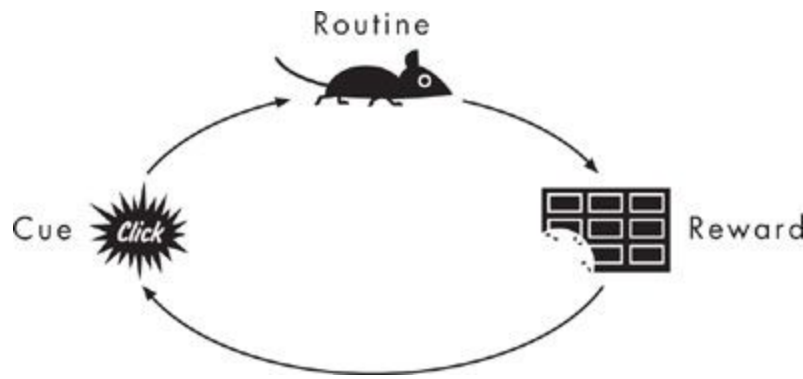
But conserving mental effort is tricky, because if our brains power down at the wrong moment, we might fail to notice something important, such as a predator hiding in the bushes or a speeding car as we pull onto the street. So our basal ganglia have devised a clever system to determine when to let habits take over. It's something that happens whenever a chunk of behavior starts or ends.

To see how it works, look closely at the graph of the rat's neurological habit again. Notice that brain activity spikes at the beginning of the maze, when the rat hears the click before the partition starts moving, and again at the end, when it finds the chocolate.



Those spikes are the brain's way of determining when to cede control to a habit, and which habit to use. From behind a partition, for instance, it's difficult for a rat to know if it's inside a familiar maze or an unfamiliar cupboard with a cat lurking outside. To deal with this uncertainty, the brain spends a lot of effort at the beginning of a habit looking for something—a cue—that offers a hint as to which pattern to use. From behind a partition, if a rat hears a click, it knows to use the maze habit. If it hears a meow, it chooses a different pattern. And at the end of the activity, when the reward appears, the brain shakes itself awake and makes sure everything unfolded as expected.

This process within our brains is a three-step loop. First, there is a *cue*, a trigger that tells your brain to go into automatic mode and which habit to use. Then there is the *routine*, which can be physical or mental or emotional. Finally, there is a *reward*, which helps your brain figure out if this particular loop is worth remembering for the future:



THE HABIT LOOP

Over time, this loop—cue, routine, reward; cue, routine, reward—becomes more and more automatic. The cue and reward become intertwined until a powerful sense of anticipation and craving emerges. Eventually, whether in a chilly MIT laboratory or your driveway, a habit is born.^{1.19}



Habits aren't destiny. As the next two chapters explain, habits can be ignored, changed, or replaced. But the reason the discovery of the habit loop is so important is that it reveals a basic truth: When a habit emerges, the brain stops fully participating in decision making. It stops working so hard, or diverts focus to other tasks. So unless you deliberately *fight* a habit—unless you find new routines—the pattern will unfold automatically.

However, simply understanding how habits work—learning the structure of the habit loop—makes them easier to control. Once you break a habit into its components, you can fiddle with the gears.

“We’ve done experiments where we trained rats to run down a maze until it was a habit, and then we extinguished the habit by changing the placement of the reward,” Ann Graybiel, a scientist at MIT who oversaw many of the basal ganglia experiments, told me. “Then one day, we’ll put the reward in the old place, and put in the rat, and, by golly, the old habit will reemerge right away. Habits never really disappear. They’re encoded into the structures of our

brain, and that's a huge advantage for us, because it would be awful if we had to relearn how to drive after every vacation. The problem is that your brain can't tell the difference between bad and good habits, and so if you have a bad one, it's always lurking there, waiting for the right cues and rewards."^{1.20}

This explains why it's so hard to create exercise habits, for instance, or change what we eat. Once we develop a routine of sitting on the couch, rather than running, or snacking whenever we pass a doughnut box, those patterns always remain inside our heads. By the same rule, though, if we learn to create new neurological routines that overpower those behaviors—if we take control of the habit loop—we can force those bad tendencies into the background, just as Lisa Allen did after her Cairo trip. And once someone creates a new pattern, studies have demonstrated, going for a jog or ignoring the doughnuts becomes as automatic as any other habit.

Without habit loops, our brains would shut down, overwhelmed by the minutiae of daily life. People whose basal ganglia are damaged by injury or disease often become mentally paralyzed. They have trouble performing basic activities, such as opening a door or deciding what to eat. They lose the ability to ignore insignificant details—one study, for example, found that patients with basal ganglia injuries couldn't recognize facial expressions, including fear and disgust, because they were perpetually uncertain about which part of the face to focus on. Without our basal ganglia, we lose access to the hundreds of habits we rely on every day. Did you pause this morning to decide whether to tie your left or right shoe first? Did you have trouble figuring out if you should brush your teeth before or after you showered?

Of course not. Those decisions are habitual, effortless. As long as your basal ganglia is intact and the cues remain constant, the behaviors will occur unthinkingly. (Though when you go on vacation, you may get dressed in different ways or brush your teeth at a different point in your morning routine without noticing it.)

At the same time, however, the brain's dependence on automatic routines can be dangerous. Habits are often as much a curse as a benefit.

Take Eugene, for instance. Habits gave him his life back after he lost his memory. Then they took everything away again.

III.

As Larry Squire, the memory specialist, spent more and more time with Eugene, he became convinced his patient was somehow learning new behaviors. Images of Eugene's brain showed that his basal ganglia had escaped injury from the viral encephalitis. Was it possible, the scientist wondered, that Eugene, even with severe brain damage, could still use the cue-routine-reward loop? Could this ancient neurological process explain how Eugene was able to walk around the block and find the jar of nuts in the kitchen?

To test if Eugene was forming new habits, Squire devised an experiment. He took sixteen different objects—bits of plastic and brightly colored pieces of toys—and glued them to cardboard rectangles. He then divided them into eight pairs: choice A and choice B. In each pairing, one piece of cardboard, chosen at random, had a sticker placed on the bottom that read “correct.”^{1.21}

Eugene was seated at a table, given a pair of objects, and asked to choose one. Next, he was told to turn over his choice to see if there was a “correct” sticker underneath. This is a common way to measure memory. Since there are only sixteen objects, and they are always presented in the same eight pairings, most people can memorize which item is “correct” after a few rounds. Monkeys can memorize all the “correct” items after eight to ten days.

Eugene couldn't remember any of the “correct” items, no matter how many times he did the test. He repeated the experiment twice a week for months, looking at forty pairings each day.

“Do you know why you are here today?” a researcher asked at the beginning of one session a few weeks into the experiment.

“I don't think so,” Eugene said.

“I'm going to show you some objects. Do you know why?”

“Am I supposed to describe them to you, or tell you what they are used for?” Eugene couldn't recollect the previous sessions at all.

But as the weeks passed, Eugene's performance improved. After twenty-eight days of training, Eugene was choosing the “correct”

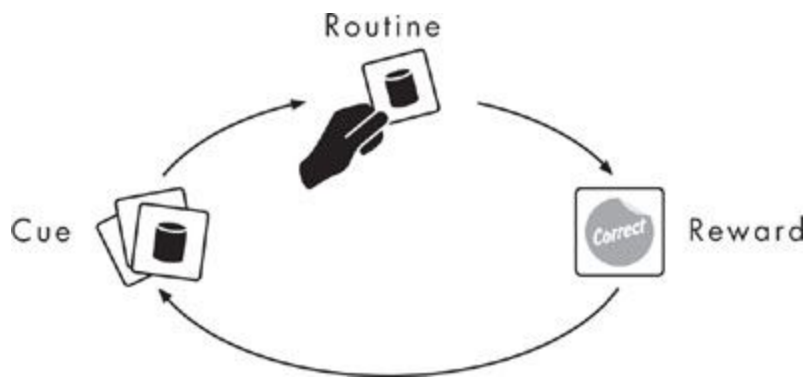
object 85 percent of the time. At thirty-six days, he was right 95 percent of the time. After one test, Eugene looked at the researcher, bewildered by his success.

“How am I doing this?” he asked her.

“Tell me what is going on in your head,” the researcher said. “Do you say to yourself, ‘I remember seeing that one’?”

“No,” Eugene said. “It’s here somehow or another”—he pointed to his head—“and the hand goes for it.”

To Squire, however, it made perfect sense. Eugene was exposed to a cue: a pair of objects always presented in the same combination. There was a routine: He would choose one object and look to see if there was a sticker underneath, even if he had no idea why he felt compelled to turn the cardboard over. Then there was a reward: the satisfaction he received after finding a sticker proclaiming “correct.” Eventually, a habit loop emerged.



EUGENE’S HABIT LOOP

To make sure this pattern was, in fact, a habit, Squire conducted one more experiment. He took all sixteen items and put them in front of Eugene at the same time. He asked him to put all the “correct” objects into one pile.

Eugene had no idea where to begin. “Gosh sakes, how to remember this?” he asked. He reached for one object and started to turn it over. The experimenter stopped him. No, she explained. The task was to put the items in *piles*. Why was he trying to turn them over?

“That’s just a habit, I think,” he said.

He couldn’t do it. The objects, when presented outside of the context of the habit loop, made no sense to him.

Here was the proof Squire was looking for. The experiments demonstrated that Eugene had the ability to form new habits, even when they involved tasks or objects he couldn’t remember for more than a few seconds. This explained how Eugene managed to go for a walk every morning. The cues—certain trees on corners or the placement of particular mailboxes—were consistent every time he went outside, so though he couldn’t recognize his house, his habits always guided him back to his front door. It also explained why Eugene would eat breakfast three or four times a day, even if he wasn’t hungry. As long as the right cues were present—such as his radio or the morning light through his windows—he automatically followed the script dictated by his basal ganglia.

What’s more, there were dozens of other habits in Eugene’s life that no one noticed until they started looking for them. Eugene’s daughter, for instance, would often stop by his house to say hello. She would talk to her father in the living room for a bit, then go into the kitchen to visit with her mother, and then leave, waving good-bye on her way out the door. Eugene, who had forgotten their earlier conversation by the time she left, would get angry—why was she leaving without chatting?—and then forget why he was upset. But the emotional habit had already started, and so his anger would persist, red hot and beyond his understanding, until it burned itself out.

“Sometimes he would bang the table or curse, and if you asked him why, he’d say ‘I don’t know, but I’m mad!’ ” Beverly told me. He would kick his chair, or snap at whoever came into the room. Then, a few minutes later, he would smile and talk about the weather. “It was like, once it started, he had to finish the frustration,” she said.

Squire’s new experiment also showed something else: that habits are surprisingly delicate. If Eugene’s cues changed the slightest bit, his habits fell apart. The few times he walked around the block, for instance, and something was different—the city was doing street

repairs or a windstorm had blown branches all over the sidewalk—Eugene would get lost, no matter how close he was to home, until a kind neighbor showed him the way to his door. If his daughter stopped to chat with him for ten seconds before she walked out, his anger habit never emerged.

Squire's experiments with Eugene revolutionized the scientific community's understanding of how the brain works by proving, once and for all, that it's possible to learn and make unconscious choices without remembering anything about the lesson or decision making.^{1.22} Eugene showed that habits, as much as memory and reason, are at the root of how we behave. We might not remember the experiences that create our habits, but once they are lodged within our brains they influence how we act—often without our realization.



Since Squire's first paper on Eugene's habits was published, the science of habit formation has exploded into a major field of study. Researchers at Duke, Harvard, UCLA, Yale, USC, Princeton, the University of Pennsylvania, and at schools in the United Kingdom, Germany, and the Netherlands, as well as corporate scientists working for Procter & Gamble, Microsoft, Google, and hundreds of other companies are focused on understanding the neurology and psychology of habits, their strengths and weaknesses, and why they emerge and how they can be changed.

Researchers have learned that cues can be almost anything, from a visual trigger such as a candy bar or a television commercial to a certain place, a time of day, an emotion, a sequence of thoughts, or the company of particular people. Routines can be incredibly complex or fantastically simple (some habits, such as those related to emotions, are measured in milliseconds). Rewards can range from food or drugs that cause physical sensations, to emotional payoffs, such as the feelings of pride that accompany praise or self-congratulation.

And in almost every experiment, researchers have seen echoes of Squire's discoveries with Eugene: Habits are powerful, but delicate. They can emerge outside our consciousness, or can be deliberately designed. They often occur without our permission, but can be reshaped by fiddling with their parts. They shape our lives far more than we realize—they are so strong, in fact, that they cause our brains to cling to them at the exclusion of all else, including common sense.

In one set of experiments, for example, researchers affiliated with the National Institute on Alcohol Abuse and Alcoholism trained mice to press levers in response to certain cues until the behavior became a habit. The mice were always rewarded with food. Then, the scientists poisoned the food so that it made the animals violently ill, or electrified the floor, so that when the mice walked toward their reward they received a shock. The mice knew the food and cage were dangerous—when they were offered the poisoned pellets in a bowl or saw the electrified floor panels, they stayed away. When they saw their old cues, however, they unthinkingly pressed the lever and ate the food, or they walked across the floor, even as they vomited or jumped from the electricity. The habit was so ingrained the mice couldn't stop themselves.^{1.23}

It's not hard to find an analog in the human world. Consider fast food, for instance. It makes sense—when the kids are starving and you're driving home after a long day—to stop, just this once, at McDonald's or Burger King. The meals are inexpensive. It tastes so good. After all, one dose of processed meat, salty fries, and sugary soda poses a relatively small health risk, right? It's not like you do it all the time.

But habits emerge without our permission. Studies indicate that families usually don't *intend* to eat fast food on a regular basis. What happens is that a once a month pattern slowly becomes once a week, and then twice a week—as the cues and rewards create a habit—until the kids are consuming an unhealthy amount of hamburgers and fries. When researchers at the University of North Texas and Yale tried to understand why families gradually increased their fast food consumption, they found a series of cues and rewards

that most customers never knew were influencing their behaviors.^{1.24} They discovered the habit loop.

Every McDonald's, for instance, looks the same—the company deliberately tries to standardize stores' architecture and what employees say to customers, so everything is a consistent cue to trigger eating routines. The foods at some chains are specifically engineered to deliver immediate rewards—the fries, for instance, are designed to begin disintegrating the moment they hit your tongue, in order to deliver a hit of salt and grease as fast as possible, causing your pleasure centers to light up and your brain to lock in the pattern. All the better for tightening the habit loop.^{1.25}

However, even these habits are delicate. When a fast food restaurant closes down, the families that previously ate there will often start having dinner at home, rather than seek out an alternative location. Even small shifts can end the pattern. But since we often don't recognize these habit loops as they grow, we are blind to our ability to control them. By learning to observe the cues and rewards, though, we can change the routines.

IV.

By 2000, seven years after Eugene's illness, his life had achieved a kind of equilibrium. He went for a walk every morning. He ate what he wanted, sometimes five or six times a day. His wife knew that as long as the television was tuned to the History Channel, Eugene would settle into his plush chair and watch it regardless of whether it was airing reruns or new programs. He couldn't tell the difference.

As he got older, however, Eugene's habits started impacting his life in negative ways. He was sedentary, sometimes watching television for hours at a time because he never grew bored with the shows. His physicians became worried about his heart. The doctors told Beverly to keep him on a strict diet of healthy foods. She tried, but it was difficult to influence how frequently he ate or what he consumed. He never recalled her admonitions. Even if the refrigerator was stocked with fruits and vegetables, Eugene would root around until he found the bacon and eggs. That was his routine. And as Eugene aged and his bones became more brittle, the doctors said he needed to be more careful walking around. In his mind, however, Eugene was twenty years younger. He never remembered to step carefully.

"All my life I was fascinated by memory," Squire told me. "Then I met E.P., and saw how rich life can be even if you can't remember it. The brain has this amazing ability to find happiness even when the memories of it are gone.

"It's hard to turn that off, though, which ultimately worked against him."

Beverly tried to use her understanding of habits to help Eugene avoid problems as he aged. She discovered that she could short-circuit some of his worst patterns by inserting new cues. If she didn't keep bacon in the fridge, Eugene wouldn't eat multiple, unhealthy breakfasts. When she put a salad next to his chair, he would sometimes pick at it, and as the meal became a habit, he

stopped searching the kitchen for treats. His diet gradually improved.

Despite these efforts, however, Eugene's health still declined. One spring day, Eugene was watching television when he suddenly shouted. Beverly ran in and saw him clutching his chest. She called an ambulance. At the hospital, they diagnosed a minor heart attack. By then the pain had passed and Eugene was fighting to get off his gurney. That night, he kept pulling off the monitors attached to his chest so he could roll over and sleep. Alarms would blare and nurses would rush in. They tried to get him to quit fiddling with the sensors by taping the leads in place and telling him they would use restraints if he continued fussing. Nothing worked. He forgot the threats as soon as they were issued.

Then his daughter told a nurse to try complimenting him on his willingness to sit still, and to repeat the compliment, over and over, each time she saw him. "We wanted to, you know, get his pride involved," his daughter, Carol Rayes, told me. "We'd say, 'Oh, Dad, you're really doing something important for science by keeping these doodads in place.' " The nurses started to dote on him. He loved it. After a couple of days, he did whatever they asked. Eugene returned home a week later.

Then, in the fall of 2008, while walking through his living room, Eugene tripped on a ledge near the fireplace, fell, and broke his hip. At the hospital, Squire and his team worried that he would have panic attacks because he wouldn't know where he was. So they left notes by his bedside explaining what had happened and posted photos of his children on the walls. His wife and kids came every day.

Eugene, however, never grew worried. He never asked why he was in the hospital. "He seemed at peace with all the uncertainty by that point," said Squire. "It had been fifteen years since he had lost his memory. It was as if part of his brain knew there were some things he would never understand and was okay with that."

Beverly came to the hospital every day. "I spent a long time talking to him," she said. "I told him that I loved him, and about our kids and what a good life we had. I pointed to the pictures and

talked about how much he was adored. We were married for fifty-seven years, and forty-two of those were a real, normal marriage. Sometimes it was hard, because I wanted my old husband back so much. But at least I knew he was happy.”

A few weeks later, his daughter came to visit. “What’s the plan?” Eugene asked when she arrived. She took him outside in a wheelchair, onto the hospital’s lawn. “It’s a beautiful day,” Eugene said. “Pretty nice weather, huh?” She told him about her kids and they played with a dog. She thought he might be able to come home soon. The sun was going down. She started to get ready to take him inside.

Eugene looked at her.

“I’m lucky to have a daughter like you,” he said. She was caught off-guard. She couldn’t remember the last time he had said something so sweet.

“I’m lucky that you’re my dad,” she told him.

“Gosh, it’s a beautiful day,” he said. “What do you think about the weather?”

That night, at one o’clock in the morning, Beverly’s phone rang. The doctor said Eugene had suffered a massive heart attack and the staff had done everything possible, but hadn’t been able to revive him. He was gone. After his death, he would be celebrated by researchers, the images of his brain studied in hundreds of labs and medical schools.

“I know he would have been really proud to know how much he contributed to science,” Beverly told me. “He told me once, pretty soon after we got married, that he wanted to do something important with his life, something that mattered. And he did. He just never remembered any of it.”

2

THE CRAVING BRAIN **How to Create New Habits**

I.

One day in the early 1900s, a prominent American executive named Claude C. Hopkins was approached by an old friend with a new business idea. The friend had discovered an amazing product, he explained, that he was convinced would be a hit. It was a toothpaste, a minty, frothy concoction he called “Pepsodent.” There were some dicey investors involved—one of them had a string of busted land deals; another, it was rumored, was connected to the mob—but this venture, the friend promised, was going to be huge. If, that is, Hopkins would consent to help design a national promotional campaign.^{2.1}

Hopkins, at the time, was at the top of a booming industry that had hardly existed a few decades earlier: advertising. Hopkins was the man who had convinced Americans to buy Schlitz beer by boasting that the company cleaned their bottles “with live steam,” while neglecting to mention that every other company used the exact same method. He had seduced millions of women into purchasing Palmolive soap by proclaiming that Cleopatra had washed with it, despite the sputtering protests of outraged historians. He had made Puffed Wheat famous by saying that it was “shot from guns” until the grains puffed “to eight times normal size.” He had turned dozens of previously unknown products—

5

STARBUCKS AND THE HABIT OF SUCCESS **When Willpower Becomes Automatic**

I.

The first time Travis Leach saw his father overdose, he was nine years old. His family had just moved into a small apartment at the end of an alleyway, the latest in a seemingly endless series of relocations that had most recently caused them to abandon their previous home in the middle of the night, throwing everything they owned into black garbage bags after receiving an eviction notice. Too many people coming and going too late at night, the landlord said. Too much noise.

Sometimes, at his old house, Travis would come home from school and find the rooms neatly cleaned, leftovers meticulously wrapped in the fridge and packets of hot sauce and ketchup in Tupperware containers. He knew this meant his parents had temporarily abandoned heroin for crank and spent the day in a cleaning frenzy. Those usually ended badly. Travis felt safer when the house was messy and his parents were on the couch, their eyes half-lidded, watching cartoons. There is no chaos at the end of a heroin fog.

Travis's father was a gentle man who loved to cook and, except for a stint in the navy, spent his entire life within a few miles of his parents in Lodi, California. Travis's mother, by the time everyone moved into the alleyway apartment, was in prison for heroin

possession and prostitution. His parents were, essentially, functional addicts and the family maintained a veneer of normalcy. They went camping every summer and on most Friday nights attended his sister and brother's softball games. When Travis was four years old, he went to Disneyland with his dad and was photographed for the first time in his life, by a Disney employee. The family camera had been sold to a pawn shop years before.

On the morning of the overdose, Travis and his brother were playing in the living room on top of blankets they laid out on the floor each night for sleeping. Travis's father was getting ready to make pancakes when he stepped into the bathroom. He was carrying the tube sock that contained his needle, spoon, lighter, and cotton swabs. A few moments later, he came out, opened the refrigerator to get the eggs, and crashed to the floor. When the kids ran around the corner, their father was convulsing, his face turning blue.

Travis's siblings had seen an overdose before and knew the drill. His brother rolled him onto his side. His sister opened his mouth to make sure he wouldn't choke on his tongue, and told Travis to run next door, ask to use the neighbor's phone, and dial 911.

"My name is Travis, my dad is passed out, and we don't know what happened. He's not breathing," Travis lied to the police operator. Even at nine years old, he knew why his father was unconscious. He didn't want to say it in front of the neighbor. Three years earlier, one of his dad's friends had died in their basement after shooting up. When the paramedics had taken the body away, neighbors gawked at Travis and his sister while they held the door open for the gurney. One of the neighbors had a cousin whose son was in his class, and soon everyone in school had known.

After hanging up the phone, Travis walked to the end of the alleyway and waited for the ambulance. His father was treated at the hospital that morning, charged at the police station in the afternoon, and home again by dinnertime. He made spaghetti. Travis turned ten a few weeks later.



When Travis was sixteen, he dropped out of high school. “I was tired of being called a faggot,” he said, “tired of people following me home and throwing things at me. Everything seemed really overwhelming. It was easier to quit and go somewhere else.” He moved two hours south, to Fresno, and got a job at a car wash. He was fired for insubordination. He got jobs at McDonald’s and Hollywood Video, but when customers were rude—“I wanted *ranch dressing*, you moron!”—he would lose control.

“Get out of my drive-through!” he shouted at one woman, throwing the chicken nuggets at her car before his manager pulled him inside.

Sometimes he’d get so upset that he would start crying in the middle of a shift. He was often late, or he’d take a day off for no reason. In the morning, he would yell at his reflection in the mirror, order himself to be better, to suck it up. But he couldn’t get along with people, and he wasn’t strong enough to weather the steady drip of criticisms and indignities. When the line at his register would get too long and the manager would shout at him, Travis’s hands would start shaking and he’d feel like he couldn’t catch his breath. He wondered if this is what his parents felt like, so defenseless against life, when they started using drugs.

One day, a regular customer at Hollywood Video who’d gotten to know Travis a little bit suggested he think about working at Starbucks. “We’re opening a new store on Fort Washington, and I’m going to be an assistant manager,” the man said. “You should apply.” A month later, Travis was a barista on the morning shift.

That was six years ago. Today, at twenty-five, Travis is the manager of two Starbucks where he oversees forty employees and is responsible for revenues exceeding \$2 million per year. His salary is \$44,000 and he has a 401(k) and no debt. He’s never late to work. He does not get upset on the job. When one of his employees started crying after a customer screamed at her, Travis took her aside.

“Your apron is a shield,” he told her. “Nothing anyone says will ever hurt you. You will always be as strong as you want to be.”

He picked up that lecture in one of his Starbucks training courses, an education program that began on his first day and continues

throughout an employee's career. The program is sufficiently structured that he can earn college credits by completing the modules. The training has, Travis says, changed his life. Starbucks has taught him how to live, how to focus, how to get to work on time, and how to master his emotions. Most crucially, it has taught him willpower.

“Starbucks is the most important thing that has ever happened to me,” he told me. “I owe everything to this company.”



For Travis and thousands of others, Starbucks—like a handful of other companies—has succeeded in teaching the kind of life skills that schools, families, and communities have failed to provide. With more than 137,000 current employees and more than one million alumni, Starbucks is now, in a sense, one of the nation's largest educators. All of those employees, in their first year alone, spent at least fifty hours in Starbucks classrooms, and dozens more at home with Starbucks' workbooks and talking to the Starbucks mentors assigned to them.

At the core of that education is an intense focus on an all-important habit: willpower. Dozens of studies show that willpower is the single most important keystone habit for individual success.^{5.1} In a 2005 study, for instance, researchers from the University of Pennsylvania analyzed 164 eighth-grade students, measuring their IQs and other factors, including how much willpower the students demonstrated, as measured by tests of their self-discipline.

Students who exerted high levels of willpower were more likely to earn higher grades in their classes and gain admission into more selective schools. They had fewer absences and spent less time watching television and more hours on homework. “Highly self-disciplined adolescents outperformed their more impulsive peers on every academic-performance variable,” the researchers wrote. “Self-discipline predicted academic performance more robustly than did IQ. Self-discipline also predicted which students would improve their grades over the course of the school year, whereas IQ did

not.... Self-discipline has a bigger effect on academic performance than does intellectual talent.”^{5.2}

And the best way to strengthen willpower and give students a leg up, studies indicate, is to make it into a habit. “Sometimes it looks like people with great self-control aren’t working hard—but that’s because they’ve made it automatic,” Angela Duckworth, one of the University of Pennsylvania researchers told me. “Their willpower occurs without them having to think about it.”

For Starbucks, willpower is more than an academic curiosity. When the company began plotting its massive growth strategy in the late 1990s, executives recognized that success required cultivating an environment that justified paying four dollars for a fancy cup of coffee. The company needed to train its employees to deliver a bit of joy alongside lattes and scones. So early on, Starbucks started researching how they could teach employees to regulate their emotions and marshal their self-discipline to deliver a burst of pep with every serving. Unless baristas are trained to put aside their personal problems, the emotions of some employees will inevitably spill into how they treat customers. However, if a worker knows how to remain focused and disciplined, even at the end of an eight-hour shift, they’ll deliver the higher class of fast food service that Starbucks customers expect.

The company spent millions of dollars developing curriculums to train employees on self-discipline. Executives wrote workbooks that, in effect, serve as guides to how to make willpower a habit in workers’ lives.^{5.3} Those curriculums are, in part, why Starbucks has grown from a sleepy Seattle company into a behemoth with more than seventeen thousand stores and revenues of more than \$10 billion a year.

So how does Starbucks do it? How do they take people like Travis—the son of drug addicts and a high school dropout who couldn’t muster enough self-control to hold down a job at McDonald’s—and teach him to oversee dozens of employees and tens of thousands of dollars in revenue each month? What, precisely, did Travis learn?

II.

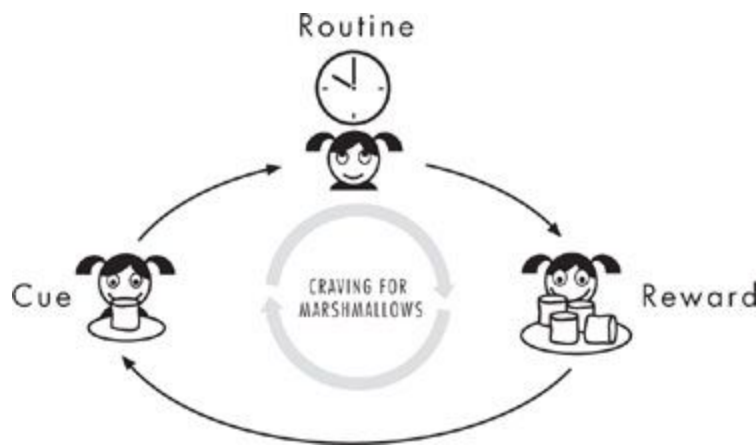
Everyone who walked into the room where the experiment was being conducted at Case Western Reserve University agreed on one thing: The cookies smelled delicious. They had just come out of the oven and were piled in a bowl, oozing with chocolate chips. On the table next to the cookies was a bowl of radishes. All day long, hungry students walked in, sat in front of the two foods, and submitted, unknowingly, to a test of their willpower that would upend our understanding of how self-discipline works.

At the time, there was relatively little academic scrutiny into willpower. Psychologists considered such subjects to be aspects of something they called “self-regulation,” but it wasn’t a field that inspired great curiosity. There was one famous experiment, conducted in the 1960s, in which scientists at Stanford had tested the willpower of a group of four-year-olds. The kids were brought into a room and presented with a selection of treats, including marshmallows. They were offered a deal: They could eat one marshmallow right away, or, if they waited a few minutes, they could have two marshmallows. Then the researcher left the room. Some kids gave in to temptation and ate the marshmallow as soon as the adult left. About 30 percent managed to ignore their urges, and doubled their treats when the researcher came back fifteen minutes later. Scientists, who were watching everything from behind a two-way mirror, kept careful track of which kids had enough self-control to earn the second marshmallow.

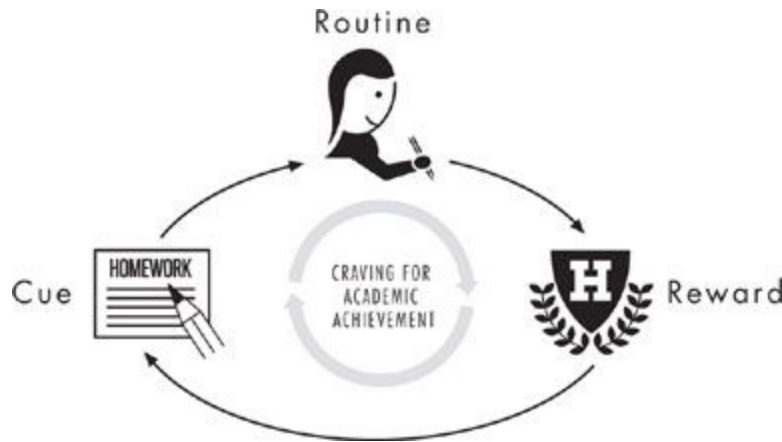
Years later, they tracked down many of the study’s participants. By now, they were in high school. The researchers asked about their grades and SAT scores, ability to maintain friendships, and their capacity to “cope with important problems.” They discovered that the four-year-olds who could delay gratification the longest ended up with the best grades and with SAT scores 210 points higher, on average, than everyone else. They were more popular and did fewer drugs. If you knew how to avoid the temptation of a marshmallow

as a preschooler, it seemed, you also knew how to get yourself to class on time and finish your homework once you got older, as well as how to make friends and resist peer pressure. It was as if the marshmallow-ignoring kids had self-regulatory skills that gave them an advantage throughout their lives.^{5.4}

Scientists began conducting related experiments, trying to figure out how to help kids increase their self-regulatory skills. They learned that teaching them simple tricks—such as distracting themselves by drawing a picture, or imagining a frame around the marshmallow, so it seemed more like a photo and less like a real temptation—helped them learn self-control. By the 1980s, a theory emerged that became generally accepted: Willpower is a learnable skill, something that can be taught the same way kids learn to do math and say “thank you.” But funding for these inquiries was scarce. The topic of willpower wasn’t in vogue. Many of the Stanford scientists moved on to other areas of research.



WHEN KIDS LEARN HABITS FOR DELAYING THEIR CRAVINGS...



THOSE HABITS SPILL OVER TO OTHER PARTS OF LIFE

However, when a group of psychology PhD candidates at Case Western—including one named Mark Muraven—discovered those studies in the mid-nineties, they started asking questions the previous research didn't seem to answer. To Muraven, this model of willpower-as-skill wasn't a satisfying explanation. A skill, after all, is something that remains constant from day to day. If you have the skill to make an omelet on Wednesday, you'll still know how to make it on Friday.

In Muraven's experience, though, it felt like he forgot how to exert willpower all the time. Some evenings he would come home from work and have no problem going for a jog. Other days, he couldn't do anything besides lie on the couch and watch television. It was as if his brain—or, at least, that part of his brain responsible for making him exercise—had forgotten how to summon the willpower to push him out the door. Some days, he ate healthily. Other days, when he was tired, he raided the vending machines and stuffed himself with candy and chips.

If willpower is a skill, Muraven wondered, then why doesn't it remain constant from day to day? He suspected there was more to willpower than the earlier experiments had revealed. But how do you test that in a laboratory?

Muraven's solution was the lab containing one bowl of freshly baked cookies and one bowl of radishes. The room was essentially a closet with a two-way mirror, outfitted with a table, a wooden chair, a hand bell, and a toaster oven. Sixty-seven undergraduates were recruited and told to skip a meal. One by one, the undergrads sat in front of the two bowls.

"The point of this experiment is to test taste perceptions," a researcher told each student, which was untrue. The point was to force students—but only *some* students—to exert their willpower. To that end, half the undergraduates were instructed to eat the cookies and ignore the radishes; the other half were told to eat the radishes and ignore the cookies. Muraven's theory was that ignoring cookies is hard—it takes willpower. Ignoring radishes, on the other hand, hardly requires any effort at all.

"Remember," the researcher said, "eat only the food that has been assigned to you." Then she left the room.

Once the students were alone, they started munching. The cookie eaters were in heaven. The radish eaters were in agony. They were miserable forcing themselves to ignore the warm cookies. Through the two-way mirror, the researchers watched one of the radish eaters pick up a cookie, smell it longingly, and then put it back in the bowl. Another grabbed a few cookies, put them down, and then licked melted chocolate off his fingers.

After five minutes, the researcher reentered the room. By Muraven's estimation, the radish eaters' willpower had been thoroughly taxed by eating the bitter vegetable and ignoring the treats; the cookie eaters had hardly used any of their self-discipline.

"We need to wait about fifteen minutes for the sensory memory of the food you ate to fade," the researcher told each participant. To pass the time, she asked them to complete a puzzle. It looked fairly simple: trace a geometric pattern without lifting your pencil from the page or going over the same line twice. If you want to quit, the researcher said, ring the bell. She implied the puzzle wouldn't take long.

In truth, the puzzle was impossible to solve.

This puzzle wasn't a way to pass time; it was the most important part of the experiment. It took enormous willpower to keep working on the puzzle, particularly when each attempt failed. The scientists wondered, would the students who had already expended their willpower by ignoring the cookies give up on the puzzle faster? In other words, was willpower a finite resource?

From behind their two-way mirror, the researchers watched. The cookie eaters, with their unused reservoirs of self-discipline, started working on the puzzle. In general, they looked relaxed. One of them tried a straightforward approach, hit a roadblock, and then started again. And again. And again. Some worked for over half an hour before the researcher told them to stop. On average, the cookie eaters spent almost nineteen minutes apiece trying to solve the puzzle before they rang the bell.

The radish eaters, with their depleted willpower, acted completely different. They muttered as they worked. They got frustrated. One complained that the whole experiment was a waste of time. Some of them put their heads on the table and closed their eyes. One snapped at the researcher when she came back in. On average, the radish eaters worked for only about eight minutes, 60 percent less time than the cookie eaters, before quitting. When the researcher asked afterward how they felt, one of the radish eaters said he was "sick of this dumb experiment."

"By making people use a little bit of their willpower to ignore cookies, we had put them into a state where they were willing to quit much faster," Muraven told me. "There's been more than two hundred studies on this idea since then, and they've all found the same thing. Willpower isn't just a skill. It's a muscle, like the muscles in your arms or legs, and it gets tired as it works harder, so there's less power left over for other things."

Researchers have built on this finding to explain all sorts of phenomena. Some have suggested it helps clarify why otherwise successful people succumb to extramarital affairs (which are most likely to start late at night after a long day of using willpower at work) or why good physicians make dumb mistakes (which most often occur after a doctor has finished a long, complicated task that

requires intense focus).^{5.5} “If you want to do something that requires willpower—like going for a run after work—you have to conserve your willpower muscle during the day,” Muraven told me. “If you use it up too early on tedious tasks like writing emails or filling out complicated and boring expense forms, all the strength will be gone by the time you get home.”^{5.6}



But how far does this analogy extend? Will exercising willpower muscles make them stronger the same way using dumbbells strengthen biceps?

In 2006, two Australian researchers—Megan Oaten and Ken Cheng—tried to answer that question by creating a willpower workout. They enrolled two dozen people between the ages of eighteen and fifty in a physical exercise program and, over two months, put them through an increasing number of weight lifting, resistance training, and aerobic routines.^{5.7} Week after week, people forced themselves to exercise more frequently, using more and more willpower each time they hit the gym.

After two months, the researchers scrutinized the rest of the participants’ lives to see if increased willpower at the gym resulted in greater willpower at home. Before the experiment began, most of the subjects were self-professed couch potatoes. Now, of course, they were in better physical shape. But they were also healthier in other parts of their lives, as well. The more time they spent at the gym, the fewer cigarettes they smoked and the less alcohol, caffeine, and junk food they consumed. They were spending more hours on homework and fewer watching TV. They were less depressed.

Maybe, Oaten and Cheng wondered, those results had nothing to do with willpower. What if exercise just makes people happier and less hungry for fast food?

So they designed another experiment.^{5.8} This time, they signed up twenty-nine people for a four-month money management program. They set savings goals and asked participants to deny themselves luxuries, such as meals at restaurants or movies. Participants were

asked to keep detailed logs of everything they bought, which was annoying at first, but eventually people worked up the self-discipline to jot down every purchase.

People's finances improved as they progressed through the program. More surprising, they also smoked fewer cigarettes and drank less alcohol and caffeine—on average, two fewer cups of coffee, two fewer beers, and, among smokers, fifteen fewer cigarettes each day.^{5.9} They ate less junk food and were more productive at work and school. It was like the exercise study: As people strengthened their willpower muscles in one part of their lives—in the gym, or a money management program—that strength spilled over into what they ate or how hard they worked. Once willpower became stronger, it touched everything.

Oaten and Cheng did one more experiment. They enrolled forty-five students in an academic improvement program that focused on creating study habits.^{5.10} Predictably, participants' learning skills improved. And the students also smoked less, drank less, watched less television, exercised more, and ate healthier, even though all those things were never mentioned in the academic program. Again, as their willpower muscles strengthened, good habits seemed to spill over into other parts of their lives.

“When you learn to force yourself to go to the gym or start your homework or eat a salad instead of a hamburger, part of what's happening is that you're changing how you think,” said Todd Heatherton, a researcher at Dartmouth who has worked on willpower studies.^{5.11} “People get better at regulating their impulses. They learn how to distract themselves from temptations. And once you've gotten into that willpower groove, your brain is practiced at helping you focus on a goal.”

There are now hundreds of researchers, at nearly every major university, studying willpower. Public and charter schools in Philadelphia, Seattle, New York, and elsewhere have started incorporating willpower-strengthening lessons into curriculums. At KIPP, or the “Knowledge Is Power Program”—a collection of charter schools serving low-income students across the nation—teaching self-control is part of the schools' philosophy. (A KIPP school in

Philadelphia gave students shirts proclaiming “Don’t Eat the Marshmallow.”) Many of these schools have dramatically raised students’ test scores.^{5.12}

“That’s why signing kids up for piano lessons or sports is so important. It has nothing to do with creating a good musician or a five-year-old soccer star,” said Heatherton. “When you learn to force yourself to practice for an hour or run fifteen laps, you start building self-regulatory strength. A five-year-old who can follow the ball for ten minutes becomes a sixth grader who can start his homework on time.”^{5.13}

As research on willpower has become a hot topic in scientific journals and newspaper articles, it has started to trickle into corporate America. Firms such as Starbucks—and the Gap, Walmart, restaurants, or any other business that relies on entry-level workers—all face a common problem: No matter how much their employees *want* to do a great job, many will fail because they lack self-discipline. They show up late. They snap at rude customers. They get distracted or drawn into workplace dramas. They quit for no reason.

“For a lot of employees, Starbucks is their first professional experience,” said Christine Deputy, who helped oversee the company’s training programs for more than a decade. “If your parents or teachers have been telling you what to do your entire life, and suddenly customers are yelling and your boss is too busy to give you guidance, it can be really overwhelming. A lot of people can’t make the transition. So we try to figure out how to give our employees the self-discipline they didn’t learn in high school.”

But when companies like Starbucks tried to apply the willpower lessons from the radish-and-cookie studies to the workplace, they encountered difficulties. They sponsored weight-loss classes and offered employees free gym memberships, hoping the benefits would spill over to how they served coffee.^{5.14} Attendance was spotty. It was hard to sit through a class or hit the gym after a full day at work, employees complained. “If someone has trouble with self-discipline at work, they’re probably also going to have trouble

attending a program designed to strengthen their self-discipline *after* work,” Muraven said.

But Starbucks was determined to solve this problem. By 2007, during the height of its expansion, the company was opening seven new stores every day and hiring as many as fifteen hundred employees each week.^{5.15} Training them to excel at customer service—to show up on time and not get angry at patrons and serve everyone with a smile while remembering customers’ orders and, if possible, their names—was essential. People expect an expensive latte delivered with a bit of sparkle. “We’re not in the coffee business serving people,” Howard Behar, the former president of Starbucks, told me. “We’re in the people business serving coffee. Our entire business model is based on fantastic customer service. Without that, we’re toast.”

The solution, Starbucks discovered, was turning self-discipline into an organizational habit.

III.

In 1992, a British psychologist walked into two of Scotland's busiest orthopedic hospitals and recruited five-dozen patients for an experiment she hoped would explain how to boost the willpower of people exceptionally resistant to change.^{5.16}

The patients, on average, were sixty-eight years old. Most of them earned less than \$10,000 a year and didn't have more than a high school degree. All of them had recently undergone hip or knee replacement surgeries, but because they were relatively poor and uneducated, many had waited years for their operations. They were retirees, elderly mechanics, and store clerks. They were in life's final chapters, and most had no desire to pick up a new book.

Recovering from a hip or knee surgery is incredibly arduous. The operation involves severing joint muscles and sawing through bones. While recovering, the smallest movements—shifting in bed or flexing a joint—can be excruciating. However, it is essential that patients begin exercising almost as soon as they wake from surgery. They must begin moving their legs and hips before the muscles and skin have healed, or scar tissue will clog the joint, destroying its flexibility. In addition, if patients don't start exercising, they risk developing blood clots. But the agony is so extreme that it's not unusual for people to skip out on rehab sessions. Patients, particularly elderly ones, often refuse to comply with doctors' orders.

The Scottish study's participants were the types of people most likely to fail at rehabilitation. The scientist conducting the experiment wanted to see if it was possible to help them harness their willpower. She gave each patient a booklet after their surgeries that detailed their rehab schedule, and in the back were thirteen additional pages—one for each week—with blank spaces and instructions: "My goals for this week are _____ ? Write down exactly what you are going to do. For example, if you are going to go for a walk this week, write down where and when you are going

to walk.” She asked patients to fill in each of those pages with specific plans. Then she compared the recoveries of those who wrote out goals with those of patients who had received the same booklets, but didn’t write anything.

It seems absurd to think that giving people a few pieces of blank paper might make a difference in how quickly they recover from surgery. But when the researcher visited the patients three months later, she found a striking difference between the two groups. The patients who had written plans in their booklets had started walking almost twice as fast as the ones who had not. They had started getting in and out of their chairs, unassisted, almost three times as fast. They were putting on their shoes, doing the laundry, and making themselves meals quicker than the patients who hadn’t scribbled out goals ahead of time.

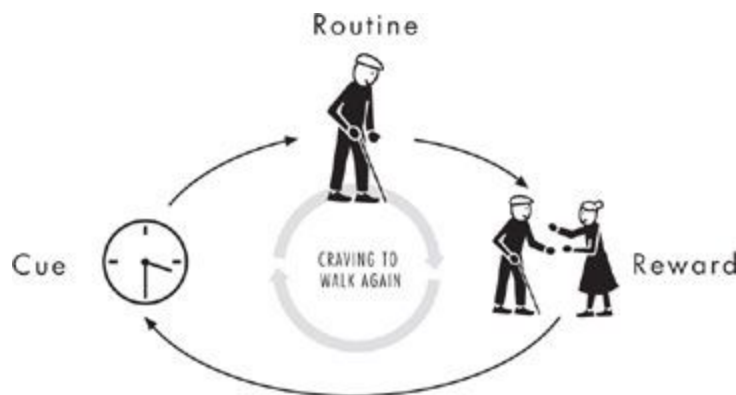
The psychologist wanted to understand why. She examined the booklets, and discovered that most of the blank pages had been filled in with specific, detailed plans about the most mundane aspects of recovery. One patient, for example, had written, “I will walk to the bus stop tomorrow to meet my wife from work,” and then noted what time he would leave, the route he would walk, what he would wear, which coat he would bring if it was raining, and what pills he would take if the pain became too much. Another patient, in a similar study, wrote a series of very specific schedules regarding the exercises he would do each time he went to the bathroom. A third wrote a minute-by-minute itinerary for walking around the block.

As the psychologist scrutinized the booklets, she saw that many of the plans had something in common: They focused on how patients would handle a specific moment of anticipated pain. The man who exercised on the way to the bathroom, for instance, knew that each time he stood up from the couch, the ache was excruciating. So he wrote out a plan for dealing with it: Automatically take the first step, right away, so he wouldn’t be tempted to sit down again. The patient who met his wife at the bus stop dreaded the afternoons, because that stroll was the longest and most painful each day. So he

detailed every obstacle he might confront, and came up with a solution ahead of time.

Put another way, the patients' plans were built around inflection points when they knew their pain—and thus the temptation to quit—would be strongest. The patients were telling themselves how they were going to make it over the hump.

Each of them, intuitively, employed the same rules that Claude Hopkins had used to sell Pepsodent. They identified simple cues and obvious rewards. The man who met his wife at the bus stop, for instance, identified an easy cue—*It's 3:30, she's on her way home!*—and he clearly defined his reward—*Honey, I'm here!* When the temptation to give up halfway through the walk appeared, the patient could ignore it because he had crafted self-discipline into a habit.



PATIENTS DESIGNED WILLPOWER HABITS TO HELP THEM OVERCOME PAINFUL INFLECTION POINTS

There's no reason why the other patients—the ones who didn't write out recovery plans—couldn't have behaved the same way. All the patients had been exposed to the same admonitions and warnings at the hospital. They all knew exercise was essential for their recovery. They all spent weeks in rehab.

But the patients who didn't write out any plans were at a significant disadvantage, because they never thought ahead about how to deal with painful inflection points. They never deliberately designed willpower habits. Even if they intended to walk around the

block, their resolve abandoned them when they confronted the agony of the first few steps.



When Starbucks's attempts at boosting workers' willpower through gym memberships and diet workshops faltered, executives decided they needed to take a new approach. They started by looking more closely at what was actually happening inside their stores. They saw that, like the Scottish patients, their workers were failing when they ran up against inflection points. What they needed were institutional habits that made it easier to muster their self-discipline.

Executives determined that, in some ways, they had been thinking about willpower all wrong. Employees with willpower lapses, it turned out, had no difficulty doing their jobs most of the time. On the average day, a willpower-challenged worker was no different from anyone else. But sometimes, particularly when faced with unexpected stresses or uncertainties, those employees would snap and their self-control would evaporate. A customer might begin yelling, for instance, and a normally calm employee would lose her composure. An impatient crowd might overwhelm a barista, and suddenly he was on the edge of tears.^{5.17}

What employees really needed were clear instructions about how to deal with inflection points—something similar to the Scottish patients' booklets: a routine for employees to follow when their willpower muscles went limp.^{5.18} So the company developed new training materials that spelled out routines for employees to use when they hit rough patches. The manuals taught workers how to respond to specific cues, such as a screaming customer or a long line at a cash register. Managers drilled employees, role-playing with them until the responses became automatic. The company identified specific rewards—a grateful customer, praise from a manager—that employees could look to as evidence of a job well done.

Starbucks taught their employees how to handle moments of adversity by giving them willpower habit loops.

When Travis started at Starbucks, for instance, his manager introduced him to the habits right away. “One of the hardest things about this job is dealing with an angry customer,” Travis’s manager told him. “When someone comes up and starts yelling at you because they got the wrong drink, what’s your first reaction?”

“I don’t know,” Travis said. “I guess I feel kind of scared. Or angry.”

“That’s natural,” his manager said. “But our job is to provide the best customer service, even when the pressure’s on.” The manager flipped open the Starbucks manual, and showed Travis a page that was largely blank. At the top, it read, “When a customer is unhappy, my plan is to ... ”

“This workbook is for you to imagine unpleasant situations, and write out a plan for responding,” the manager said. “One of the systems we use is called the *LATTE* method. We *Listen* to the customer, *Acknowledge* their complaint, *Take action* by solving the problem, *Thank* them, and then *Explain* why the problem occurred.”^{5.19}



THE LATTE HABIT LOOP

“Why don’t you take a few minutes, and write out a plan for dealing with an angry customer. Use the *LATTE* method. Then we can role-play a little bit.”

Starbucks has dozens of routines that employees are taught to use during stressful inflection points. There’s the *What What Why* system

of giving criticism and the *Connect, Discover, and Respond* system for taking orders when things become hectic. There are learned habits to help baristas tell the difference between patrons who just want their coffee (“A hurried customer speaks with a sense of urgency and may seem impatient or look at their watch”) and those who need a bit more coddling (“A regular customer knows other baristas by name and normally orders the same beverage each day”). Throughout the training manuals are dozens of blank pages where employees can write out plans that anticipate how they will surmount inflection points. Then they practice those plans, again and again, until they become automatic.^{5.20}

This is how willpower becomes a habit: by choosing a certain behavior ahead of time, and then following that routine when an inflection point arrives. When the Scottish patients filled out their booklets, or Travis studied the *LATTE* method, they decided ahead of time how to react to a cue—a painful muscle or an angry customer. When the cue arrived, the routine occurred.

Starbucks isn't the only company to use such training methods. For instance, at Deloitte Consulting, the largest tax and financial services company in the world, employees are trained in a curriculum named “Moments That Matter,” which focuses on dealing with inflection points such as when a client complains about fees, when a colleague is fired, or when a Deloitte consultant has made a mistake. For each of those moments, there are preprogrammed routines—*Get Curious, Say What No One Else Will, Apply the 5/5/5 Rule*—that guide employees in how they should respond. At the Container Store, employees receive more than 185 hours of training in their first year alone. They are taught to recognize inflection points such as an angry coworker or an overwhelmed customer, and habits, such as routines for calming shoppers or defusing a confrontation. When a customer comes in who seems overwhelmed, for example, an employee immediately asks them to visualize the space in their home they are hoping to organize, and describe how they'll feel when everything is in its place. “We've had customers come up to us and say, ‘This is better than a visit to my shrink,’ ” the company's CEO told a reporter.^{5.21}

IV.

Howard Schultz, the man who built Starbucks into a colossus, isn't so different from Travis in some ways.^{5.22} He grew up in a public housing project in Brooklyn, sharing a two-bedroom apartment with his parents and two siblings. When he was seven years old, Schultz's father broke his ankle and lost his job driving a diaper truck. That was all it took to throw the family into crisis. His father, after his ankle healed, began cycling through a series of lower-paying jobs. "My dad never found his way," Schultz told me. "I saw his self-esteem get battered. I felt like there was so much more he could have accomplished."

Schultz's school was a wild, overcrowded place with asphalt playgrounds and kids playing football, basketball, softball, punch ball, slap ball, and any other game they could devise. If your team lost, it could take an hour to get another turn. So Schultz made sure his team always won, no matter the cost. He would come home with bloody scrapes on his elbows and knees, which his mother would gently rinse with a wet cloth. "You don't quit," she told him.

His competitiveness earned him a college football scholarship (he broke his jaw and never played a game), a communications degree, and eventually a job as a Xerox salesman in New York City. He'd wake up every morning, go to a new midtown office building, take the elevator to the top floor, and go door-to-door, politely inquiring if anyone was interested in toner or copy machines. Then he'd ride the elevator down one floor and start all over again.

By the early 1980s, Schultz was working for a plastics manufacturer when he noticed that a little-known retailer in Seattle was ordering an inordinate number of coffee drip cones. Schultz flew out and fell in love with the company. Two years later, when he heard that Starbucks, then just six stores, was for sale, he asked everyone he knew for money and bought it.

That was 1987. Within three years, there were eighty-four stores; within six years, more than a thousand. Today, there are seventeen

thousand stores in more than fifty countries.

Why did Schultz turn out so different from all the other kids on that playground? Some of his old classmates are today cops and firemen in Brooklyn. Others are in prison. Schultz is worth more than \$1 billion. He's been heralded as one of the greatest CEOs of the twentieth century. Where did he find the determination—the willpower—to climb from a housing project to a private jet?

"I don't really know," he told me. "My mom always said, 'You're going to be the first person to go to college, you're going to be a professional, you're going to make us all proud.' She would ask these little questions, 'How are you going to study tonight? What are you going to do tomorrow? How do you know you're ready for your test?' It trained me to set goals.

"I've been really lucky," he said. "And I really, genuinely believe that if you tell people that they have what it takes to succeed, they'll prove you right."

Schultz's focus on employee training and customer service made Starbucks into one of the most successful companies in the world. For years, he was personally involved in almost every aspect of how the company was run. In 2000, exhausted, he handed over day-to-day operations to other executives, at which point, Starbucks began to stumble. Within a few years, customers were complaining about the quality of the drinks and customer service. Executives, focused on a frantic expansion, often ignored the complaints. Employees grew unhappy. Surveys indicated people were starting to equate Starbucks with tepid coffee and empty smiles.

So Schultz stepped back into the chief executive position in 2008. Among his priorities was restructuring the company's training program to renew its focus on a variety of issues, including bolstering employees'—or "partners," in Starbucks' lingo—willpower and self-confidence. "We had to start earning customer and partner trust again," Schultz told me.

At about the same time, a new wave of studies was appearing that looked at the science of willpower in a slightly different way. Researchers had noticed that some people, like Travis, were able to create willpower habits relatively easily. Others, however, struggled,

no matter how much training and support they received. What was causing the difference?

Mark Muraven, who was by then a professor at the University of Albany, set up a new experiment.^{5.23} He put undergraduates in a room that contained a plate of warm, fresh cookies and asked them to ignore the treats. Half the participants were treated kindly. “We ask that you please don’t eat the cookies. Is that okay?” a researcher said. She then discussed the purpose of the experiment, explaining that it was to measure their ability to resist temptations. She thanked them for contributing their time. “If you have any suggestions or thoughts about how we can improve this experiment, please let me know. We want you to help us make this experience as good as possible.”

The other half of the participants weren’t coddled the same way. They were simply given orders.

“You *must not* eat the cookies,” the researcher told them. She didn’t explain the experiment’s goals, compliment them, or show any interest in their feedback. She told them to follow the instructions. “We’ll start now,” she said.

The students from both groups had to ignore the warm cookies for five minutes after the researcher left the room. None gave in to temptation.

Then the researcher returned. She asked each student to look at a computer monitor. It was programmed to flash numbers on the screen, one at a time, for five hundred milliseconds apiece. The participants were asked to hit the space bar every time they saw a “6” followed by a “4.” This has become a standard way to measure willpower—paying attention to a boring sequence of flashing numbers requires a focus akin to working on an impossible puzzle.

Students who had been treated kindly did well on the computer test. Whenever a “6” flashed and a “4” followed, they pounced on the space bar. They were able to maintain their focus for the entire twelve minutes. Despite ignoring the cookies, they had willpower to spare.

Students who had been treated rudely, on the other hand, did terribly. They kept forgetting to hit the space bar. They said they

were tired and couldn't focus. Their willpower muscle, researchers determined, had been fatigued by the brusque instructions.

When Muraven started exploring why students who had been treated kindly had more willpower he found that the key difference was the sense of control they had over their experience. "We've found this again and again," Muraven told me. "When people are asked to do something that takes self-control, if they think they are doing it for personal reasons—if they feel like it's a choice or something they enjoy because it helps someone else—it's much less taxing. If they feel like they have no autonomy, if they're just following orders, their willpower muscles get tired much faster. In both cases, people ignored the cookies. But when the students were treated like cogs, rather than people, it took a lot more willpower."

For companies and organizations, this insight has enormous implications. Simply giving employees a sense of agency—a feeling that they are in control, that they have genuine decision-making authority—can radically increase how much energy and focus they bring to their jobs. One 2010 study at a manufacturing plant in Ohio, for instance, scrutinized assembly-line workers who were empowered to make small decisions about their schedules and work environment.^{5.24} They designed their own uniforms and had authority over shifts. Nothing else changed. All the manufacturing processes and pay scales stayed the same. Within two months, productivity at the plant increased by 20 percent. Workers were taking shorter breaks. They were making fewer mistakes. Giving employees a sense of control improved how much self-discipline they brought to their jobs.

The same lessons hold true at Starbucks. Today, the company is focused on giving employees a greater sense of authority. They have asked workers to redesign how espresso machines and cash registers are laid out, to decide for themselves how customers should be greeted and where merchandise should be displayed. It's not unusual for a store manager to spend hours discussing with his employees where a blender should be located.

"We've started asking partners to use their intellect and creativity, rather than telling them 'take the coffee out of the box, put the cup

here, follow this rule,' ” said Kris Engskov, a vice president at Starbucks. “People want to be in control of their lives.”

Turnover has gone down. Customer satisfaction is up. Since Schultz’s return, Starbucks has boosted revenues by more than \$1.2 billion per year.

V.

When Travis was sixteen, before he dropped out of school and started working for Starbucks, his mother told him a story. They were driving together, and Travis asked why he didn't have more siblings. His mother had always tried to be completely honest with her children, and so she told him that she had become pregnant two years before Travis was born but had gotten an abortion. They already had two children at that point, she explained, and were addicted to drugs. They didn't think they could support another baby. Then, a year later, she became pregnant with Travis. She thought about having another abortion, but it was too much to bear. It was easier to let nature take its course. Travis was born.

"She told me that she had made a lot of mistakes, but that having me was one of the best things that ever happened to her," Travis said. "When your parents are addicts, you grow up knowing you can't always trust them for everything you need. But I've been really lucky to find bosses who gave me what was missing. If my mom had been as lucky as me, I think things would have turned out different for her."

A few years after that conversation, Travis's father called to say that an infection had entered his mother's bloodstream through one of the places on her arm she used to shoot up. Travis immediately drove to the hospital in Lodi, but she was unconscious by the time he arrived. She died a half hour later, when they removed her life support.

A week later, Travis's father was in the hospital with pneumonia. His lung had collapsed. Travis drove to Lodi again, but it was 8:02 P.M. when he got to the emergency room. A nurse brusquely told him he'd have to come back tomorrow; visiting hours were over.

Travis has thought a lot about that moment since then. He hadn't started working at Starbucks yet. He hadn't learned how to control his emotions. He didn't have the habits that, since then, he's spent years practicing. When he thinks about his life now, how far he is

from a world where overdoses occur and stolen cars show up in driveways and a nurse seems like an insurmountable obstacle, he wonders how it's possible to travel such a long distance in such a short time.

"If he had died a year later, everything would have been different," Travis told me. By then, he would have known how to calmly plead with the nurse. He would have known to acknowledge her authority, and then ask politely for one small exception. He could have gotten inside the hospital. Instead, he gave up and walked away. "I said, 'All I want to do is talk to him once,' and she was like, 'He's not even awake, it's after visiting hours, come back tomorrow.' I didn't know what to say. I felt so small."

Travis's father died that night.

On the anniversary of his death, every year, Travis wakes up early, takes an extra-long shower, plans out his day in careful detail, and then drives to work. He always arrives on time.