Chapter 7

CHOICES AND SIGNALS

"Two roads diverged in a wood, and I—
I took the one less traveled by."
—Robert Frost, "The Road Not Taken," 1916

Frost's poem captures the imagination, and what schoolchild in the United States has not pondered its meaning? Teachers naturally focus on the consequences of unpopular, less-traveled-by decisions, and our life-changing choices shimmer in bold relief.

But the truth is that we are immersed in choices, just as we are immersed in consequences—in fact, the choices exist *because* we are immersed in consequences. Any time we decide what we "feel like" doing, for example, we are really weighing consequences.

We hardly go two minutes without making a choice. On the job, is it time to study a spreadsheet, consult a coworker, or plan for the weekend? Or maybe just pick at a fingernail. We have choices even when we're thinking to ourselves: it may be fun to daydream, but given a more immediate problem to solve, we choose to switch gears.

Back at home, should we watch sports or a sitcom? And what are we going to eat? Large US supermarkets now stock *40,000 items*,[1] overwhelming even European visitors. In the developed world generally, we now have so many choices that some economists and psychologists have argued it's a liability. If so, it's one we don't have the choice to escape.

There's no lack of help, anyway: our friends, our relatives, and a huge number of books advise us on how to make better choices. That's every single dieting bestseller, plus all the manuals on the self-help, parenting, and consumer shelves. But dealing with choice means dealing with consequences.

THE MATCHING GAME

Because choice is so ubiquitous and important, hundreds of studies have examined how it works. Let's begin with some human research. A simple nod or grunt can reward someone for starting a topic of conversation—this is not surprising. In one study utilizing mildly supportive grunts as consequences, college students were asked to recall memories of their childhood. After they had reminisced freely for a while, half of them were rewarded in this unobtrusive way for describing family memories, and the other half for nonfamily memories. More than 80 percent of the students modified their commentary accordingly. And—another theme of this book—most of the students failed to realize what was happening, so unaware are we of subtle consequences (see chapter 9).[2]

Now suppose that you're sitting at a "mingle" table in a cafeteria with two strangers. One of them nods, smiles, and affirms your comments more than the other. Who will you talk to more? That seems pretty obvious. In one study, people ended up spending about twice as much time talking to the rewarding companion as to the wet blanket. As it happened, they also received about twice as many supports from the rewarder. Their conversation choices "matched" their conversation rewards, with a 2:1 ratio for each.[3] This turns out to be a characteristic result when a time-based component is involved and when a series of rewards is available, not just one or two.

For example, suppose you and your significant other are surfing your eighty-channel big-screen TV. Your SO wants to watch a nature show with spectacular big-cat attacks. You want baseball. You switch back and forth between the two, attempting to maximize your viewing pleasure. If the baseball game is kind of slow, not much happening, you'll spend a lot of time watching leaping lions. But you'll keep switching, and the amount of time you spend on each channel should (in theory) come close to matching the number of rewarding sequences. In the same way, multitaskers can deftly skip back and forth between two electronic devices and one real person in the space of one minute.

The *matching law* was originally derived from animal research in the lab, where conditions can be precise. In its full technical form, the equation gets

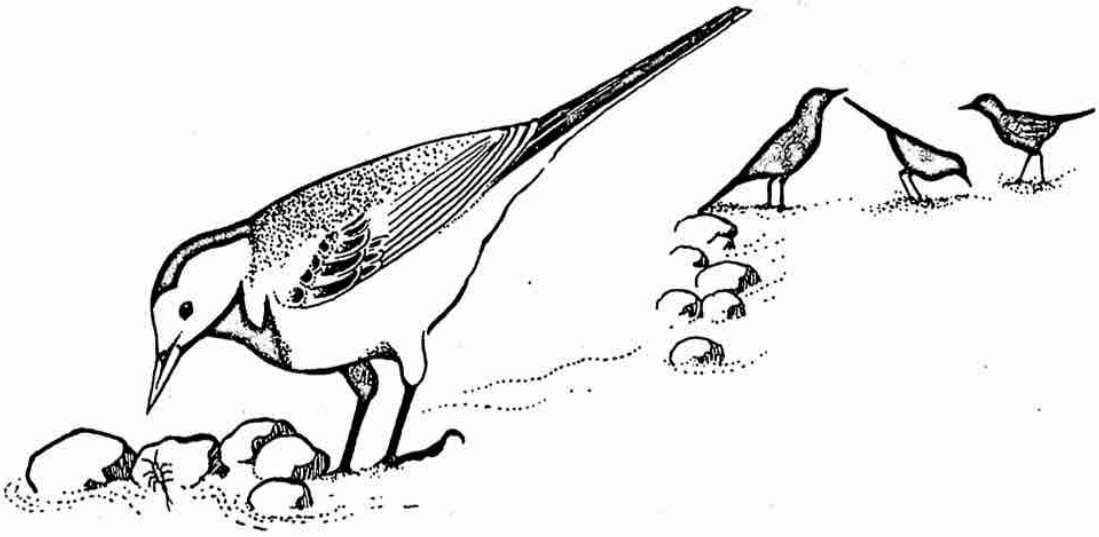
complicated, covering a host of factors and parameters: bias between the behavior choices (an SO who really dislikes baseball), different levels of effort (someone lost the remote, so you have to get up and change channels manually), different types and values of the consequences, delays, schedules, signals, and so forth.[4] Some of the current mathematical models are so high-tech that they employ the differential equations of calculus.[5] Further, in real life, we can be downright inundated with choices, and my own research has helped demonstrate matching with up to four options. Other studies have confirmed even more.[6]

Then there's the necessity of dealing with negatives. A choice that comes with a downside loses some value (the baseball game has commercials, the nature show doesn't), but how do the positives and negatives combine? Sometimes straightforwardly, sometimes less so, it turns out. We are only dimly aware of some consequences, and some of course are substantially delayed, reducing their value—say you want to be able to talk over the game with your pals over the weekend (see chapter 12). All this is not easy to disentangle. What's important is that even the simpler forms of matching appear to offer a decent description of comparable choices in real life.

The surprise isn't so much that choices track consequences in some way. (Imagine how haywire things would be if they didn't.) What was eye-opening were the mathematically consistent and elegant ways in which they did so across so many species, consequences, and behaviors. From domestic animals like cows and chickens to wild species like bluegills, brushtail possums, and coyotes, animals have shown their decision-making skills and "followed the money," just like people.[7] Consequences have varied from social reinforcers to "pleasure center" brain stimulation, from cartoons to drugs; also money, warmth, and (of course) edibles of all kinds.[8] Scenarios have included wild birds foraging in their native habitats, students working on arithmetic problems, and even human conversation, as we've seen. All have produced orderly patterns of repeated choices, well fit by the matching law equation.[9]

Birds in their native habitats? One careful study investigated birds foraging in the wild for insects and spiders. Most of these birds (called "wagtails" for good reason) stayed with a main flock that roamed a large prairie with a fairly constant supply of bugs. But some wagtails had their own ter-

ritories where these tasty items washed up on a riverbank; the longer between visits, the more food that would accumulate. These birds had a choice between feeding with the main flock or going off on their own. The time they spent in the two areas followed the matching law.



Something like the matching law is obeyed by groups: the richer the reinforcer area, the more individuals that will naturally be there. Even fish have been shown to follow a matching-type distribution across foraging patches of different value.[10] Of course, other consequences must be considered, too. One innovative researcher showed how social dominance (the "pecking order") and flocking for protection affected matching for food by ordinary house sparrows.[11] (Dominant birds did better than subordinates, not surprisingly.)

One recent computer model was focused on mimicking selectionism, "the cause that works backward" in evolution and in learning from consequences (variability, then consequences, and then the resulting change in the repertoire). With natural behavioral variability and the history of consequences included, the mathematical model reproduced typical behavioral patterns in choice (matching) and in simpler variable work-based schedules.[12]

SO WHAT CAN THE MATCHING LAW DO?

The matching law can actually *quantify* comparative value. That is useful in all sorts of ways. Suppose you, a farmer, want to find out how much your cows prefer expensive barley over cheaper options. Researchers like New Zealand's Mary Foster have used the matching law to discover exactly how much cattle preferred their favorites over alternatives like chopped hay, ryegrass, and kiwifruit—and how these culinary selections compared to one another. The resulting precise preference scale described most individual data sets well. A few cows with nonconformist tastes had their own scales. (Someone always has to be different.) Once compared to one of the standards, a new feed could be fit directly into the scale: testing confirmed that its relationship to the other feeds could be predicted on that basis, a useful feature called transitivity.[13] These results are valuable for farmers trying to balance cost, nutrition, and acceptability to their herds.

Another study quantified the degree of dislike hens had for loud sounds.[14] Factory-farm noise levels can reach 100 decibels, enough to cause hearing damage in people. One of the most unusual of such animal-welfare studies had pigs choosing between straw, fir branches, or peat as rooting materials.[15] Given these examples, it shouldn't be surprising that dog-food preferences are sometimes assessed in the same precise way.[16] That's big business, after all.

Indeed, Wall Street hasn't ignored the implications: matching can occur when people shop on the Internet, for example (click, click).[17] It's also been shown to apply to heroin addicts giving themselves the therapeutic drug methadone.[18] The matching law may even work for football quarterbacks calling plays: the more yardage gained for passing instead of rushing, the more attempted passes. (However, a revealed bias against passing reflected the greater risk of turnovers and more variability in gains.[19])

In the lab, people often match in the same way that animals do, but not always.[20] These exceptions are informative: With weak reinforcers or low-effort behaviors like keyboard presses, participants sometimes say, in effect, why bother to track the rewards carefully? It's like having the TV on just for the sake of having it on. You're not paying much attention, so even though you're surfing the channels, you don't choose carefully based on what the reward value would more normally be. Then there are instructions and rules:

ironically, they can help us be even more efficient or, if they're wrong, throw us off entirely (see chapter 10). Both of these effects impacted one human matching study in which several participants decided that the payoffs were roughly equal for the different choices, even though that was not actually the case. From then on, they responded equally or randomly to each choice, losing out as a result. Ironically, animals performed significantly better, as did other participants who proved to be more sensitive to the relationships.[21]

WINNING MATCHES

Basic research on choice schedules has turned up some unexpected findings with practical applications for people. In several of my own studies, for example, I found that the most frequently reinforced choice often occurred even if a different behavior had just been rewarded.[22] If you're trying to break a bad habit by encouraging a better but less appealing alternative, this finding can help you understand why the change seldom happens overnight. An off-task schoolgirl just praised for a spell of diligence might revert ten minutes later to chatting with a classmate. Consider the choices and their consequences (and consult chapter 14).

Other human applications are widespread. Kids worked on a computer so they could take a spin on an exercycle or watch a video. One schedule of reinforcement applied to the exercycle, and a second to the video, and the children could switch between the schedules freely. The children's choices obeyed the matching law, and were predictably influenced by the price to participate—in this case, how hard they had to work on the computer on the two schedules. When the schedules were changed so that working for video watching was harder, most children switched to the exercycle. The most obese children were less influenced by this schedule change, continuing to show a strong preference for the sedentary activity.[23]

Conflict in prekindergarten followed a matching-type relation too. Aggressive four-year-old boys turned out to be successful using yelling and hitting at home. In their families, these methods worked to get what they wanted, while nonaggressive methods were less likely to be rewarded. Boys

with more acceptable ways of coping had families in which the nonaggressive methods were more likely to work.[24]

In their bestselling book *Nudge*, Richard Thaler and Cass Sunstein argue that we are all "choice architects," weighting consequences for others as well as for ourselves. They used the example of food displays in cafeterias that foster healthy or unhealthy choices through changes in factors like behavior effort (what's easy to reach?) and visibility. Someone might want that salad, but if it's on the back row, its reinforcing value might be insufficient to offset the effort of getting it. (There's a reason that manufacturers pay for better positioning of their products in grocery stores.) How much better it would be, the authors suggested, if the understanding and planning implied by "architect" went with the job.[25]

In the previous chapter, schoolkids at recess were rewarded for playing nonaggressively. Those kids had a choice. To reduce a problem behavior like aggression, you don't always have to focus on it; you can instead provide a healthy alternative with a greater reinforcer value. That's being a choice architect. Likewise, two researchers looked at the bigger picture—the context—and found that success in weight loss and alcoholism recovery was sometimes linked with new alternative reinforcers in people's lives such as new friends.[26]

So, context matters a lot. Delayed and immediate, large and small, there are always other choices, other consequences. And there are usually signals that go with them.

GETTING THE SIGNAL

When the same action can bring punishment in one setting and lavish reinforcement in another, it helps to be able to tell the difference. Signals for consequences let us do that. These cues let us all pick up on when to stop and when to go—literally, in the case of traffic lights. The links to consequences are clear. Kids quickly learn that they had better not swear in the presence of their parents or teachers. With their friends, it's a different story, and there are clear links here too. When the boss is frowning, forget about asking for a raise. See a police car? Check your speed. (Taking advantage of signals, some precincts post cars with mannequins in them to utilize their staff more efficiently.)

Chapter 12

FIGHTING THE IMPULSE: SELF-CONTROL, ANYONE?

"The hardest victory is the victory over self."

—Aristotle

There's a reason why self-control has been glorified for millennia: it's hard to achieve. Most rewards don't happen when we want them to, which is right away. Witness the temptation to struggle with debt rather than wait and save for a big purchase.

Societally as well as individually, get-yours-now is hard to resist. The Atlantic Grand Banks cod fishery, one of the richest in the world for centuries, crashed in 1992 from overfishing. Some experts fear it will never recover. Unfortunately for us and for our planet, our susceptibility to short-term rewards can bring long-term disaster.

Fortunately, we can use what we know about consequences to combat our worst impulses. This chapter focuses on the individual challenge, chapter 16 on the societal one.

DETECTING DELAYS

Two researchers occasionally rewarded rats with food for poking their noses into a board with lots of holes. What hole would they return to after they had enjoyed their treat? It wasn't the one they had poked ten minutes ago or even one minute ago. It was the one they were poking when the food came.[1] The logic goes: do something and get an immediate "consequence," and

perhaps what you did caused it. It's worth checking out, anyway. It's like the superstition effect (see chapter 5): Bump against an electric pole right before a blackout and fear that you caused it. Bump half an hour before, no worries.

In nature, this emphasis on immediacy usually makes sense. Move your legs faster and as a consequence you move faster. Right away, not ten minutes later. Catch a fly by flipping out your tongue. Immediately.

Still, ambush hunters like cats learn to wait outside a hole for a tasty mouse. In nature and in the lab, animals can handle some delays. B. F. Skinner found that rats new to the game could pick up lever pressing with an eight-second delay to the reward.[2] Later research stretched this out: Plop Daisy the rat into a box with a lever. With nothing else happening, Daisy eventually presses the lever (hey, it's something to do). Thirty seconds later, a food pellet is delivered. Meanwhile, Daisy's doing other things: sniffing, turning a circle, licking a paw. If she repeats these, she gets no food. Eventually, she presses the lever again. Thirty seconds later, another food pellet. That's a long delay for an animal, but rats can eventually get the connection.[3]

How do we know it's the consequence that starts them pressing regularly and not some other effect of the food? Because when they get the same amounts of food at comparable, variable times but independent of what they do, they *don't* press the lever. Even Siamese fighting fish can learn real but delayed rewards in this way.[4]

Consistency and immediacy are both influential, then, but neither is absolutely essential. One immediate consequence reinforced the nose poking of rats. But so did a consistent dependency without immediacy, as with Daisy's thirty-second delay.

Not surprisingly, people learn new behaviors on this delayed reward procedure too.[5] With enough other things going on, though, it becomes hard even for us to detect the real relation between the consequence and what we did. Consequences, signals, and everything else operate simultaneously over different periods of time. What a muddle. No wonder we have trouble being influenced by delayed consequences: sometimes we can't even tell they are there.

Language bridges delays with helpful rules: Use sunscreen. Take your umbrella. Even long delays in ancient times: plant almond seeds now, harvest almonds years later.

But even with the big advantage of language, look how long it took for us to recognize what caused scurvy. No vitamin C; hello, scurvy. But the consequences are delayed, and the variety of suitable foods to prevent scurvy quite varied. Decades after British naval surgeon James Lind finally proved the effectiveness of fresh citrus fruits, the British navy adopted this approach—but the loss of vitamin C caused by poorly preserved juice meant that British sailors and explorers continued to suffer from scurvy. Fresh meat alone sometimes worked, so fruits and vegetables clearly weren't essential, adding to the confusion. For a while, it was even thought that scurvy might be caused by tainted meat, possibly helping to doom Captain Scott's fatal South Pole expedition.[6] Disentangling real but delayed consequences from the red herrings is one of the triumphs of scientific method.

THE DISAPPEARING REWARD

Now turn this on its head and see how quickly the value of a consequence drops the longer it is delayed. That makes it hard to weigh properly. And that's where self-control comes in.

Our lives are constant choices between consequences (see chapter 7), and many of those consequences are delayed. Eat too much, become overweight. (Later.) Study hard, land a good job. (Later.)

Then there's uncertainty: some delayed consequences are on lean schedules with low probability. For example, don't buckle up, risk more injuries in an accident. (Later. Maybe.) It took years for safety-belt use to become the norm, despite overwhelming evidence of its benefits.[7]

What's more, the same self-control choices can work exactly the opposite for different people. For most of us, for example, saving rather than spending is the challenge. But the stringently frugal have to force themselves to spend—taking self-control too far. The same principle applies to the tragedy of suicide. If felt to be justified and morally necessary, suicide can be a supreme act of self-control: the pain and finality of death is exchanged for the longer-term good of others. Or it can be a supreme failure of self-control: escape overwhelming immediate pain, but miss out on all sorts of delayed reasons to live.

Every day, we ordinary heroes choose present pain for future gain, larger-later desirables over smaller-sooner less desirables (see chapter 6). We take a walk rather than watch TV, turn down the temperature to help the planet and save on the heating bill later, and get chores done instead of procrastinating. Or at least we try. The parallels for animals remain surprisingly close. In a study called "Procrastination by Pigeons," the birds chose more work later over less work now.[8] Sound familiar?

Not surprisingly, self-control has attracted lots of research, and that has enabled scientists to mathematically describe the way in which delayed consequences lose their value. My colleague George Ainslie was one of the first to show that the relationship follows a "hyperbolic" curve, an equation that works for a variety of consequences in a variety of species and across large as well as small time scales. It often works well even when people choose between hypothetical rewards (such as money) to be received at different times, knowing that they won't actually receive them.[9]

Quite apart from the obvious benefits of rules and reasoning, there are exceptions to this "delay discounting."[10] For example, knowing you will be publicly humiliated tomorrow spreads gloom today, and you might well prefer to get it over with. So much for the more typical procrastination effect of putting negatives off, with larger-later preferred over smaller-sooner. As in this case, sometimes classical conditioning helps make the waiting period itself a negative, so smaller-sooner gets chosen instead. For positives, it's usually the impulsive smaller-sooner over larger-later. But, like happy memories in reverse (see chapter 8), the pleasures of anticipation can override the usual delayed drop in a reward's value. One economist asked men to place values on when they could—hypothetically—kiss their favorite movie star. The highest-valued was the three-day delay, not the immediate embrace.[11] There is a reason for songs about anticipation.

What's more, while impulsiveness is usually deplored, sometimes it really is better to take the sure thing now and be done with it. When Poland suffered hyperinflation in the early 1990s, its people learned to spend quickly because their money actually did lose value overnight. When the economy stabilized, this impulsiveness disappeared.[12]

Most tests of delayed consequences fit the hyperbolic equation well, though,

and it succeeds in predicting a peculiar feature of self-control: we change our minds as time progresses and consequence value alters. We start with good intentions: wake up, work out, and resolve to skip dessert at dinner. But hours later, staring at a brownie, we decide maybe we can afford those extra calories after all. Similarly, setting the alarm the night before is easy, but getting up when the alarm goes off isn't. What about hypothetical consequences? Imagine a choice of taking $100 now or $150 in a year. How about $100 in two years versus $150 in three years? Many people reverse their preference.

Animals do the same: given a choice between two seconds of eating delicious grain now versus four seconds of eating in four seconds, pigeons go for smaller-sooner. Add ten-second delays to both choices, though, and the birds get rational: they select larger-later. Same reversal. Same equation.[13] When rats and people both work for real juice available after different delays, their results are quite similar.[14] Rats consistently show more self-control than pigeons when it comes to food.[15] But with learned rewards rather than food, pigeons fall closer into line.[16] And just like us, individuals can be somewhat more or less impulsive.

THE MARSHMALLOW AND THE KID

How about kids? From psychologist Walter Mischel's famous research line, picture a four-year-old left alone to choose between one marshmallow and two. It's no contest—except that getting two means waiting fifteen minutes. With one tempting marshmallow left sitting in front of them, very few kids hold out: some simply eat it immediately. Those who waited substantially longer did substantially better on their SAT college entrance tests many years later.[17] A 1,000-kid study in New Zealand had similar findings, showing benefits twenty-five years later for those with more self-control as youngsters, even taking into account other factors like socioeconomic status.[18]

In one version of Mischel's study, some kids tried to make the negative of waiting into a positive. "They talked to themselves, sang, invented games with their hands and feet, and even tried to fall asleep while waiting—as one child successfully did."[19] We saw in chapter 5 that two-and-a-half-year-old

children on a low-speed schedule developed similar tactics to make it through the delays—pacing around the room, for example. So did some animals.



So how would pigeons do on the marshmallow challenge? Experimental psychologist Allen Neuringer did the research to find out. Birds that waited got the delicious grain they preferred. Birds that gave in to temptation pecked a key and took a smaller amount sooner—and what's more, it was a kind of grain they found boring. Kids did best when they couldn't see the marshmallows. So did the pigeons. Like Mischel, Neuringer also looked at what happened when an alternative activity was available, when the birds were given successful experience with waiting, and when signals helped. Again, results were similar.[20]

For yet more similarities, it's long been known that people who test out as more impulsive in these sorts of lab situations tend to have more problems with smoking, drinking, and drug addiction.[21] This relationship applies in rats too, surprising as that may seem. Rats that were more impulsive on a standard delayed-food test were more likely to give themselves cocaine and to

use more of it.[22] Of course, these relations tell us nothing about what causes what—a classic correlation-doesn't-equal-causation muddle. (Other research shows that rats given cocaine *become* more impulsive—and remain so even several months after they have been off the drug.[23])

Fortunately, there is no question that self-control can be taught. We have already seen that monkeys reared by adults were less impulsive than those reared by other young monkeys (see chapter 3). Mischel studied several methods, as noted previously in the current chapter. We humans have found many ways to nurture self-control.

One approach is very straightforward: researchers gave kids an immediate choice between big and small rewards, then gradually delayed the big reward. Would the kids learn that waiting was worthwhile? Yes, and all the more impressive because these particular children had been selected by their preschool teachers as being especially impulsive.[24] In his bestselling book *Walden Two*, Skinner speculated that his fictional community might teach this critical skill in just this sort of way.[25]

This method can work for animals, too. In one study, rats chose between two levers providing large or small amounts of food, both delayed by six seconds. They picked the large amount, naturally. When the delay for the small reward was then eliminated, the rats continued preferring the delayed large reward (in contrast to what they would have done without this experience). Next, when the two levers reversed in function ("smaller-sooner" became "larger-later" and vice versa), all but one of the original twelve animals reversed also, staying with larger-later, the wiser choice. Impressively, most of them kept showing self-control for delays of up to twenty-four seconds, quite a lot for a small animal.[26]

FIGHTING THE IMPULSE: USING WHAT WE KNOW

News we all can use: examples of consequence-based self-control assistance.

Adding/subtracting consequences. Our fast-food, sound-bite world constantly serves up instant gratification. Witness the texting mania: walking while texting, driving while texting, even skydiving while texting (seriously).

Modern technology can make self-control easier by adding immediate rewards for it. Many vehicles now provide instant mileage feedback, for example, particularly efficient hybrids. No more waiting until you fill your tank to figure out your fuel efficiency. As a result, a new subculture has sprung up, and "hyper-milers" compete for super efficiencies. One hybrid owner referred to the change in driving style as "a little addictive."[27] Who would have thought self-control could be fun?

Using the same strategy, some utilities now offer inside-the-home electric meters displaying real-time usage, sometimes including rewarding color changes for conservation. A pilot program in Canada showed a significant 13 percent average decrease in consumption once customers were able to watch how much power they used.[28]

If there are no natural immediate rewards, try adding artificial extras. A psychologist "would reward herself by playing the video game 'Asteroids' after she had met each daily writing goal. 'By the time I had finished writing my dissertation, I had well over a million points.'"[29]

Let's not forget the dark side. Add negatives: For instance, dab your fingernails with a bitter solution so you don't bite them. Watch scary ads showing sick smokers breathing out of tubes in their throats.

A target of saving, say, $1,000 creates a useful additional reinforcer and beats a loose wish to spend less. Similarly, having a deadline creates a reinforcer for meeting it (see chapter 6). Can homegrown deadlines work? A study by behavioral economist Dan Ariely and a colleague found that students did better with self-created deadlines than with none, but deadlines imposed by others were the most effective.[30] Be careful, though, not to lose sight of the forest for the trees. Researchers find that people who miss their weight-loss goals often report feeling like failures even if they had succeeded in losing some weight.[31] Effective behavioral shaping can take time.

Social support and models. Simply letting others know your goal means extra rewards—and punishers. Encouragement or disappointment from other people can be a powerful motivator. Partner with a friend to exercise or study. Sharing your efforts means learning through observing each other, too.

"Women in Red Racers," an online debt-reduction support group, uses a number of these strategies. Post your debt and your progress toward paying it

off—or your backsliding. Everyone in the group can see and encourage you, as in well-known self-monitoring groups like Weight Watchers and Alcoholics Anonymous. From one of the Racers' members, "having a forum where you can say, 'I just got a $25 birthday check, and I'm putting it toward my Visa balance'—and then getting a round of cheers from your fellow Racers—it's incredible." A system of rewards for milestones includes a smiley face for each $100 off your debt. In less than two years, a few hundred members together paid off about $3 million. "You wouldn't think smiley faces could be so important," said a member.[32]

Signals. Some natural signals come from our own bodies. Detect when you're starting to stress, and you may be able to head off an angry outburst.

Artificial self-control signals are common, too. There is a good reason that radio DJs announce upcoming hits: they signal that staying tuned through a bunch of ads will be rewarded. Relatedly, have you noticed that when you have a full tank of gas, it's harder to exert self-control about unnecessary trips? The next visit to the gas station is too delayed to be effective. When you're getting low on gas, it's easier to drive less and conserve fuel. Signals matter.

We saw that in chains of behavior, each behavior signals the next. These chains often become automatic. Get in the car, buckle up; you don't even think about it. Toothbrushing is a classic example of an even more tight-knit chain.[33] Some chains end in trouble: a TV commercial starts and you immediately wander to the kitchen to get a snack. Train yourself to jog around your living room instead. Break the chain.

Finally, just as for the kids eyeing the marshmallows, anything that draws attention to smaller-sooner rewards can hurt. Hide your temptations. For some, that might be a favorite video; for others, cigarettes or alcohol.

Schedules. Like all rewards, the Women in Red Racers' smileys were earned on a schedule. Some self-control methods build directly on their different qualities.

Chapter 5 introduced a schedule of reinforcement in which progressively more behavior was required over time—toddling, for example. Rewards came only with longer distances toddled. My colleague Steve Higgins introduced a related schedule for drug abstinence, a massive self-control problem. In this schedule, the behavior of interest doesn't change, but the reward value does.

Cocaine addicts had their urine tested three times a week. Being cocaine-free earned a voucher exchangeable for specific items such as clothing, movie tickets, or stereo equipment. The vouchers got steadily larger as the addicts succeeded in staying clean. Fail a test or fail to report in, and the voucher size reset down to its initial value.[34] Voucher programs have proven to be among the most effective in drug treatment (see chapter 15 for more).

A common self-control challenge is getting stuck with a grueling, lean fixed-work schedule (that is, a long ratio to work through for each reward). You can suffer through the characteristic long pause before starting work or schedule extra reinforcers to help get yourself moving. Even better, switch from a fixed to a variable reward schedule. On the variable "reading-the-newspaper" or "gambling" schedule, a reward might always be right around the corner. Steady work is what's typical—but only if the variable schedule includes occasional easy rewards.[35] That's how important they are. So schedule them. (Las Vegas does.)

Commitment. Remember the reversal in preference as time goes by? Make a commitment far enough in advance that you choose wisely and avoid later temptation. Some sleepyheads put their alarm clocks on the other side of the room so they can't just hit the snooze button. At the grocery store, never buy your favorite brand of potato chips—less chance later of instant gratification at home (not shopping when you're hungry helps, too). In several states, problem gamblers can voluntarily ban themselves from casinos and their "addictive"-like variable schedules. If the gamblers go anyway, they face fines and even arrest. Thousands have put themselves on the lists.

It may seem unlikely, but animals can also learn to make commitments and thus maximize their rewards. Psychologist Ainslie gave his impulsive pigeons the option of pecking a commitment key before each choice. If they did so, then after a delay only the larger-later option would be available, no smaller-sooner possibility. Three of the ten birds tried it and learned to commit reliably.[36] Another researcher found that requiring multiple pecks on either key rather than just one choice peck led to more larger-later choices (technically, a "fixed ratio"). The extra delay in doing the extra pecking—even though it was short—was enough to jump-start self-control. Switching in the middle of the extra pecks meant starting them from scratch on the other

choice, and a lot of wasted effort for the bird. The birds learned to commit to their first and wiser choice.[37]

Behavioral economists Richard Thaler and Shlomo Benartzi developed the Save More Tomorrow (SMarT) program to help people overcome the difficulties of making careful financial choices that have delayed consequences (see chapter 1). With an opt-in default for pension plans, for example, employees are automatically entered in a plan. Far more participation results, which is beneficial for the employees.[38] Making a commitment ahead of time eases the way toward wise financial management.

Checklists and charts. Simply checking items off a list, keeping a progress chart, or creating a monthly budget and sticking to it can be surprisingly rewarding. One writer on a deadline noted, "I kept track of my progress on a wall calendar, with a gold star for each week I met my goal. At the end of twenty-six weeks, I had twenty-six gold stars and forty completed chapters. This may sound corny, but it really works."[39] Plenty of electronic "apps" are now using these techniques for self-control challenges as well as a variety of other motivational purposes (even dating or starting a hobby).

Skinner went further, charting exactly how much time he spent writing (see chapter 7), and Anthony Trollope and Ernest Hemingway used a similar strategy, tracking how much they wrote.[40] It works for smokers, too. Karen Pryor graphed the number of cigarettes she smoked each day and was able to quit—for good. Seeing her overall progress helped her through her lapses.[41]

Experience. We've seen that simple practice on a schedule of gradually increasing delays can teach self-control, letting the natural reinforcers be experienced. Similarly, mystery novels are universal favorites: Whodunit? Good writers build the suspense, so the reward value of finding out gets large enough that some of their eager readers turn right to the end. But by persevering through the subtle cues, the delayed reinforcement is all the larger, and most of us learn to exert self-control—with experience.

Catherine the Great described how she learned from experience: "I have made it a rule to begin always with the most difficult, most awkward and most tedious matters; with that out of the way the rest seems easy and agreeable."[42] It's like scheduling dessert at the end of a meal.

Rules. The more we learn, the more sophisticated and effective the rules

we try to live up to. Many of us count to ten or leave the room when we're angry, following age-old self-control rules. Author S. E. Hinton suffered from writer's block for four years after her first book, *The Outsiders*, became a sensation. Her boyfriend finally suggested that she make it a rule to write several pages each day—or he wouldn't take her out in the evening. It worked.[43]

Following rules can be rewarding in itself. Even though I have been working evenings and weekends for years, I still get a virtuous glow because of the cultural rule that I'm going above and beyond. (No wonder I used to be a workaholic. Everything has its dangers.)

Because of cultural rules, seemingly straightforward self-control incentives can be anything but. Two behavioral economists investigated late pickups at daycare centers. When parents started paying a $3 fine for being more than ten minutes late, substantially *more* came late, overall. Why? Because before, parents felt guilty about delaying the staff. Now being late was just part of a minor financial transaction.[44]

TAKING CHARGE OF WEIGHT

The need for self-control has never been greater when it comes to maintaining a healthy weight. According to the Centers for Disease Control and Prevention, two-thirds of Americans are now overweight, and one-third qualify as obese.[45] This epidemic has developed just in the past twenty-five years. The costs are astronomical. Consequence-based strategies can help.

Extra rewards. Over time, the natural reinforcers of feeling better and losing weight may be all you need to exercise and eat right. But artificial rewards can boost motivation. I work out with free weights at home twice a week, for example, but I used to make excuses to myself and skip some sessions. Now I read for fun during the short rest periods between sets and I perform this workout more reliably.

More extra rewards. New recipes for healthy foods can make them taste better, and that can make a big difference. (I've come to love vegetarian cookbooks.)

Positive signals. Some dieters post refrigerator photos of themselves

when they were thinner. Negative signals can work, too: dieters leave the room when scrumptious TV restaurant ads come on. Yes, watching them can make you feel hungry (see chapter 8).

Charting/models. For youngsters up to age eleven, the award-winning Food Dudes program features healthy-eating cartoon role models and a flexible variety of rewards and progress charts for trying fruits and vegetables. Artificial rewards are discontinued when the natural rewards take over. Enough research has documented the program's success that Ireland now uses it in all its elementary schools.[46]

Charting. From expert Miriam Nelson, "Study after study has shown that if you record your progress in a fitness program, you're much more likely to be successful."[47] Likewise, one study found that, while instructions alone increased the amount of swimming that children on a team did, recording their progress at the end of each session was more successful.[48]

Schedules. In chapter 5, a boy getting physical therapy exercised more on a variable-ratio schedule—"an enjoyable game"—than an equivalent fixed ratio. (This should no longer be surprising.) Similarly, obese boys exercised more on a variable schedule than on a comparable fixed one.[49] Easy, this one.

Here is an example that may be less easy to follow: one of my friends and colleagues tried progressive schedules to help him exercise more. It's akin to shaping: he started at twenty pool lengths per swim and increased that number by 10 percent with each new session until he was up to a mile—seventy-two lengths. Surprisingly, he described the experience as "painless." No doubt this can be easier than it sounds, but do try to keep your target and your step-up rate realistic.

Commitment/social support. New apps like the free weight-loss program "Lose It!" (www.loseit.com) take a positive approach, including commitment and social support, checklists and charts, and a variety of "gamification"-type rewards.

Finally, Yale behavioral economist Ian Ayres cofounded stickK.com to help people with their self-control challenges. Any goal is legit: learning a new language, quitting smoking, spending time with family. The most popular is losing weight.

The stickK behavioral contracting system relies more on negatives than

positives. For example, you can put up money that will be donated if you fail to reach a weekly weight goal. The funds can go to your grandma, a favorite charity, or an anti-charity—a charity of whose goals you disapprove. StickK simply manages the transactions. For accountability, an agreed-upon referee can check whether you meet your goals. For social support, you can list friends, relatives, and coworkers who will be informed of your progress—and your failures.

It's a potent combination. At this writing, in less than four years stickK handled over 100,000 contracts and more than $9 million, and dieters lost many thousands of pounds. Not surprisingly, Ayres reported that contractors were more successful when they put up more money, utilized a referee, and had more supporters cheering them on.[50]

Ayres himself used the site to drop some weight, putting up $500 each week to be donated if he hadn't lost at least one pound. It worked so well that he didn't lose a dime. By continuing on a weight-maintenance contract, he has successfully maintained a healthy weight, thereby avoiding the yo-yo weight cycling that bedevils so many dieters.[51]



Victory over self just got a little less hard.