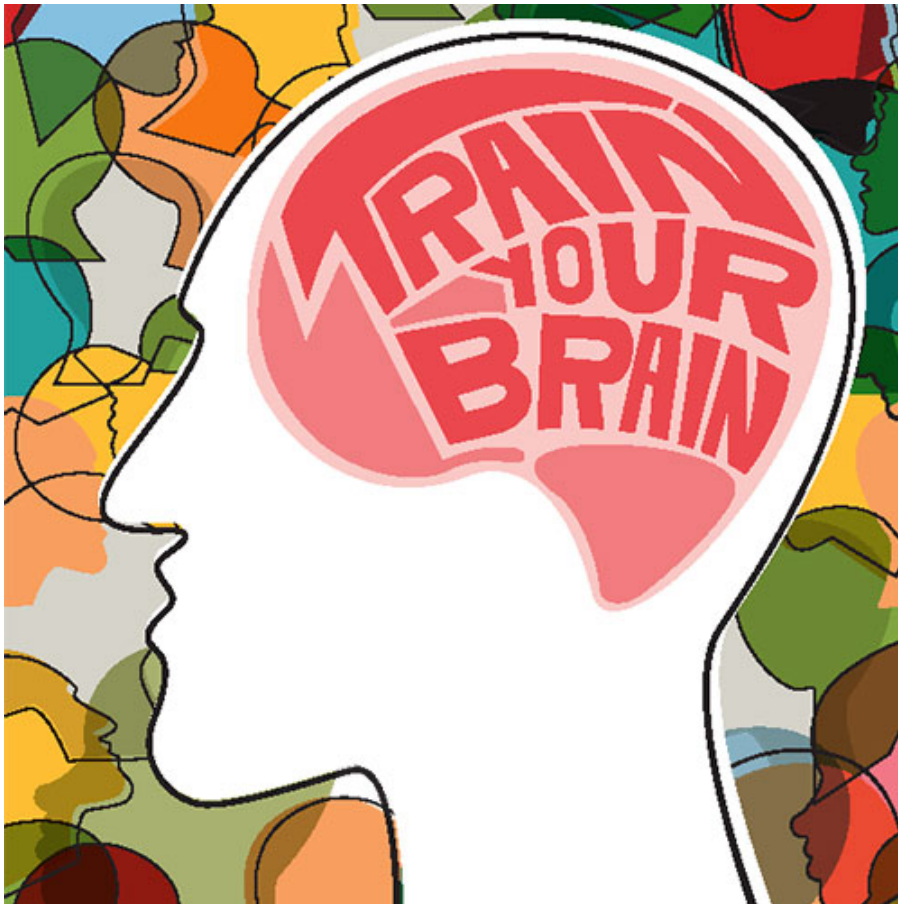


Train Your Brain for Better Habits

The trick to breaking bad habits and developing healthy ones

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Every morning when your alarm goes off, you grab your cell phone and start scrolling. Sometimes you start doing it before your eyes are fully open—almost without thinking. You're in similar autopilot mode when you reach for the towel on the right side of the towel rack instead of the left and drive to work following the exact

same route you always take. These habits are all so ingrained in your brain that you don't have to devote any serious energy to making them happen. They just do.

A habit, by definition, is something you do regularly and without much thought. There are "good" habits (such as checking your blood glucose throughout the day) and "bad" ones (smoking cigarettes). Some form quickly or accidentally, and others take quite a bit of effort to adopt, but one thing is clear: Once a habit is solidified, it's pretty hard to break.

People with diabetes hear a lot about healthy lifestyle habits, such as exercising more often, cutting back on saturated fat, and nixing sugary drinks. While you can certainly make yourself do any of these things, it might not be easy. That's because—at least in the beginning—these aren't really habits; they're behaviors.

A healthy behavior can turn into a habit, of course, but it doesn't happen overnight. Take exercise. Some people wake up and debate if they should sleep in or go for a jog. Whether they end up rolling over or lacing up their sneakers, they're choosing to perform a behavior. Others hear the alarm and start getting ready for their workout before they're fully awake. "It's not even a decision," says Theresa Desrochers, PhD, assistant professor of neuroscience and psychiatry and human behavior at Brown University.

So how can you take a desired behavior and turn it into a true habit? According to neuroscientists, psychologists, and other behavior-change experts, there are specific, proven steps you can take to transform a new behavior into an effortless habit.

How Habits Are Formed

Although the science is still emerging, there's enough research on habit formation in the brain (mostly on animals) for neuroscientists to have some solid theories. You may not spend a lot of time thinking about your brain, but if you're interested in habit formation, it's worth a brief tour.

Deep inside your brain lies a group of structures collectively known as the basal ganglia. The basal ganglia is like a command center that's constantly receiving data, processing it, and sending it back out. "It gets information from just about everywhere else in the brain, including the visual and motor cortex that are on the surface of the brain," says Desrochers. The information going in and out of the basal ganglia runs along pathways, or loops.

Neuroscientists believe that when thoughts and actions happen repeatedly and at the same time, your basal ganglia tries to keep them together for the sake of efficiency, so they start to travel along the same or linked loops. Over time, this creates a situation in which a trigger (or cue) prompts a default action—in other words, a habit.

Let's say your doctor has advised you to do regular foot checks to make sure you haven't developed any blisters, wounds, or signs of infection. If you attempt to do this randomly from time to time, you'll likely forget. **But if you start looking over your feet every single time you take off your socks, after a while the message in your brain that says "time to take off my socks" will start to be associated with "time to give my feet a once-over."**

As you get more and more accustomed to putting those two things together, the loops in your brain that connect all the related thoughts and actions (including motor skills, like those needed to remove your socks; visual ones that allow your eyes to clearly see your feet; and cognitive processes that let you make sense of what you're seeing and doing) get stronger and stronger.

At the same time, something starts changing within the basal ganglia—specifically, in one part called the striatum. This striped structure is divided into two sections: ventral and dorsal. The ventral section is most active when you're getting used to doing something new, says Scott Russo, PhD, director of the Center for Affective Neuroscience at the Icahn School of Medicine at Mount Sinai. It's loaded with receptors for dopamine, a feel-good brain chemical; when you do something that's pleasurable, you get a spike of dopamine that makes you want to do it again.

After a while, the dorsal half of the striatum takes over, suggests a study published in 2015 in *Neurobiology of Learning and Memory*. At that point, you no longer need a reward because the habit has become solidified in your brain.

In one of Desrochers' studies, published in the journal *Neuron*, she and her colleagues took a group of monkeys and waited for them to look behind a grid of dots to find a reward (a squirt of juice). In the beginning, the

monkeys did this randomly, but over time that changed. “The monkeys made their own habits and started to look around the same way each time,” says Desrochers. As they did, the researchers monitored the monkeys’ brain activity to see how much effort they had to put into finding the reward. “As the monkeys’ method of searching got more habitual, neural activity became more efficient,” she explains.

Making Healthy Changes Stick

Of course, not every healthy behavior starts out as pleasurable. Checking your blood glucose isn’t fun, but it’s still a must. Can you turn it into a real habit as opposed to something you must continually force yourself to do? Maybe, but your best chance is to find something rewarding about it. One simple option: **Grab a piece of paper, draw yourself a chart, and give yourself a check mark every time you check your blood glucose.** Just making the check mark can feel rewarding, and watching those checks add up even more so, especially if you treat yourself to a book or other goody when you get 20 checks in a row. Or take it (slightly) higher tech: Download an app such as HabitBull, and watch all the green dots add up.

Long-term rewards—when you see improvements in your **A1C**, for example—can also be motivating, but those are harder to get excited about on a day-to-day basis. The problem, says Leonard Epstein, PhD, a professor at the University of Buffalo and a researcher for the Science of Behavior Change initiative at the National Institutes of Health, is that we tend to undervalue future rewards. You know the forthcoming reward is valuable, but you still appreciate it less than the reward you can get right now.

Consider, for instance, working out. If you start exercising every day, “maybe you’ll have lost 5 to 10 pounds six months from now,” says Russo. “It’s hard for your brain to put that behavior and that result together.”

Perhaps not surprisingly, research shows that people who find exercise itself enjoyable tend to stick with it longer. In a study published in 2017 in *Personality and Social Psychology Bulletin*, researchers asked gym-goers to rate how much they enjoyed their workouts as well as how important it was to them to exercise to stay healthy. Those who said exercise was really enjoyable logged longer sweat sessions; appreciating exercise for health’s sake didn’t seem to matter. One way to up the enjoyment factor: **Schedule regular workout dates with friends.** You may not like to exercise, but you do love catching up with pals.

Set yourself up for success by breaking down a bigger behavior change into baby steps. Achieving “small, easy wins” can boost your confidence, notes Monica Peek, MD, MPH, a researcher with the Improving Diabetes Care and Outcomes on the South Side of Chicago project. If your goal is to eat a more plant-based diet but you’re currently a meat-lover, don’t try to become a vegetarian overnight; instead, start by experimenting with some new veggies or those you haven’t tried in a while. When you find one you like, you’ll be excited and feel good about yourself (the reward), which might encourage you to add the veggie to meals or continue trying new ones.

Another way to make a behavior that’s good for you in the long run seem rewarding right now: **Bring the distant reward into sharper focus.** Epstein, who’s currently studying how to help people with **prediabetes** avoid **type 2**, believes he’s found a way to do that. In a (not-yet-published) study, he and his colleagues asked participants to home in on their motivations for wanting to make certain lifestyle changes designed to prevent them from getting full-blown diabetes. The more specific and emotional, the better. “I want to live longer” won’t cut it, but this motivation will: “I want to live long enough to be around for the birth of my grandchild, and I can picture the smile on both of our faces when I’m holding him.”

To keep that distant reward top of mind, Epstein’s team had study participants record detailed info about why they were motivated to make a change. Then participants were told to play back the messages as often as necessary, especially whenever they found themselves needing extra motivation to stick with a desired behavior. You can try a similar tactic using a voice recorder app on your smartphone.

Get a Cue

Even if you feel rewarded when implementing a desired behavior, you’re still a few steps away from creating a habit. That’s because the recipe for habit formation also includes cues, repetition, and time.

“A habit is really a memory of what you’re accustomed to doing in a particular situation,” says Art Markman, PhD, professor of psychology at the University of Texas at Austin and author of *Smart Change*. “You get into that situation, the memory gets activated, and it drives you to a specific behavior.”

What sets the process in motion is a cue. “For a lot of smokers, having a cup of coffee is what triggers them to reach for a cigarette,” says Desrochers. But cues work for good habits, too: **Your sneakers stashed by the bed can become a cue to exercise in the morning; brushing your teeth can become the cue to floss.**

If you’re having a hard time remembering to do finger pricks every morning, try leaving your meter on the kitchen counter next to your coffee pot. **If you already have a habit of grabbing a cup of coffee first thing, seeing your supplies right next to the pot can become the cue to check your blood glucose.** After a while, just a whiff of java might be enough to remind you that you need to do a glucose check.

Repetition—and Patience

A lot of people wonder how long they have to nudge themselves to do something they really don’t want to do before it becomes second nature. You might have heard that it takes 66 days to form a habit, but it’s not that simple. That number is from a 2009 study at University College London, and it represents an average. Some of the study participants developed a habit within a mere 18 days; for others, it took the better part of a year (254 days).

Why the discrepancy? It has to do with myriad factors, from how malleable you are, how pleasurable the desired habit is, what else is going on in your life, whether or not you’ve set up strong enough cues, and so on. “There are a lot of myths out there and some research, but in my experience coaching people I haven’t identified a magic number,” says Michelle Segar, PhD, MPH, director of the University of Michigan’s Sport, Health, and Activity Research and Policy Center.

Bottom line: You may have to be very patient, but **the more you repeat a behavior, the more likely it is to eventually turn into a habit.** “Both repetition and consistency—doing something the same way over and over—are important,” says Desrochers.

Out With the Bad

Maybe your current issue isn’t forming a healthy new habit but breaking an unhealthy old one. It’s doable, but not easy: Once a habit has become encoded in your brain, erasing it is about as easy as getting an ink stain out of your favorite white shirt.

Studies show that habits become so entrenched that they’re hard to break even when you take the reward away. “You can teach a bat to press a bar and get a pellet of food, then have them do it over and over again,” says Desrochers. “After a while, even if you devalue the reward—you change the food to make it taste bad—the animal sticks with the behavior.”

To undo a bad habit, forget about willpower. While your brain is equipped to put the brakes on an action you know you shouldn’t take, your ingrained habits are going to be stronger and eventually win out, says Markman.

Instead, **think about what’s keeping that habit in place and work to break it down step by step.** For starters, think about the cues that initially helped you form the particular habit or that might be keeping it in place. If, for instance, you have a tendency to reuse lancets, it means you’re using a lancet and then placing it somewhere other than where it belongs: in a sharps container. Start pricking your finger and putting the lancet directly into that container and—just like that—it’s no longer available for reuse. Do that over and over and your bad habit will eventually be wiped out.

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