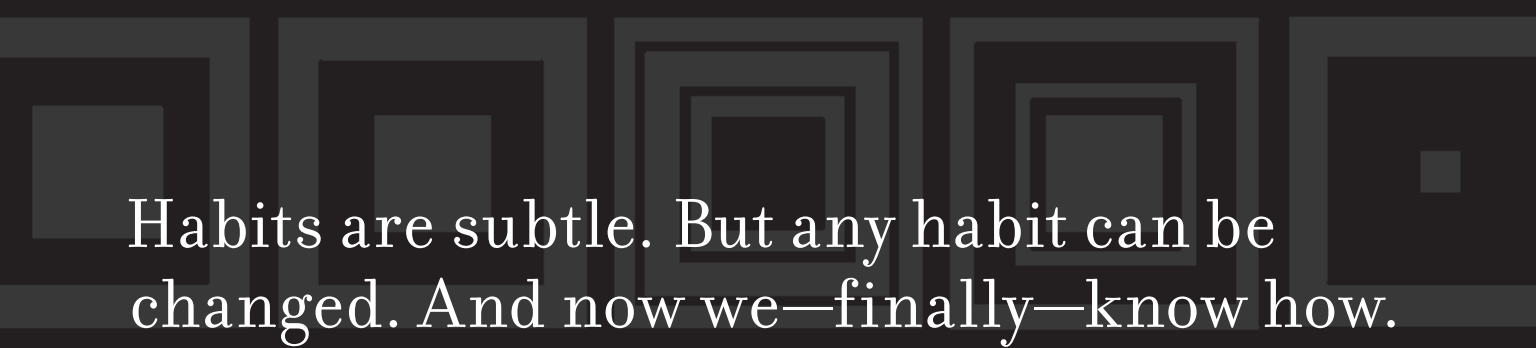




(and How
They
Change)

How
Habits
Work

Charles
Duhigg



Habits are subtle. But any habit can be changed. And now we—finally—know how.

THE POWER OF HABIT

When you woke up this morning, what did you do first? Did you hop in the shower, check your email, or grab a doughnut from the kitchen counter? What did you say to your kids on the way out the door? When you got to your desk at work, did you deal with email, chat with a colleague, or jump into writing a memo? When you got home, did you put on your sneakers and go for a run, or pour yourself a drink and eat dinner in front of the TV?

Most of the choices we make each day may feel like the products of well-considered decision making, but they're not.

They're habits.

And though each habit means relatively little on its own, over time, the meals we order, what we say to our kids each night, whether we save or spend, how often we exercise, and the way we organize our thoughts and our work routines have enormous impacts on our health, productivity, financial security, and happiness. One paper published by a Duke University researcher in 2006 found that more than 40 percent of the actions people performed each day weren't actual decisions, but habits.

“Most of the choices we make each day may feel like the products of well-considered decision making, but they're not. They're habits.”

Countless people, from Aristotle to Oprah, have tried to understand why habits exist. But only in the past two decades have neurologists, psychologists, sociologists, and marketers really begun understanding how habits work—and more important, how they change.

HOW HABITS FUNCTION

The Neurologically Transparent Rat. To understand how a habit works, consider a series of experiments conducted at the Massachusetts Institute of Technology.

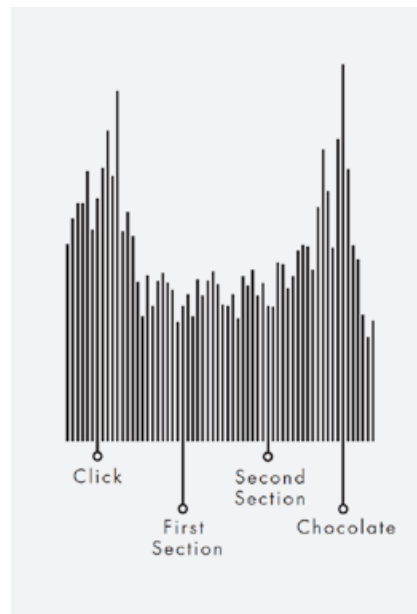
A group of neuroscientist had implanted sensors into the brains of rats so they could observe the smallest changes within their brains. Then, they put each rat into a T-shaped maze with chocolate at one end. The maze was structured so that each animal was positioned behind a barrier that opened after a loud click. The first time a rat was placed in the maze, it would usually wander slowly up and down the center aisle after the barrier slid away, sniffing in corners and scratching at walls. It appeared to smell the chocolate, but couldn't figure out how to find it. There was no discernible pattern in the rat's meanderings, and no indication it was working hard to find the treat.

A Habit is Born. The probes in the rats' heads, however, told a different story. While each animal wandered through the maze, its brain was working furiously. Every time a rat sniffed the air or scratched a wall, the neurosensors inside the animal's head exploded with activity. As the scientists repeated the experiment, again and again, the rats eventually stopped sniffing corners and making wrong turns and began to zip through the maze with more and more speed. And within their brains, something unexpected occurred: as each rat learned how to complete

the maze more quickly, its mental activity decreased. As the path became more and more automatic—as it became a habit—the rats started thinking less and less.

This process, in which the brain converts a sequence of actions into an automatic routine, is called “chunking.” Left to its own devices, the brain will try to “chunk” almost any repeated behavior into a habit, because habits allow our minds to conserve effort. But conserving mental energy is tricky, because if our minds power down at the wrong moment, we might fail to notice something important. So our brains have devised a clever system to determine when to let a habit take over. It’s something that happens whenever a chunk of behavior starts or ends—and it helps to explain why habits are so difficult to change, despite our best intentions.

Cues and Rewards. Consider again the chocolate-seeking rats. As the animals’ ability to navigate the maze became habitual, there were only two spikes in the rats’ brain activity—once at the beginning of the maze, when the rat heard the click right before the barrier slid away, and once at the end, when the rats found the chocolate.



From behind the partition, the rat wasn't sure what waited on the other side, until it heard the click, which it had come to associate with the maze. Once it heard the click, it knew to use the "maze habit," and its brain activity settled. Then at the end of the activity, when the reward appeared, it signaled to the brain that that particular habit was worth remembering, and the neurological pathway was laid that much deeper.

The Habit Loop. This process within our brains that creates habits 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 and storing. Over time, this loop—cue, routine, reward; cue, routine, reward—becomes more and more automatic. The cue and reward become neurologically intertwined until a sense of craving emerges—and a habit is born.

HOW HABITS CHANGE

The Exercise Experiment. Luckily, simply understanding this habit loop makes them easier to control. Take, for instance, a series of studies conducted a few years ago at Columbia University. Researchers wanted to understand how exercise habits emerge. In one project they contacted 10,500 members of a health-insurance plan and invited them to classes stressing the importance of exercise. Half the participants received an extra lesson on the theories of habit formation (the structure of the habit loop) and were asked to identify cues and rewards that might help them develop exercise routines.

The results were dramatic. Over the next four months, those participants who deliberately identified cues and rewards ahead of time spent more than twice as much time exercising as their peers. Other studies have yielded similar results. According to a recent study from New Mexico State University, if you want to start running in the morning, it's essential that you choose a simple cue (like always putting on your sneakers before breakfast or leaving your running clothes next to your bed) and a clear reward (such as a midday treat or even the sense of accomplishment that comes from ritually recording your miles in a log book). After a while, your brain will start anticipating that reward—craving the treat or the feeling of accomplishment—and there will be a measurable neurological pressure to lace up your jogging shoes each morning.

Trying It Out Myself. Back before I even decided to write a book about the science of habit formation, I had another goal: I wanted to lose weight.

I had gotten into a bad habit of going to the cafeteria every afternoon and eating a chocolate chip cookie, which contributed to my gaining a few pounds. Eight, to be precise. I put a post-it note on my computer reading “NO MORE COOKIES.” But every afternoon, I managed to ignore that note, wander to the cafeteria, buy a cookie and eat it while chatting with colleagues around the cash register. Tomorrow, I always promised myself, I’ll muster the willpower to resist.

Tomorrow, I ate another cookie.

When I started interviewing experts in habit formation, I concluded each interview by asking what I should do. The first step, they said, was to figure out my habit loop. The routine was simple: every afternoon, I walked to the cafeteria, bought a cookie and ate it while chatting with friends.

How to Identify Cues and Rewards. Next came some less obvious questions: What was the cue? Hunger? Boredom? Low blood sugar? And what was the reward? The taste of the cookie itself? The temporary distraction from my work? The chance to socialize with colleagues?

We’re often not conscious of the rewards driving our habits. So one day, when I felt a cookie impulse, I went outside and took a walk, instead. The next day, I went to the cafeteria and bought

a coffee. The next, I bought an apple and ate it while chatting with friends. You get the idea. I wanted to test different theories regarding what reward I was really craving. Was it hunger? (In which case the apple should have worked.) Was it the desire for a quick burst of energy? (If so, the coffee should suffice.) Or, as turned out to be the answer, was it that after several hours spent focused on the work in front of me, I wanted to socialize, to make sure I was up to speed on office gossip, and the cookie was just a convenient excuse? When I walked to a colleague's desk and chatted for a few minutes, it turned out, my cookie urge was gone.

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All that was left was identifying the cue.

Deciphering cues is hard, however. Our lives often contain too much information to figure out what is triggering a particular behavior. Do you eat breakfast at a certain time because you're hungry? Or because the morning news is on? Or because your kids have started eating?

Experiments have shown that most cues fit into one of five categories: Location, time, emotional state, other people or the immediately preceding action. So to figure out the cue for my cookie habit, I wrote down five things the moment the urge hit:

Where are you? (sitting at my desk)

What time is it? (3:36 pm)

What's your emotional state? (bored)

Who else is around? (no one)

What action preceded the urge? (answered an email)

The next day I did the same thing. And the next. Pretty soon, the cue was clear: I always felt an urge to snack at around 3:30.

The Secret to Permanent Change. Once I had figured all the parts of the loop, it seemed fairly easy to change my habit. But the psychologists and neuroscientists warned me that, for the new behavior to stick, I needed to abide by what is known as The Golden Rule of Habit Change: to shift the routine—to socialize, rather than eat a cookie—I needed to piggyback on an existing habit. So now, every day at about 3:30, I stand up, look around the newsroom for someone to talk to, spend 10 minutes gossiping, then go back to my desk. The cue and reward have stayed

the same. Only the routine has shifted. It doesn't feel like a decision, any more than the MIT rats made a decision to run through the maze. It's now a habit.

I've lost 21 pounds since then.

HOW COMPANIES CREATE CUSTOMER HABITS

The Toothpaste Magnate. One day in the early 1900s, a prominent American advertising 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” that was going to be huge. If, that is, Hopkins would consent to help design a national promotional campaign.

Hopkins was the ad 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 turned dozens of products—Quaker Oats, Goodyear tires, the

Bissell carpet sweeper, Van Camp's pork and beans—into household names. And in the process, he had made himself rich.

However, when his old friend approached Hopkins about Pepsodent, the ad man expressed only mild interest. Hopkins knew that selling toothpaste was financial suicide. There was already an army of door-to-door salesmen hawking dubious tooth powders and elixirs, most of them going broke.

The problem was that hardly anyone bought toothpaste because hardly anyone brushed their teeth.

The friend, however, was persistent. He came back again and again, appealing to Hopkins's considerable ego until, eventually, the ad man gave in.

It would be the wisest financial decision of Hopkins's life.

Within five years of that partnership, Hopkins turned Pepsodent into one of the best-known products on earth and, in the process, helped create a toothbrushing habit that moved across America with startling speed. A decade after the first Pepsodent campaign, pollsters found that toothbrushing had become a daily ritual for more than half the American population.

Hopkins' Rules for Creating Consumer Habits. The secret to his success, Hopkins would later boast, was that he had found a secret formula that fueled a habit. It's an alchemy so powerful that even today the basic principles are still used by consumer goods giants, video game designers, food companies, hospitals, and millions of salesmen around the world.

So what, exactly, did Hopkins do?

He created a craving. And that craving, it turns out, is what makes cues and rewards work.

To sell Pepsodent, Hopkins knew he needed a cue that would justify the toothpaste's daily use. He sat down with a pile of dental textbooks. "It was dry reading," he later wrote in his autobiography. "But in the middle of one book I found a reference to the mucin plaques on teeth, which I afterward called 'the film.' That gave me an appealing idea. I resolved to advertise this toothpaste as a creator of beauty. To deal with that cloudy film."

“He created a craving. And that craving, it turns out, is what makes cues and rewards work.”

The brilliance of this appeal was that it relied upon a cue—tooth film—that was impossible to ignore. Telling someone to run their tongue across their teeth, it turns out, is likely to cause them to run their tongue across their teeth. And when they did, they were likely to feel a film.

Moreover, the reward was even more enticing. Who, after all, doesn't want a prettier smile?

Soon, cities were plastered with Pepsodent ads.

“Just run your tongue across your teeth,” read one. “You'll feel a film—that's what makes your teeth look 'off color' and invites decay. Pepsodent removes the film!”

Three weeks later, there were so many orders for Pepsodent that the company couldn't keep up.

“I made for myself a million dollars on Pepsodent,” Hopkins wrote a few years later. The key, he said, was that he had “learned the right human psychology.” That psychology was grounded in two basic rules:

1. First, find a simple and obvious cue.
2. Second, clearly define the rewards.

But it turns out, that's not quite enough. There's a third rule to creating a habit—one that Hopkins himself didn't realize until much later.

The Third Rule. A few years after Pepsodent started dominating the marketplace, researchers at competing companies began scrambling to figure out why.

One interesting thing about Pepsodent, which no one—including Hopkins—had paid much attention to at first was the recipe. Unlike other toothpastes of the period, Pepsodent contained citric acid, as well as doses of mint oil and other chemicals. Pepsodent’s inventor had used those ingredients to make the toothpaste taste fresh, but they had another, unanticipated effect as well: They’re irritants that create a cool, tingling sensation on the tongue and gums.

“ Claude Hopkins, it turns out, wasn’t just selling beautiful teeth. He was selling a sensation. Once people craved that cool tingling—once they equated it with cleanliness—brushing became a habit.

When researchers at other companies started polling customers on why they used Pepsodent, they found that people said if they forgot to use the toothpaste, they realized their mistake because they missed that cool, tingling sensation in their mouths. They expected—they craved—that slight irritation. If it wasn’t there, their mouths didn’t feel clean.

Claude Hopkins, it turns out, wasn't just selling beautiful teeth. He was selling a sensation. Once people craved that cool tingling—once they equated it with cleanliness—brushing became a habit.

When other companies discovered what Hopkins was really selling, they started imitating him. Within a few decades, almost every toothpaste contained oils and chemicals that caused gums to tingle. Soon, Pepsodent started getting outsold. Even today, almost all toothpastes contain additives with the sole job of making your mouth tingle after you brush.

Applying Hopkins' Rules to Your Life (or Product). Anyone can use this basic formula to create habits of her or his own. Want to exercise more? Choose a cue, such as going to the gym as soon as you wake up, and a reward, such as a smoothie after each workout. Then think about that smoothie, or about the endorphin rush you'll feel. Allow yourself to anticipate—to crave—the reward. Eventually, that craving will make it easier to push through the gym doors every day.

Want to craft a new eating habit? When researchers affiliated with the National Weight Control Registry—a project involving more than six thousand people who have lost more than thirty pounds—looked at the habits of successful dieters, they found that 78 percent of them ate breakfast every morning, a meal cued by a time of day. But most of the successful dieters also envisioned a specific reward for sticking with their diet—a bikini they wanted to wear or the sense of pride they felt when they stepped on the scale each day—something they chose carefully and

really wanted. They focused on the craving for that reward when temptations arose, cultivated the craving into a mild obsession. And their cravings for that reward, researchers found, crowded out the temptation to drop the diet. The craving drove the habit loop.

Companies now use the same rules all the time. Take the foam that occurs when you shampoo your hair.

“Shampoo doesn’t have to foam,” said Tracy Sinclair, who was a brand manager for Oral-B and Crest Kids Toothpaste. “But we add foaming chemicals because people expect it each time they wash their hair. Same thing with laundry detergent.

“Once the customer starts expecting that foam, the habit starts growing.”

HOW TO CHANGE EMPLOYEES’ HABITS

Crazy Paul O’Neill. On a blustery October day in 1987, a herd of prominent Wall Street investors and stock analysts gathered in the ballroom of a posh Manhattan hotel. They were there to meet the new CEO of the Aluminum Company of America—or Alcoa, as it was known—a corporation that, for nearly a century, had manufactured everything from the foil that wraps Hershey’s Kisses and the metal in Coca-Cola cans to the bolts that hold satellites together.

A few minutes before noon, the new CEO, Paul O'Neill, took the stage. He was fifty-one years old, trim, and dressed in gray pinstripes and a red tie. He looked dignified, solid, like a chief executive is supposed to look.

Then he opened his mouth.

"I want to talk to you about worker safety," he said. "Every year, numerous Alcoa workers are injured so badly that they miss a day of work.

"I intend to make Alcoa the safest company in America. I intend to go for zero injuries."

The audience was confused. These meetings usually followed a predictable script: A new CEO would promise to boost profits and lower costs. Then, the speech would end with a blizzard of buzzwords—"synergy," "rightsizing," and "co-opetition."

But O'Neill hadn't said anything about profits. There was no talk of 'using alignment to achieve a win-win synergistic market advantage.'

"Now, before I go any further," O'Neill said, "I want to point out the safety exits in this room." He gestured to the rear of the ballroom. "There's a couple of doors in the back, and in the unlikely event of a fire or other emergency, you should calmly walk out, go down the stairs to the lobby, and leave the building."

The investors almost stampeded out the doors when the presentation ended. One jogged to the lobby, found a pay phone, and called his twenty largest clients.

“I said, ‘The board put a crazy hippie in charge and he’s going to kill the company,’” that investor told me. “I ordered them to sell their stock immediately. It was literally the worst piece of advice I gave in my entire career.”

Within a year of O’Neill’s speech, Alcoa’s profits would hit a record high. By the time O’Neill retired in 2000 and became U.S. Treasury Secretary, Alcoa’s market capitalization had risen by \$27 billion. Someone who invested a million dollars in Alcoa on the day O’Neill was hired would have earned another million dollars in dividends while he headed the company, and the value of their stock would be five times bigger when he left.

What’s more, all that growth occurred while Alcoa became one of the safest companies in the world.

Keystone Habits. So how did O’Neill make one of the largest, stodgiest, and most potentially dangerous companies into a profit machine and a bastion of safety?

By attacking one habit and then watching the changes ripple through the organization.

“I knew I had to transform Alcoa,” O’Neill told me. “But you can’t order people to change. So I decided I was going to start by focusing on one thing. If I could start disrupting the habits around one thing, it would spread throughout the entire company.”

O’Neill believed that some habits have the power to start a chain reaction. These are “keystone habits,” and they can start a process that, over time, transforms everything.

Identifying keystone habits, however, is tricky. One way is to look for them is to identify what is known within academic literature as “small wins.”

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Take, for instance, the Olympian Michael Phelps, who has won more gold medals than any other swimmer. Before every race—and most other days—Phelps has the exact same routine. He wakes up at the same time every day. He always eats the same breakfast: eggs, oatmeal, and four energy shakes. Two hours before the starting gun, he always stretches the same way, and then listens to a hip-hop mix. Right before a race starts, when the announcer says

his name, Phelps steps onto his block and then down again, as he always does. Then he swings his arms three times, as he has before every race since he was twelve years old.

Why this almost robotic routine?

Winning is a Natural Extension. “If you were to ask Michael what’s going on in his head before competition, he would say he’s not really thinking about anything,” his coach, Bob Bowman, told me.

“But that’s not right. It’s more like his habits have taken over. When the race arrives, he’s more than halfway through his plan and he’s been victorious at every step. All the stretches went like he planned. The warm-up laps were just like he visualized. His headphones are playing exactly what he expected. The actual race is just another step in a pattern that started earlier that day and has been nothing but victories.

“Winning is a natural extension.”

Small Wins At Alcoa. The same thing happened at Alcoa. Soon after O’Neill arrived, because of his insistence on new safety policies, there was a small decline in the injury rate. Alcoa experienced a small win.

Then O’Neill pounced.

“I want to congratulate everyone for bringing down the number of accidents, even just for two weeks,” he wrote in a memo that made its way through the entire company. “We shouldn’t celebrate because we’ve followed the rules, or brought down a number. We should celebrate because we are saving lives.”

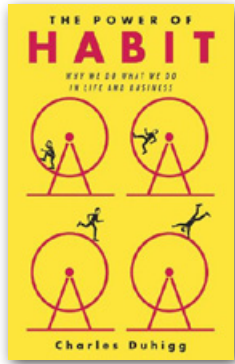
Workers made copies of the note and taped it to their lockers. Someone painted a mural of O’Neill on one of the walls of a smelting plant. Just as Michael Phelps’s routines had nothing to do with swimming and everything to do with his success, so O’Neill’s efforts began snowballing into changes that were unrelated to safety, but transformative nonetheless.

For instance, soon employees—who just a year earlier had gone on strike—were suggesting new ways to arrange machines so they could be more productive. Workers started coming in earlier and staying later. “The culture changed entirely,” O’Neill told me. “People became convinced we could create a culture of excellence.”

And it all started with one small win.

If you look for the keystone habits within your own organization—or life—you’ll find small opportunities for tiny victories. Those are the levers that can spark a chain reaction of wide spread change. 📌

Info



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ABOUT THE AUTHOR | Charles Duhigg is an investigative reporter for *The New York Times*. He is a winner of the National Academies of Sciences, National Journalism, and George Polk awards, and was part of a team of finalists for the 2009 Pulitzer Prize. He is a frequent contributor to *This American Life*, NPR, *PBS NewsHour*, and *Frontline*. A graduate of Harvard Business School and Yale College, he lives in Brooklyn with his wife and two kids. To learn more, visit charlesduhigg.com.

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