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CHAPTER 7

# The Problem of Procrastination and Self-Control

*Why We Can't Make Ourselves Do  
What We Want to Do*

Onto the American scene, populated by big homes, big cars, and big-screen plasma televisions, comes another big phenomenon: the biggest decline in the personal savings rate since the Great Depression.

Go back 25 years, and double-digit savings rates were the norm. As recently as 1994 the savings rate was nearly five percent. But by 2006 the savings rate had fallen below zero—to negative one percent. Americans were not only not saving; they were spending more than they earned. Europeans do a lot better—they save an average of 20 percent. Japan's rate is 25 percent. China's is 50 percent. So what's up with America?

I suppose one answer is that Americans have succumbed to rampant consumerism. Go back to a home built before we

had to have everything, for instance, and check out the size of the closets. Our house in Cambridge, Massachusetts, for example, was built in 1890. It has no closets whatsoever. Houses in the 1940s had closets barely big enough to stand in. The closet of the 1970s was a bit larger, perhaps deep enough for a fondue pot, a box of eight-track tapes, and a few disco dresses. But the closet of today is a different breed. "Walk-in closet" means that you can literally walk in for quite a distance. And no matter how deep these closets are, Americans have found ways to fill them right up to the closet door.

Another answer—the other half of the problem—is the recent explosion in consumer credit. The average American family now has six credit cards (in 2005 alone, Americans received 6 billion direct-mail solicitations for credit cards). Frighteningly, the average family debt on these cards is about \$9,000; and seven in 10 households borrow on credit cards to cover such basic living expenses as food, utilities, and clothing.

So wouldn't it just be wiser if Americans learned to save, as in the old days, and as the rest of the world does, by diverting some cash to the cookie jar, and delaying some purchases until we can really afford them? Why can't we save part of our paychecks, as we know we should? Why can't we resist those new purchases? Why can't we exert some good old-fashioned self-control?

The road to hell, they say, is paved with good intentions. And most of us know what that's all about. We promise to save for retirement, but we spend the money on a vacation. We vow to diet, but we surrender to the allure of the dessert cart. We promise to have our cholesterol checked regularly, and then we cancel our appointment.

How much do we lose when our fleeting impulses deflect

us from our long-term goals? How much is our health affected by those missed appointments and our lack of exercise? How much is our wealth reduced when we forget our vow to save more and consume less? Why do we lose the fight against procrastination so frequently?

IN CHAPTER 6 we discussed how emotions grab hold of us and make us view the world from a different perspective. Procrastination (from the Latin *pro*, meaning *for*; and *cras*, meaning *tomorrow*) is rooted in the same kind of problem. When we promise to save our money, we are in a cool state. When we promise to exercise and watch our diet, again we're cool. But then the lava flow of hot emotion comes rushing in: just when we promise to save, we see a new car, a mountain bike, or a pair of shoes that we must have. Just when we plan to exercise regularly, we find a reason to sit all day in front of the television. And as for the diet? I'll take that slice of chocolate cake and begin the diet in earnest tomorrow. Giving up on our long-term goals for immediate gratification, my friends, is procrastination.

As a university professor, I'm all too familiar with procrastination. At the beginning of every semester my students make heroic promises to themselves—vowing to read their assignments on time, submit their papers on time, and in general, stay on top of things. And every semester I've watched as temptation takes them out on a date, over to the student union for a meeting, and off on a ski trip in the mountains—while their workload falls farther and farther behind. In the end, they wind up impressing me, not with their punctuality, but with their creativity—inventing stories, excuses, and family tragedies to explain their tardiness. (Why

do family tragedies generally occur during the last two weeks of the semester?)

After I'd been teaching at MIT for a few years, my colleague Klaus Wertenbroch (a professor at INSEAD, a business school with campuses in France and Singapore) and I decided to work up a few studies that might get to the root of the problem, and just maybe offer a fix for this common human weakness. Our guinea pigs this time would be the delightful students in my class on consumer behavior.

As they settled into their chairs that first morning, full of anticipation (and, no doubt, with resolutions to stay on top of their class assignments), the students listened to me review the syllabus for the course. There would be three main papers over the 12-week semester, I explained. Together, these papers would constitute much of their final grade.

"And what are the deadlines?" asked one of them, waving his hand from the back. I smiled. "You can hand in the papers at any time before the end of the semester," I replied. "It's entirely up to you." The students looked back blankly.

"Here's the deal," I explained. "By the end of the week, you must commit to a deadline date for each paper. Once you set your deadlines, they can't be changed." Late papers, I added, would be penalized at the rate of one percent off the grade for each day late. The students could always turn in their papers before their deadlines without penalty, of course, but since I wouldn't be reading any of them until the end of the semester, there would be no particular advantage in terms of grades for doing so.

In other words, the ball was in their court. Would they have the self-control to play the game?

"But Professor Ariely," asked Gaurav, a clever master's student with a charming Indian accent, "given these instruc-

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tions and incentives, wouldn't it make sense for us to select the last date possible?"

"You can do that," I replied. "If you find that it makes sense, by all means do it."

Under these conditions, what would you have done?

I promise to submit paper 1 on week \_\_\_\_\_

I promise to submit paper 2 on week \_\_\_\_\_

I promise to submit paper 3 on week \_\_\_\_\_

What deadlines did the students pick for themselves? A perfectly rational student would follow Gaurav's advice and set all the deadlines for the last day of class—after all, it was always possible to submit papers earlier without a penalty, so why take a chance and select an earlier deadline than needed? Delaying the deadlines to the end was clearly the best decision if students were perfectly rational. But what if the students are not rational? What if they succumb to temptation and are prone to procrastination? What if they realize their weakness? If the students are not rational, and they know it, they could use the deadlines to force themselves to behave better. They could set early deadlines and by doing so force themselves to start working on the projects earlier in the semester.

What did my students do? They used the scheduling tool I provided them with and spaced the timing of their papers across the whole semester. This is fine and good, as it suggests that the students realize their problems with procrastination and that if given the right opportunities they try to control themselves—but the main question is whether the tool was indeed helpful in improving their grades. To find out about this, we had to conduct other variations of the

same experiments in other classes and compare the quality of papers across the different conditions (classes).

NOW THAT I had Gaurav and his classmates choosing their individual deadlines, I went to my other two classes—with markedly different deals. In the second class, I told the students that they would have no deadlines at all during the semester. They merely needed to submit their papers by the end of the last class. They could turn the papers in early, of course, but there was no grade benefit to doing so. I suppose they should have been happy: I had given them complete flexibility and freedom of choice. Not only that, but they also had the lowest risk of being penalized for missing an intermediate deadline.

The third class received what might be called a dictatorial treatment: I dictated three deadlines for the three papers, set at the fourth, eighth, and twelfth weeks. These were my marching orders, and they left no room for choice or flexibility.

Of these three classes, which do you think achieved the best final grades? Was it Gaurav and his classmates, who had some flexibility? Or the second class, which had a single deadline at the end, and thus complete flexibility? Or the third class, which had its deadlines dictated from above, and therefore had no flexibility? Which class do you predict did worst?

When the semester was over, Jose Silva, the teaching assistant for the classes (himself an expert on procrastination and currently a professor at the University of California at Berkeley), returned the papers to the students. We could at last compare the grades across the three different deadline conditions. We found that the students in the class with the

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three firm deadlines got the best grades; the class in which I set no deadlines at all (except for the final deadline) had the worst grades; and the class in which Gaurav and his classmates were allowed to choose their own three deadlines (but with penalties for failing to meet them) finished in the middle, in terms of their grades for the three papers and their final grade.

What do these results suggest? First, that students do procrastinate (big news); and second, that tightly restricting their freedom (equally spaced deadlines, imposed from above) is the best cure for procrastination. But the biggest revelation is that simply offering the students a tool by which they could precommit to deadlines helped them achieve better grades.

What this finding implies is that the students generally understood their problem with procrastination and took action to fight it when they were given the opportunity to do so, achieving relative success in improving their grades. But why were the grades in the self-imposed deadlines condition not as good as the grades in the dictatorial (externally imposed) deadlines condition? My feeling is this: not everyone understands their tendency to procrastinate, and even those who do recognize their tendency to procrastinate may not understand their problem completely. Yes, people may set deadlines for themselves, but not necessarily the deadlines that are best for getting the best performance.

When I looked at the deadlines set by the students in Gaurav's class, this was indeed the case. Although the vast majority of the students in this class spaced their deadlines substantially (and got grades that were as good as those earned by students in the dictatorial condition), some did not space their deadlines much, and a few did not space their

deadlines at all. These students who did not space their deadlines sufficiently pulled the average grades of this class down. Without properly spaced deadlines—deadlines that would have forced the students to start working on their papers earlier in the semester—the final work was generally rushed and poorly written (even without the extra penalty of one percent off the grade for each day of delay).

Interestingly, these results suggest that although almost everyone has problems with procrastination, those who recognize and admit their weakness are in a better position to utilize available tools for precommitment and by doing so, help themselves overcome it.

SO THAT WAS my experience with my students. What does it have to do with everyday life? A lot, I think. Resisting temptation and instilling self-control are general human goals, and repeatedly failing to achieve them is a source of much of our misery. When I look around, I see people trying their best to do the right thing, whether they are dieters vowing to avoid a tempting dessert tray or families vowing to spend less and save more. The struggle for control is all around us. We see it in books and magazines. Radio and television airwaves are choked with messages of self-improvement and help.

And yet, for all this electronic chatter and focus in print, we find ourselves again and again in the same predicament as my students—failing over and over to reach our long-term goals. Why? Because without precommitments, we keep on falling for temptation.

What's the alternative? From the experiments that I have described above, the most obvious conclusion is that when an authoritative "external voice" gives the orders, most of us



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will jump to attention. After all, the students for whom I set the deadlines—for whom I provided the “parental” voice—did best. Of course, barking orders, while very effective, may not always be feasible or desirable. What’s a good compromise? It seems that the best course might be to give people an opportunity to commit up front to their preferred path of action. This approach might not be as effective as the dictatorial treatment, but it can help push us in the right direction (perhaps even more so if we train people to do it, and give them experience in setting their own deadlines).

What’s the bottom line? We have problems with self-control, related to immediate and delayed gratification—no doubt there. But each of the problems we face has potential self-control mechanisms, as well. If we can’t save from our paycheck, we can take advantage of our employer’s automatic deduction option; if we don’t have the will to exercise regularly alone, we can make an appointment to exercise in the company of our friends. These are the tools that we can commit to in advance, and they may help us be the kind of people we want to be.

WHAT OTHER PROCRASTINATION problems might precommitment mechanisms solve? Consider health care and consumer debt.

### **Health Care**

Everyone knows that preventive medicine is generally more cost-effective—for both individuals and society—than our current remedial approach. Prevention means getting health exams on a regular basis, before problems develop. But having a colonoscopy or mammogram is an ordeal. Even a cholesterol

check, which requires blood to be drawn, is unpleasant. So while our long-term health and longevity depend on undergoing such tests, in the short term we procrastinate and procrastinate and procrastinate.

But can you imagine if we all got the required health exams on time? Think how many serious health problems could be caught if they were diagnosed early. Think how much cost could be cut from health-care spending, and how much misery would be saved in the process.

So how do we fix this problem? Well, we could have a dictatorial solution, in which the state (in the Orwellian sense) would dictate our regular checkups. That approach worked well with my students, who were given a deadline and performed well. In society, no doubt, we would all be healthier if the health police arrived in a van and took procrastinators to the ministry of cholesterol control for blood tests.

This may seem extreme, but think of the other dictates that society imposes on us for our own good. We may receive tickets for jaywalking, and for having our seat belts unsecured. No one thought 20 years ago that smoking would be banned in most public buildings across America, as well as in restaurants and bars, but today it is—with a hefty fine incurred for lighting up. And now we have the movement against trans fats. Should people be deprived of heart-clogging french fries?

Sometimes we strongly support regulations that restrain our self-destructive behaviors, and at other times we have equally strong feelings about our personal freedom. Either way, it's always a trade-off.

But if mandatory health checkups won't be accepted by the public, what about a middle ground, like the self-imposed deadlines I gave to Gaurav and his classmates (the deadlines

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that offered personal choice, but also had penalties attached for the procrastinators)? This might be the perfect compromise between authoritarianism, on the one hand, and what we have too often in preventive health today—complete freedom to fail.

Suppose your doctor tells you that you need to get your cholesterol checked. That means fasting the night before the blood test, driving to the lab the next morning without breakfast, sitting in a crowded reception room for what seems like hours, and finally, having the nurse come and get you so that she can stick a needle into your arm. Facing those prospects, you immediately begin to procrastinate. But suppose the doctor charged you an up-front \$100 deposit for the test, refundable only if you showed up promptly at the appointed time. Would you be more likely to show up for the test?

What if the doctor asked you if you would like to pay this \$100 deposit for the test? Would you accept this self-imposed challenge? And if you did, would it make you more likely to show up for the procedure? Suppose the procedure was more complicated: a colonoscopy, for instance. Would you be willing to commit to a \$200 deposit, refundable only if you arrived at the appointment on time? If so, you will have replicated the condition that I offered Gaurav's class, a condition that certainly motivated the students to be responsible for their own decisions.

HOW ELSE COULD we defeat procrastination in health care? Suppose we could repackage most of our medical and dental procedures so that they were predictable and easily done. Let me tell you a story that illustrates this idea.

Several years ago, Ford Motor Company struggled to find

the best way to get car owners back into the dealerships for routine automobile maintenance. The problem was that the standard Ford automobile had something like 18,000 parts that might need servicing, and unfortunately they didn't all need servicing at the same time (one Ford engineer determined that a particular axle bolt needed inspection every 3,602 miles). And this was just part of the problem: since Ford had more than 20 vehicle types, plus various model years, the servicing of them all was nearly impossible to ponder. All that consumers, as well as service advisers, could do was page through volumes of thick manuals in order to determine what services were needed.

But Ford began to notice something over at the Honda dealerships. Even though the 18,000 or so parts in Honda cars had the same ideal maintenance schedules as the Ford cars, Honda had lumped them all into three "engineering intervals" (for instance, every six months or 5,000 miles, every year or 10,000 miles, and every two years or 25,000 miles). This list was displayed on the wall of the reception room in the service department. All the hundreds of service activities were boiled down to simple, mileage-based service events that were common across all vehicles and model years. The board had every maintenance service activity bundled, sequenced, and priced. Anyone could see when service was due and how much it would cost.

But the bundle board was more than convenient information: It was a true procrastination-buster, as it instructed customers to get their service done at specific times and mileages. It guided them along. And it was so simple that any customer could understand it. Customers were no longer confused. They no longer procrastinated. Servicing their Hondas on time was easy.

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Some people at Ford thought this was a great idea, but at first the Ford engineers fought it. They had to be convinced that, yes, drivers could go 9,000 miles without an oil change—but that 5,000 miles would align the oil change with everything else that needed to be done. They had to be convinced that a Mustang and a F-250 Super Duty truck, despite their technological differences, could be put on the same maintenance schedule. They had to be convinced that rebundling their 18,000 maintenance options into three easily scheduled service events—making maintenance as easy as ordering a Value Meal at McDonald's—was not bad engineering, but good customer service (not to mention good business). The winning argument, in fact, was that it is better to have consumers service their vehicles at somewhat compromised intervals than not to service them at all!

In the end, it happened: Ford joined Honda in bundling its services. Procrastination stopped. Ford's service bay, which had been 40 percent vacant, filled up. The dealers made money, and in just three years Ford matched Honda's success in the service bay.

So couldn't we make comprehensive physicals and tests as simple—and, with the addition of self-imposed financial penalties (or better, a "parental" voice), bring the quality of our health way up and at the same time make the overall costs significantly less? The lesson to learn from Ford's experience is that bundling our medical tests (and procedures) so that people remember to do them is far smarter than adhering to an erratic series of health commands that people are unwilling to follow. And so the big question: can we shape America's medical morass and make it as easy as ordering a Happy Meal? Thoreau wrote, "Simplify! Simplify!" And, indeed, simplification is one mark of real genius.

### Savings

We could order people to stop spending, as an Orwellian edict. This would be similar to the case of my third group of students, for whom the deadline was dictated by me. But are there cleverer ways to get people to monitor their own spending? A few years ago, for instance, I heard about the "ice glass" method for reducing credit card spending. It's a home remedy for impulsive spending. You put your credit card into a glass of water and put the glass in the freezer. Then, when you impulsively decide to make a purchase, you must first wait for the ice to thaw before extracting the card. By then, your compulsion to purchase has subsided. (You can't just put the card in the microwave, of course, because then you'd destroy the magnetic strip.)

But here's another approach that is arguably better, and certainly more up-to-date. John Leland wrote a very interesting article in the *New York Times* in which he described a growing trend of self-shame: "When a woman who calls herself Tricia discovered last week that she owed \$22,302 on her credit cards, she could not wait to spread the news. Tricia, 29, does not talk to her family or friends about her finances, and says she is ashamed of her personal debt. Yet from the laundry room of her home in northern Michigan, Tricia does something that would have been unthinkable—and impossible—a generation ago: She goes online and posts intimate details of her financial life, including her net worth (now a negative \$38,691), the balance and finance charges on her credit cards, and the amount of debt she has paid down (\$15,312) since starting the blog about her debt last year."

It is also clear that Tricia's blog is part of a larger trend. Apparently, there are dozens of Web sites (maybe there are

thousands by now) devoted to the same kind of debt blogging (from "Poorer than You" poorerthanyou.com and "We're in Debt" wereindebt.com to "Make Love Not Debt" makelovenotdebt.com and Tricia's Web page: bloggingawaydebt.com). Leland noted, "Consumers are asking others to help themselves develop self-control because so many companies are not showing any restraint."<sup>7</sup>

Blogging about overspending is important and useful, but as we saw in the last chapter, on emotions, what we truly need is a method to curb our consumption at the moment of temptation, rather than a way to complain about it after the fact.

What could we do? Could we create something that replicated the conditions of Gaurav's class, with some freedom of choice but built-in boundaries as well? I began to imagine a credit card of a different kind—a *self-control* credit card that would let people restrict their own spending behavior. The users could decide in advance how much money they wanted to spend in each category, in every store, and in every time frame. For instance, users could limit their spending on coffee to \$20 every week, and their spending on clothing to \$600 every six months. Cardholders could fix their limit for groceries at \$200 a week and their entertainment spending at \$60 a month, and not allow any spending on candy between two and five PM. What would happen if they surpassed the limit? The cardholders would select their penalties. For instance, they could make the card get rejected; or they could tax themselves and transfer the tax to Habitat for Humanity, a friend, or long-term savings. This system could also implement the "ice glass" method as a cooling-off period for large items; and it could even automatically trigger an e-mail to your spouse, your mother, or a friend:

predictably irrational.

Dear Sumi,

This e-mail is to draw your attention to the fact that your husband, Dan Ariely, who is generally an upright citizen, has exceeded his spending limit on chocolate of \$50 per month by \$73.25.

With best wishes,

The self-control credit card team

Now this may sound like a pipe dream, but it isn't. Think about the potential of Smart Cards (thin, palm-size cards that carry impressive computational powers), which are beginning to fill the market. These cards offer the possibility of being customized to each individual's credit needs and helping people manage their credit wisely. Why couldn't a card, for instance, have a spending "governor" (like the governors that limit the top speed on engines) to limit monetary transactions in particular conditions? Why couldn't they have the financial equivalent of a time-release pill, so that consumers could program their cards to dispense their credit to help them behave as they hope they would?

A FEW YEARS ago I was so convinced that a "self-control" credit card was a good idea that I asked for a meeting with one of the major banks. To my delight, this venerable bank responded, and suggested that I come to its corporate headquarters in New York.

I arrived in New York a few weeks later, and after a brief delay at the reception desk, was led into a modern conference room. Peering through the plate glass from on high, I could look down on Manhattan's financial district and a stream of yellow cabs pushing through the rain. Within a few minutes



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the room had filled with half a dozen high-powered banking executives, including the head of the bank's credit card division.

I began by describing how procrastination causes everyone problems. In the realm of personal finance, I said, it causes us to neglect our savings—while the temptation of easy credit fills our closets with goods that we really don't need. It didn't take long before I saw that I was striking a very personal chord with each of them.

Then I began to describe how Americans have fallen into a terrible dependence on credit cards, how the debt is eating them alive, and how they are struggling to find their way out of this predicament. America's seniors are one of the hardest-hit groups. In fact, from 1992 to 2004 the rate of debt of Americans age 55 and over rose faster than that of any other group. Some of them were even using credit cards to fill the gaps in their Medicare. Others were at risk of losing their homes.

I began to feel like George Bailey begging for loan forgiveness in *It's a Wonderful Life*. The executives began to speak up. Most of them had stories of relatives, spouses, and friends (not themselves, of course) who had had problems with credit debt. We talked it over.

Now the ground was ready and I started describing the self-control credit card idea as a way to help consumers spend less and save more. At first I think the bankers were a bit stunned. I was suggesting that they help consumers control their spending. Did I realize that the bankers and credit card companies made \$17 billion a year in interest from these cards? Hello? They should give that up?

Well, I wasn't that naive. I explained to the bankers that there was a great business proposition behind the idea of a

self-control card. "Look," I said, "the credit card business is cutthroat. You send out six billion direct-mail pieces a year, and all the card offers are about the same." Reluctantly, they agreed. "But suppose one credit card company stepped out of the pack," I continued, "and identified itself as a good guy—as an advocate for the credit-crunched consumer? Suppose one company had the guts to offer a card that would actually help consumers control their credit, and better still, divert some of their money into long-term savings?" I glanced around the room. "My bet is that thousands of consumers would cut up their other credit cards—and sign up with you!"

A wave of excitement crossed the room. The bankers nodded their heads and chatted to one another. It was revolutionary! Soon thereafter we all departed. They shook my hand warmly and assured me that we would be talking again, soon.

Well, they never called me back. (It might have been that they were worried about losing the \$17 billion in interest charges, or maybe it was just good old procrastination.) But the idea is still there—a self-control credit card—and maybe one day someone will take the next step.

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### **Reflections on Immediate Gratification and Self-Control**

Oscar Wilde once said, "I never put off till tomorrow what I can do the day after." He seemed to accept and even embrace the role of procrastination in his life, but most of us find the allure of immediate gratification so strong that it wrecks our best-laid plans for dieting, saving money, cleaning the house—the list is endless.

When we have problems with self-control, sometimes we

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delay tasks that we should do immediately. But we also exhibit problems with self-control when we attend too frequently to tasks that we should put off—such as obsessively checking our e-mail.

The danger of continually checking e-mail was crucial in the plotline of the movie *Seven Pounds*: Will Smith's character checks his phone for e-mail while driving and veers head-on into an oncoming van, killing his wife and six other people. This is just a movie, of course, but compulsively checking e-mail while driving is more common than most of us would care to admit (go ahead, raise your hand\*).

I hope that you're not that addicted to e-mail, but too many of us suffer from an unhealthy attachment to it. A recent Australian report found that workers spent an average of 14.5 hours, or more than two working days a week, checking, reading, arranging, deleting, and responding to e-mail.<sup>8</sup> Add to this the rise of social networks and news groups, and you can most likely double the time we spend in virtual interaction and message management.

I, for one, have very mixed feelings about e-mail. On one hand, it lets me communicate with colleagues and friends all over the world without the delays of snail mail or the constraints of talking on the phone. (Is it too late to call? What time is it in Auckland anyway?) On the other hand, I receive hundreds of messages a day, including many involving things I don't really care about (announcements, minutes of meetings, and so on). Regardless of whether I care, the ongoing stream of e-mail is a constant distraction.

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\*I teach about 200 graduate students each year, and in early 2009 I asked for a show of hands to the question of how many students had ever used e-mail or text messaging while driving. All but three raised their hands (and one of the three who did not was visually impaired!).

I once tried to overcome this distraction by resolving to check e-mail only at night, but I quickly discovered that this would not do. Other people expected me to do as they do—check e-mail constantly and rely on it as a sole means of communication. As a result of not checking my e-mail regularly, I ended up going to meetings that had been canceled, or arriving at the wrong time or place. So I gave in, and now I check e-mail way too often, and as I do I constantly sort the messages into categories: spam and unimportant e-mail that I delete right away; messages I might care about or need to respond to at some point in the future; messages I need to respond to immediately; and so on.

In bygone days the mail cart came around the office once or twice a day with a few letters and memos—not so with e-mail, which never takes a break. For me, the day goes like this: I start working on something and get deeply into it. Eventually I get stuck on some difficult point, and decide to take a quick break—obviously, to check e-mail. Twenty minutes later I get back to the task, with little recollection of where I was and what I was thinking. By the time I'm back on track, I've lost both time and some of my focus, and this outcome assuredly does not help me solve whatever problem caused me to take five in the first place.

Sadly, this is not where the story ends. Enter smart phones—an even greater time sink. A while ago I got one of these lovely, distracting gadgets in the form of an iPhone, which meant that I could also check e-mail while waiting in a checkout line, walking into the office, riding in the elevator, while listening to other people's lectures (I haven't yet figured out how to do this during my own lectures), and even while sitting at traffic lights. In truth, the iPhone has made the level of my addiction very clear. I check it almost ceaselessly. (Businesspeople recognize

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the addictive properties of these devices: this is why they often call their BlackBerries "CrackBerries.")

I THINK E-MAIL addiction has something to do with what the behavioral psychologist B. F. Skinner called "schedules of reinforcement." Skinner used this phrase to describe the relationship between actions (in his case, a hungry rat pressing a lever in a so-called Skinner box) and their associated rewards (pellets of food). In particular, Skinner distinguished between fixed-ratio schedules of reinforcement and variable-ratio schedules of reinforcement. Under a fixed schedule, a rat received a reward of food after it pressed the lever a fixed number of times—say 100 times. (To make a human comparison, a used-car dealer might get a \$1,000 bonus for every 10 cars sold.) Under the variable schedule, the rat earned the food pellet after it pressed the lever a random number of times. Sometimes it would receive the food after pressing 10 times, and sometimes after pressing 200 times. (Analogously, our used-car dealer would earn a \$1,000 bonus after selling an unknown number of cars.)

Thus, under the variable schedule of reinforcement, the arrival of the reward is unpredictable. On the face of it, one might expect that the fixed schedules of reinforcement would be more motivating and rewarding because the rat (or the used-car dealer) can learn to predict the outcome of his work. Instead, Skinner found that the variable schedules were actually more motivating. The most telling result was that when the rewards ceased, the rats who were under the fixed schedules stopped working almost immediately, but those under the variable schedules kept working for a very long time.

This variable schedule of reinforcement also works wonders for motivating people. It is the magic (or, more accurately, dark magic) that underlies gambling and playing the lottery. How much fun would it be to play a slot machine if you knew in advance that you would always lose nine times before winning once, and that this sequence would continue for as long as you played? It would probably be no fun at all! In fact, the joy of gambling comes from the inability to predict when rewards are coming, so we keep playing.

So, what do food pellets and slot machines have to do with e-mail? If you think about it, e-mail is very much like gambling. Most of it is junk and the equivalent to pulling the lever of a slot machine and losing, but every so often we receive a message that we really want. Maybe it contains good news about a job, a bit of gossip, a note from someone we haven't heard from in a long time, or some important piece of information. We are so happy to receive the unexpected e-mail (pellet) that we become addicted to checking, hoping for more such surprises. We just keep pressing that lever, over and over again, until we get our reward.

This explanation gives me a better understanding of my e-mail addiction, and more important, it might suggest a few means of escape from this Skinner box and its variable schedule of reinforcement. One helpful approach I've discovered is to turn off the automatic e-mail-checking feature. This action doesn't eliminate my checking, but it reduces the frequency with which my computer notifies me that I have new e-mail waiting (some of it, I would think to myself, must be interesting or relevant). Additionally, many applications allow users to link different colors and sounds to different incoming e-mail. For example, I assign every e-mail on which I'm cc'd to the color gray, and send it directly to a folder la-

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beled "Later." Similarly, I set my application to play a particularly cheerful sound when I receive a message from a source I've marked as urgent and important (these include messages from my wife, students, or members of my department). Sure, it takes some time to set up such filters, but having once gone to the trouble of doing so, I've reduced the randomness of the reward, made the schedule of reinforcement more fixed, and ultimately improved my life. As for overcoming the temptations of checking my iPhone too frequently—I am still working on that one.

### **Further Reflection on Self-Control: The Lesson of Interferon**

Several years ago I heard an interview on NPR with the Delany sisters, who lived to be 102 and 104. There was one particular part of the interview that remained with me. The sisters said that one of their secrets for a long life was never marrying, because they never had husbands to "worry them to death." This sounds reasonable enough, but it isn't something to which I can personally attest (and it also turns out that men benefit more from marriage anyway).<sup>9</sup> One of the sisters said that another secret was to avoid hospitals, which seemed sensible for two reasons—if you're healthy in the first place, you don't need to go, and you're also less likely to catch an illness from being in the hospital.

I certainly understood what she was talking about. When I was first hospitalized for my burns, I acquired hepatitis from a blood transfusion. Obviously, there's no good time to get hepatitis, but the timing could not have been worse for me. The disease increased the risks of my operations, delayed my treatment, and caused my body to reject many of the skin

transplants. After a while the hepatitis subsided, but it still slowed my recovery by flaring up from time to time and wreaking havoc on my system.

This was in 1985, before my type of hepatitis had been isolated; the doctors knew it wasn't hepatitis A or B, but it remained a mystery, so they just called it non-A-non-B hepatitis. In 1993, when I was in graduate school, I had a flare-up; I checked into the student health center and the doctor told me I had hepatitis C, which had recently been isolated and identified. This was good news for two reasons. First, I now knew what I had, and second, a new experimental treatment, interferon, looked promising. Given the threat of liver fibrosis, cirrhosis, and the possibility of early death from hepatitis C, it seemed to me that being part of an experimental study was clearly the lesser of two evils.

Interferon was initially approved by the FDA for treatment of hairy cell leukemia (which has no other real treatment) and, as is often the case with cancer therapy, the treatment regimen was particularly distasteful. The initial protocol called for self-injections of interferon three times a week. I was warned that after each injection I would experience fever, nausea, headaches, and vomiting, and this warning was accurate. So, for six months on Mondays, Wednesdays, and Fridays I would arrive home from school, take the needle from the medicine cabinet, open the refrigerator, load the syringe with the right dosage of interferon, and plunge the needle into my thigh. Then I would lie down in the big hammock—the only interesting piece of furniture in my loft-like student apartment—from which I had a perfect view of the television. I kept a bucket within reach to catch the vomit that would inevitably come up, after which the fever, shivering, and headache would begin. At some point I would fall



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asleep and wake up aching with flulike symptoms. By noon I would be more or less OK and would go back to work.

The difficulty that I, and the rest of the patients, had with the interferon was the basic problem of delayed gratification and self-control. On every injection day I was faced with a trade-off between giving myself an injection and feeling sick for the next 16 hours (a negative immediate effect), and the hope that the treatment would cure me in the long term (a positive long-term effect). At the end of the six-month trial the doctors told me that I was the only patient in the protocol who had followed the regimen in the way they designed it. Everyone else in the study skipped the medication numerous times, which was hardly surprising, given the challenges. (Lack of medical compliance is, in fact, a very pervasive problem.)

So how did I do it? Did I simply have nerves of steel? No. Like anyone else, I have plenty of problems with self-control. But I did have a trick. I basically tried to harness my other desires in an effort to make the prospect of the terrible injection more bearable. For me, the key was movies.

I love movies. If I had the time, I would watch one every day. When the doctors told me what to expect, I decided that I would not watch any movies until after I injected myself, and then I could watch as many as I wanted until I fell asleep.

On every injection day, I would stop at the video store on the way to school and pick up a few films that I wanted to see. I would have these in my bag and would eagerly anticipate watching them later that day. Then, immediately after I took the injection, but before the shivering and headache set in, I jumped into my hammock, got comfortable, made sure the bucket was in position, and started my mini-film fest. This way, I learned to associate the initial injection with the

rewarding experience of watching a wonderful movie. Only an hour later, after the negative side effects kicked in, did I have a less than wonderful feeling about it.

Planning my evenings in this way helped my brain associate the injection more closely with the movie than with the fever, chills, and vomiting, and thus, I was able to continue the treatment.

DURING THE SIX-MONTH treatment, it looked as though the interferon was working, and my liver function improved dramatically. Unfortunately, a few weeks after the trial was over, the hepatitis returned, so I started a more aggressive treatment. This one lasted a year and involved not only interferon but also a drug called ribavirin. To compel myself to follow this treatment, I again tried the injection-movie-hammock procedure as before. (Thanks to my somewhat faulty memory, I was even able to enjoy some of the same movies I had watched during the first treatment with interferon.)

This time, however, I was also interviewing at various universities for a job as an assistant professor. I had to travel to 14 cities, stay overnight in hotels, give a talk to groups of academics, and then submit to one-on-one interviews with professors and deans. To avoid telling my prospective colleagues about my adventures with interferon and ribavirin, I would insist on a rather strange schedule of interviews. I routinely had to make some excuse about why I arrived early the day before the interview but could not go out for dinner that evening with my hosts. Instead, I would check into the hotel, take out the injection from a little icebox that I carried with me, inject myself, and watch a few movies on the hotel televi-

sion. The following day I would also try to delay the interviews for a few hours, but once I felt better I would go through the interview as best I could. (Sometimes my procedure worked; sometimes I had to meet people while I still felt wretched.) Fortunately, after I finished my interviews I received excellent news. Not only had I been offered a job, but the combination treatment had eliminated the hepatitis from my liver. I've been hepatitis-free ever since.

THE LESSON I took away from my interferon treatment is a general one: if a particular desired behavior results in an immediate negative outcome (punishment), this behavior will be very difficult to promote, even if the ultimate outcome (in my case, improved health) is highly desirable. After all, that's what the problem of delayed gratification is all about. Certainly, we know that exercising regularly and eating more vegetables will help us be healthier, even if we don't live to be as old as the Delany sisters; but because it is very hard to hold a vivid image of our future health in our mind's eye, we can't keep from reaching for the doughnuts.

In order to overcome many types of human fallibility, I believe it's useful to look for tricks that match immediate, powerful, and positive reinforcements with the not-so-pleasant steps we have to take toward our long-term objectives. For me, beginning a movie—before I felt any side effects—helped me to sustain the unpleasantness of the treatment. As a matter of fact, I timed everything perfectly. The moment I finished injecting myself, I pressed the Play button. I suspect that had I hit Play after the side effects kicked in, I would not have been as successful in winning the tug-of-war. And who knows? Maybe if I had waited for the side effects to kick in before I started the

movies, I would have created a negative association and would now enjoy movies less as a consequence.\*

ONE OF MY colleagues at Duke University, Ralph Keeney, recently noted that America's top killer isn't cancer or heart disease, nor is it smoking or obesity. It's our inability to make smart choices and overcome our own self-destructive behaviors.<sup>10</sup> Ralph estimates that about half of us will make a lifestyle decision that will ultimately lead us to an early grave. And as if this were not bad enough, it seems that the rate at which we make these deadly decisions is increasing at an alarming pace.

I suspect that over the next few decades, real improvements in life expectancy and quality are less likely to be driven by medical technology than by improved decision making. Since focusing on long-term benefits is not our natural tendency, we need to more carefully examine the cases in which we repeatedly fail, and try to come up with some remedies for these situations. (For an overweight movie lover, the key might be to enjoy watching a film while walking on the treadmill.) The trick is to find the right behavioral antidote for each problem. By pairing something that we love with something that we dislike but that is good for us, we might be able to harness desire with outcome—and thus overcome some of the problems with self-control we face every day.

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\*I did experience such a negative association with eggs. Soon after I was injured, the doctors fed me thirty raw eggs daily through a feeding tube. To this day, even the smell of eggs turns me off.