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NUDGE

Improving Decisions About Health, Wealth, and Happiness

Richard H. Thaler
Cass R. Sunstein

Penguin Books
BIASES AND BLUNDERS

Have a look, if you will, at these two tables:

1.1.
Two tables (Adapted from Shepard [1990])

Suppose that you are thinking about which one would work better as a coffee table in your living room. What would you say are the dimensions of the two tables? Take a guess at the ratio of the length to the width of each. Just eyeball it.

If you are like most people, you think that the table on the left is much longer and narrower than the one on the right. Typical guesses are that the ratio of the length to the width is 3:1 for the left table and 1.5:1 for the right
These two figures capture the key insight that behavioral economists have borrowed from psychologists. Normally the human mind works remarkably well. We can recognize people we have not seen in years, understand the complexities of our native language, and run down a flight of stairs without falling. Some of us can speak twelve languages, improve the fanciest computers, and/or create the theory of relativity. However, even Einstein would probably be fooled by those tables. That does not mean something is wrong with us as humans, but it does mean that our understanding of human behavior can be improved by appreciating how people systematically go wrong.

To obtain that understanding, we need to explore some aspects of human thinking. Knowing something about the visual system allowed Roger Shepard (1990), a psychologist and artist, to draw those deceptive tables. He knew what to draw to lead our mind astray. Knowing something about the cognitive system has allowed others to discover systematic biases in the way we think.

How We Think: Two Systems

The workings of the human brain are more than a bit befuddling. How can we be so ingenious at some tasks and so clueless at others? Beethoven wrote his incredible ninth symphony while he was deaf, but we would not be at all surprised if we learned that he often misplaced his house keys. How can people be simultaneously so smart and so dumb? Many psychologists and neuroscientists have been converging on a description of the brain’s functioning that helps us make sense of these seeming contradictions. The approach involves a distinction between two kinds of thinking, one that is intuitive and automatic, and another that is reflective and rational.1 We will call the first the Automatic System and the second the Reflective System. (In the psychology literature, these two systems are sometimes referred to as System 1 and System 2, respectively.) The key features of each system are shown in Table 1.1.

The Automatic System is rapid and is or feels instinctive, and it does not involve what we usually associate with the word thinking. When you duck because a ball is thrown at you unexpectedly, or get nervous when your airplane hits turbulence, or smile when you see a cute puppy, you are using

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Table 1.1
Two cognitive systems

<table>
<thead>
<tr>
<th>Automatic System</th>
<th>Reflective System</th>
</tr>
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<tbody>
<tr>
<td>Uncontrolled</td>
<td>Controlled</td>
</tr>
<tr>
<td>Effortless</td>
<td>Effortful</td>
</tr>
<tr>
<td>Associative</td>
<td>Deductive</td>
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<tr>
<td>Fast</td>
<td>Slow</td>
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<td>Unconscious</td>
<td>Self-aware</td>
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<tr>
<td>Skilled</td>
<td>Rule-following</td>
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</table>

fancy intuitions; their Automatic Systems allow them to size up complex situations rapidly and to respond with both amazing accuracy and exceptional speed.

One way to think about all this is that the Automatic System is your gut reaction and the Reflective System is your conscious thought. Gut feelings can be quite accurate, but we often make mistakes because we rely too much on our Automatic System. The Automatic System says that “the airplane is shaking, I’m going to die,” while the Reflective System responds, “Planes are very safe!” The Automatic System says, “That big dog is going to hurt me,” and the Reflective System replies, “Most pets are quite sweet.” (In both cases, the Automatic System is squawking all the time.) The Automatic System starts out with no idea how to play golf or tennis. Note, however, that countless hours of practice enable an accomplished golfer to avoid reflection and to rely on her Automatic System—so much so that good golfers, like other good athletes, know the hazards of “thinking too much” and might well do better to “trust the gut,” or “just do it.” The Automatic System can be trained with lots of repetition—but such training takes a lot of time and effort. One reason why teenagers are such risky drivers is that their Automatic Systems have not had much practice, and using the Reflective System is much slower.

To see how intuitive thinking works, try the following little test. For each of the three questions, begin by writing down the first answer that comes to your mind. Then pause to reflect.

1. A bat and ball cost $1.10 in total. The bat costs $1.00 more than the ball. How much does the ball cost? ________ cents
2. If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets? ________ minutes
3. In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake? ________ days

What were your initial answers? Most people say 10 cents, 100 minutes, and 24 days. But all these answers are wrong. If you think for a minute, you will see why. If the ball costs 10 cents and the bat costs one dollar more than the ball, meaning $1.10, then together they cost $1.20, not $1.10. No one who bothers to check whether his initial answer of 10 cents could pos-

*It is possible to predict the outcome of congressional elections with frightening accuracy simply by asking people to look quickly at pictures of the candidates and say which one looks more competent. These judgments, by students who did not know the candidates, forecast the winner of the election two-thirds of the time! (Toderov et al. [2005]; Benjamin and Shapiro [2007])
sibly be right would give that as an answer, but research by Shane Frederick (2005) (who calls this series of questions the cognitive reflection test) finds that these are the most popular answers even among bright college students.

The correct answers are 5 cents, 5 minutes, and 47 days, but you knew that, or at least your Reflective System did if you bothered to consult it. Econ never make an important decision without checking with their Reflective Systems (if they have time). But Humans sometimes go with the answer the lizard inside is giving without pausing to think. If you are a television fan, think of Mr. Spock of Star Trek fame as someone whose Reflective System is always in control. (Captain Kirk: “You’d make a splendid computer, Mr. Spock.” Mr. Spock: “That is very kind of you, Captain!”) In contrast, Homer Simpson seems to have forgotten where he put his Reflective System. (In a commentary on gun control, Homer once replied to a gun store clerk who informed him of a mandatory five-day waiting period before buying a weapon, “Five days? But I’m mad now!”)

One of our major goals in this book is to see how the world might be made easier, or safer, for the Homers among us (and the Homer lurking somewhere in each of us). If people can rely on their Automatic Systems without getting into terrible trouble, their lives should be easier, better, and longer.

Rules of Thumb

Most of us are busy, our lives are complicated, and we can’t spend all our time thinking and analyzing everything. When we have to make judgments, such as guessing Angelina Jolie’s age or the distance between Cleveland and Philadelphia, we use simple rules of thumb to help us. We use rules of thumb because most of the time they are quick and useful.

In fact, there is a great collection edited by Tom Parker titled Rules of Thumb. Parker wrote the book by asking friends to send him good rules of thumb. For example, “One ostrich egg will serve 24 people for brunch.” “Ten people will raise the temperature of an average size room by one degree per hour.” And one to which we will return: “No more than 25 percent of the guests at a university dinner party can come from the economics department without spoiling the conversation.”

Although rules of thumb can be very helpful, their use can also lead to systematic biases. This insight, first developed decades ago by two Israeli psychologists, Amos Tversky and Daniel Kahneman (1974), has changed the way psychologists (and eventually economists) think about thinking. Their original work identified three heuristics, or rules of thumb—anchoring, availability, and representativeness—and the biases that are associated with each. Their research program has come to be known as the “heuristics and biases” approach to the study of human judgment. More recently, psychologists have come to understand that these heuristics and biases emerge from the interplay between the Automatic System and the Reflective System. Let’s see how.

**Anchoring**

Suppose we are asked to guess the population of Milwaukee, a city about two hours north of Chicago, where we live. Neither of us knows much about Milwaukee, but we think that it is the biggest city in Wisconsin. How should we go about guessing? Well, one thing we could do is start with something we do know, which is the population of Chicago, roughly three million. So we might think, Milwaukee is a major city, but clearly not as big as Chicago, so, hmm, maybe it is one-third the size, say one million. Now consider someone from Green Bay, Wisconsin, who is asked the same question. She also doesn’t know the answer, but she does know that Green Bay has about one hundred thousand people and knows that Milwaukee is larger, so guesses, say, three times larger—three hundred thousand.

This process is called “anchoring and adjustment.” You start with some anchor, the number you know, and adjust in the direction you think is appropriate. So far, so good. The bias occurs because the adjustments are typically insufficient. Experiments repeatedly show that, in problems similar to our example, people from Chicago are likely to make a high guess (based on their high anchor) while those from Green Bay guess low (based on their low anchor). As it happens, Milwaukee has about 580,000 people.4

Even obviously irrelevant anchors creep into the decision-making process. Try this one yourself. Take the last three digits of your phone number and add two hundred. Write the number down. Now, when do you think Attila the Hun sacked Europe? Was it before or after that year? What is your best guess? (We will give you one hint: It was after the birth of Jesus.) Even
if you do not know much about European history, you do know enough to
know that whenever Attila did whatever he did, the date has nothing to do
with your phone number. Still, when we conduct this experiment with our
students, we get answers that are more than three hundred years later from
students who start with high anchors rather than low ones. (The right an-
swer is 411.)

Anchors can even influence how you think your life is going. In one ex-
periment, college students were asked two questions: (a) How happy are
you? (b) How often are you dating? When the two questions were asked in
this order the correlation between the two questions was quite low (.11).
But when the question order was reversed, so that the dating question was
asked first, the correlation jumped to .62. Apparently, when prompted by
the dating question, the students use what might be called the “dating
heuristic” to answer the question about how happy they are. “Gee, I can’t
remember when I last had a date! I must be miserable.” Similar results can
be obtained from married couples if the dating question is replaced by a
lovemaking question.

In the language of this book, anchors serve as nudges. We can influence
the figure you will choose in a particular situation by ever-so-subtly sug-
gesting a starting point for your thought process. When charities ask you
for a donation, they typically offer you a range of options such as $100,
$250, $1,000, $5,000, or “other.” If the charity’s fund-raisers have an idea
of what they are doing, these values are not picked at random, because the
options influence the amount of money people decide to donate. People
will give more if the options are $100, $250, $1,000, and $5,000, than if
the options are $50, $75, $100, and $150.

In many domains, the evidence shows that, within reason, the more you
ask for, the more you tend to get. Lawyers who sue cigarette companies of-
ten win astronomical amounts, in part because they have successfully in-
duced juries to anchor on multimillion-dollar figures. Clever negotiators
often get amazing deals for their clients by producing an opening offer
that makes their adversary thrilled to pay half that very high amount.

Availability

How much should you worry about hurricanes, nuclear power, terrorism, mad cow disease, alligator attacks, or avian flu? And how much
care should you take in avoiding risks associated with each? What, exactly,
should you do to prevent the kinds of dangers that you face in ordinary
life?

In answering questions of this kind, most people use what is called
the availability heuristic. They assess the likelihood of risks by asking how
readily examples come to mind. If people can easily think of relevant ex-
amples, they are far more likely to be frightened and concerned than if they
cannot. A risk that is familiar, like that associated with terrorism in the
aftermath of 9/11, will be seen as more serious than a risk that is less familiar,
like that associated with sunbathing or hotter summers. Homicides are
more available than suicides, and so people tend to believe, wrongly, that
more people die from homicide.

Accessibility and salience are closely related to availability, and they are
important as well. If you have personally experienced a serious earthquake,
you’re more likely to believe that an earthquake is likely than if you read
about it in a weekly magazine. Thus vivid and easily imagined causes of
death (for example, tornados) often receive inflated estimates of proba-
bility, and less-vivid causes (for example, asthma attacks) receive low esti-
mates, even if they occur with a far greater frequency (here a factor of
twenty). So, too, recent events have a greater impact on our behavior, and
on our fears, than earlier ones. In all these highly available examples, the
Automatic System is keenly aware of the risk (perhaps too keenly), without
having to resort to any tables of boring statistics.

The availability heuristic helps to explain much risk-related behavior,
including both public and private decisions to take precautions. Whether
people buy insurance for natural disasters is greatly affected by recent ex-
periences. In the aftermath of an earthquake, purchases of new earth-
quake insurance policies rise sharply—but purchases decline steadily from
that point, as vivid memories recede. If floods have not occurred in the im-
mediate past, people who live on floodplains are far less likely to purchase
insurance. And people who know someone who has experienced a flood
are more likely to buy flood insurance for themselves, regardless of the
flood risk they actually face.

Biased assessments of risk can perversely influence how we prepare for
and respond to crises, business choices, and the political process. When In-
ternet stocks have done very well, people might well buy Internet stocks,
even if by that point they’ve become a bad investment. Or suppose that people falsely think that some risks (a nuclear power accident) are high, whereas others (a stroke) are relatively low. Such misperceptions can affect policy, because governments are likely to allocate their resources in a way that fits with people’s fears rather than in response to the most likely danger.

When “availability bias” is at work, both private and public decisions may be improved if judgments can be nudged back in the direction of true probabilities. A good way to increase people’s fear of a bad outcome is to remind them of a related incident in which things went wrong; a good way to increase people’s confidence is to remind them of a similar situation in which everything worked out for the best. The pervasive problems are that easily remembered events may inflate people’s probability judgments, and that if no such events come to mind, their judgments of likelihoods might be distorted downward.

**Representativeness**

The third of the original three heuristics bears an unwieldy name: representativeness. Think of it as the similarity heuristic. The idea is that when asked to judge how likely it is that A belongs to category B, people (and especially their Automatic System) answer by asking themselves how similar A is to their image or stereotype of B (that is, how “representative” A is of B). Like the other two heuristics we have discussed, this one is used because it often works. We think a 6-foot-8-inch African-American man is more likely to be a professional basketball player than a 5-foot-6-inch Jewish guy because there are lots of tall black basketball players and not many short Jewish ones (at least not these days). Stereotypes are sometimes right!

Again, biases can creep in when similarity and frequency diverge. The most famous demonstration of such biases involves the case of a hypothetical woman named Linda. In this experiment, subjects were told the following: “Linda is thirty-one years old, single, outspoken, and very bright. She majored in philosophy. As a student, she was deeply concerned with issues of discrimination and social justice and also participated in antinuclear demonstrations.” Then people were asked to rank, in order of the probability of their occurrence, eight possible futures for Linda. The two crucial answers were “bank teller” and “bank teller and active in the feminist movement.” Most people said that Linda was less likely to be a bank teller than to be a bank teller and active in the feminist movement.

This is an obvious logical mistake. It is, of course, not logically possible for any two events to be more likely than one of them alone. It just has to be the case that Linda is more likely to be a bank teller than a feminist bank teller, because all feminist bank tellers are bank tellers. The error stems from the use of the representativeness heuristic: Linda’s description seems to match “bank teller and active in the feminist movement” far better than “bank teller.” As Stephen Jay Gould (1991) once observed, “I know [the right answer], yet a little homunculus in my head continues to jump up and down, shouting at me—‘but she can’t just be a bank teller; read the description!’” Gould’s homunculus is the Automatic System in action.

Use of the representativeness heuristic can cause serious misperceptions of patterns in everyday life. When events are determined by chance, such as a sequence of coin tosses, people expect the resulting string of heads and tails to be representative of what they think of as random. Unfortunately, people do not have accurate perceptions of what random sequences look like. When they see the outcomes of random processes, they often detect patterns that they think have great meaning but in fact are just due to chance. You might flip a coin three times, see it come up heads every time, and conclude that there is something funny about the coin. But the fact is that if you flip any coin a lot, it won’t be so unusual to see three heads in a row. (Try it and you’ll see. As a little test, Sunstein, having just finished this paragraph, flipped a regular penny three times—and got heads every time. He was amazed. He shouldn’t have been.)

A less trivial example, from the Cornell psychologist Tom Gilovich (1991), comes from the experience of London residents during the German bombing campaigns of World War II. London newspapers published maps, such as the one shown in Figure 1.3, displaying the location of the strikes from German V-1 and V-2 missiles that landed in central London. As you can see, the pattern does not seem at all random. Bombs appear to be clustered around the River Thames and also in the northwest sector of the map. People in London expressed concern at the time because the pattern seemed to suggest that the Germans could aim their bombs with great precision. Some Londoners even speculated that the blank spaces
1.3.
Map of London showing V-1 rocket strikes (Adapted from Gilovich [1991])

were probably the neighborhoods where German spies lived. They were wrong. In fact the Germans could do no better than aim their bombs at Central London and hope for the best. A detailed statistical analysis of the dispersion of the location of the bomb strikes determined that within London the distribution of bomb strikes was indeed random.

Still, the location of the bomb strikes does not look random. What is going on here? We often see patterns because we construct our informal tests only after looking at the evidence. The World War II example is an excellent illustration of this problem. Suppose we divide the map into quadrants, as in Figure 1.4a. If we then do a formal statistical test—or, for the less statistically inclined, just count the number of hits in each quadrant—we do find evidence of a nonrandom pattern. However, nothing in nature suggests that this is the right way to test for randomness. Suppose instead we form the quadrants diagonally as in Figure 1.4b. We are now unable to reject the hypothesis that the bombs land at random. Unfortunately, we do not subject our own perceptions to such rigorous alternative testing.

Gilovich (with colleagues Vallone and Tversky [1985]) is also responsible for perhaps the most famous (or infamous) example of misperception of randomness, namely the widely held view among basketball fans that

1.4.
Map of London showing V-1 rocket strikes, with vertical-horizontal grid (a) and diagonal grid (b). The figures outside the grid refer to the number of dots in the quadrant. (Adapted from Gilovich [1991])
there is a strong pattern of “streak shooting.” We will not go into this in
detail, because our experience tells us that the cognitive illusion here is so
powerful that most people (influenced by their Automatic System) are un-
willing even to consider the possibility that their strongly held beliefs
might be wrong. But here is the short version. Most basketball fans think
that a player is more likely to make his next shot if he has made his last shot,
or even better, his last few shots. Players who have hit a few shots in a row,
or even most of their recent shots, are said to have a “hot hand,” which is
taken by all sports announcers to be a good signal about the future. Passing
the ball to the player who is hot is taken to be an obvious bit of good
strategy.

It turns out that the “hot hand” is just a myth. Players who have made
their last few shots are no more likely to make their next shot (actually a bit
less likely). Really.

Once people are told these facts, they quickly start forming alternative
versions of the hot-hand theory. Maybe the defense adjusts and guards
the “hot” player more closely. Maybe the hot player adjusts and starts
taking harder shots. These are fine observations that need to be investi-
gated. But notice that, before seeing the data, when fans were asked about
actual shooting percentages after a series of made shots, they routinely
subscribed to the hot-hand theory—no qualifiers were thought neces-
sary. Many researchers have been so sure that the original Gilovich results
were wrong that they set out to find the hot hand. To date, no one has
found it.7

Jay Kochler and Caryn Conley (2003) performed a particularly clean
test using the annual three-point shooting contest held at the National
Basketball Association All-Star Game. In this contest, the players (among
the best three-point shooters in the league) take a series of shots from be-
hind the three-point shooting arc. Their goal is to make as many shots as
possible in sixty seconds. Without any defense or alternative shots, this
would seem to be an ideal situation in which to observe the hot hand.
However, as in the original study, there was no evidence of any streakiness.
This absence of streak shooting did not stop the announcers from detect-
ing sudden temperature variations in the players. (“Dana Baros is hot!”
“Legler is on fire!”) But these outbursts by the announcers had no predic-
tive power. Before the announcers spoke of hotness, the players had made
80.5 percent of their three previous shots. After the hotness pronounce-
ments, players made only 55.2 percent—not significantly better than their
overall shooting percentage in the contest, 53.9 percent.

Of course, it is no great problem if basketball fans are confused about
what they see when they are watching games on television. But the same
cognitive biases occur in other, more weighty domains. Consider the phe-
omenon of “cancer clusters.” These can cause a great deal of private and
public consternation, and they often attract sustained investigations, de-
signed to see what on earth (or elsewhere) could possibly have caused a
sudden and otherwise inexplicable outbreak of cancer cases. Suppose that
in a particular neighborhood we find an apparently elevated cancer rate—
maybe ten people, in a group of five hundred, have been diagnosed with
cancer within the same six-month period. Maybe all ten people live within
three blocks of one another. And in fact, American officials receive reports
of more than one thousand suspected cancer clusters every year, with many
of these suspected clusters investigated further for a possible “epidemic.”8

The problem is that in a population of three hundred million, it is in-
evitable that certain neighborhoods will see unusually high cancer rates
within any one-year period. The resulting “cancer clusters” may be prod-
ucts of random fluctuations. Nonetheless, people insist that they could not
possibly occur by chance. They get scared, and sometimes government
wrongly intervenes on their behalf. Mostly, though, there is thankfully
nothing to worry about, except for the fact that the use of the representa-
tiveness heuristic can cause people to confuse random fluctuations with
causal patterns.

Optimism and Overconfidence

Before the start of Thaler’s class in Managerial Decision Making,
students fill out an anonymous survey on the course Web site. One of the
questions is “In which decile do you expect to fall in the distribution of
grades in this class?” Students can check the top 10 percent, the second 10
percent, and so forth. Since these are MBA students, they are presumably
well aware that in any distribution, half the population will be in the top 50
percent and half in the bottom. And only 10 percent of the class can, in
fact, end up in the top decile.
Nevertheless, the results of this survey reveal a high degree of unrealistic optimism about performance in the class. Typically less than 5 percent of the class expects their performance to be below the median (the 50th percentile) and more than half the class expects to perform in one of the top two deciles. Invariably, the largest group of students put themselves in the second decile. We think this is most likely explained by modesty. They really think they will end up in the top decile, but are too modest to say so.

MBA students are not the only ones overconfident about their abilities. The “above average” effect is pervasive. Ninety percent of all drivers think they are above average behind the wheel, even if they don’t live in Lake Wobegon. And nearly everyone (including some who are rarely seen smiling) thinks he has an above-average sense of humor. (That is because they know what is funny!) This applies to professors, too. About 94 percent of professors at a large university were found to believe that they are better than the average professor, and there is every reason to think that such overconfidence applies to professors in general.9 (Yes, we admit to this particular failing.)

People are unrealistically optimistic even when the stakes are high. About 50 percent of marriages end in divorce, and this is a statistic most people have heard. But around the time of the ceremony, almost all couples believe that there is approximately a zero percent chance that their marriage will end in divorce—even those who have already been divorced!10 (Second marriage, Samuel Johnson once quipped, “is the triumph of hope over experience.”) A similar point applies to entrepreneurs starting new businesses, where the failure rate is at least 50 percent. In one survey of people starting new businesses (typically small businesses, such as contracting firms, restaurants, and salons), respondents were asked two questions: (a) What do you think is the chance of success for a typical business like yours? (b) What is your chance of success? The most common answers to these questions were 50 percent and 90 percent, respectively, and many said 100 percent to the second question.11

Unrealistic optimism can explain a lot of individual risk taking, especially in the domain of risks to life and health. Asked to envision their future, students typically say that they are far less likely than their classmates to be fired from a job, to have a heart attack or get cancer, to be divorced after a few years of marriage, or to have a drinking problem. Gay men systematically underestimate the chance that they will contract AIDS, even though they know about AIDS risks in general. Older people underestimate the likelihood that they will be in a car accident or suffer major diseases. Smokers are aware of the statistical risks, and often even exaggerate them, but most believe that they are less likely to be diagnosed with lung cancer and heart disease than most nonsmokers. Lotteries are successful partly because of unrealistic optimism.12

Unrealistic optimism is a pervasive feature of human life; it characterizes most people in most social categories. When they overestimate their personal immunity from harm, people may fail to take sensible preventive steps. If people are running risks because of unrealistic optimism, they might be able to benefit from a nudge. In fact, we have already mentioned one possibility: if people are reminded of a bad event, they may not continue to be so optimistic.

**Gains and Losses**

People hate losses (and their Automatic Systems can get pretty emotional about them). Roughly speaking, losing something makes you twice as miserable as gaining the same thing makes you happy. In more technical language, people are “loss averse.” How do we know this?

Consider a simple experiment.13 Half the students in a class are given coffee mugs with the insignia of their home university embossed on it. The students who do not get a mug are asked to examine their neighbor’s mugs. Then mug owners are invited to sell their mugs and nonowners are invited to buy them. They do so by answering the question “At each of the following prices, indicate whether you would be willing to (give up your mug/buy a mug).” The results show that those with mugs demand roughly twice as much to give up their mugs as others are willing to pay to get one. Thousands of mugs have been used in dozens of replications of this experiment, but the results are nearly always the same. Once I have a mug, I don’t want to give it up. But if I don’t have one, I don’t feel an urgent need to buy one. What this means is that people do not assign specific values to objects. When they have to give something up, they are hurt more than they are pleased if they acquire the very same thing.

It is also possible to measure loss aversion with gambles. Suppose I ask
you whether you want to make a bet. Heads you win $X, tails you lose $100. How much does X have to be for you to take the bet? For most people, the answer to this question is somewhere around $200. This implies that the prospect of winning $200 just offsets the prospect of losing $100.

Loss aversion helps produce inertia, meaning a strong desire to stick with your current holdings. If you are reluctant to give up what you have because you do not want to incur losses, then you will turn down trades you might have otherwise made. In another experiment, half the students in a class received coffee mugs (of course) and half got large chocolate bars. The mugs and the chocolate cost about the same, and in practice students were as likely to choose one as the other. Yet when offered the opportunity to switch from a mug to a candy bar or vice versa, only one in ten switched.

As we will see, loss aversion operates as a kind of cognitive nudge, pressing us not to make changes, even when changes are very much in our interests.

Status Quo Bias

Loss aversion is not the only reason for inertia. For lots of reasons, people have a more general tendency to stick with their current situation. This phenomenon, which William Samuelson and Richard Zeckhauser (1988) have dubbed the “status quo bias,” has been demonstrated in numerous situations. Most teachers know that students tend to sit in the same seats in class, even without a seating chart. But status quo bias can occur even when the stakes are much larger, and it can get us into a lot of trouble.

For example, in retirement savings plans, such as 401(k)s, most participants pick an asset allocation and then forget about it. In one study conducted in the late 1980s, participants in TIAA-CREF, the pension plan of many college professors, the median number of changes in the asset allocation of the lifetime of a professor was, believe it or not, zero. In other words, over the course of their careers, more than half of the participants made exactly no changes to the way their contributions were being allocated. Perhaps even more telling, many married participants who were single when they joined the plan still have their mothers listed as their beneficiaries!

Status quo bias is easily exploited. Many years ago American Express wrote Sunstein a cheerful letter telling him that he could receive, for free, three-month subscriptions to five magazines of his choice. Free subscriptions seem like a bargain, even if the magazines rarely get read, so Sunstein happily made his choices. What he didn’t realize was that unless he took some action to cancel his subscription, he would continue to receive the magazines, paying for them at the normal rate. For about a decade, he has continued to subscribe to magazines that he hardly ever reads. (He keeps intending to cancel those subscriptions, but somehow never gets around to it. We hope to get around to discussing procrastination in the next chapter.)

One of the causes of status quo bias is a lack of attention. Many people adopt what we will call the “yeah, whatever” heuristic. A good illustration is the carryover effect in television viewing. Network executives spend a lot of time working on scheduling because they know that a viewer who starts the evening on NBC tends to stay there. Since remote controls have been pervasive in this country for decades, the actual “switching” costs in this context are literally one thumb press. But when one show ends and the next one comes on, a surprisingly high number of viewers (implicitly) say, “yeah, whatever” and keep watching. Nor is Sunstein the only victim of automatic renewal of magazine subscriptions. Those who are in charge of circulation know that when renewal is automatic, and when people have to make a phone call to cancel, the likelihood of renewal is much higher than it is when people have to indicate that they actually want to continue to receive the magazine.

The combination of loss aversion with mindless choosing implies that if an option is designated as the “default,” it will attract a large market share. Default options thus act as powerful nudges. In many contexts defaults have some extra nudging power because consumers may feel, rightly or wrongly, that default options come with an implicit endorsement from the default setter, be it the employer, government, or TV scheduler. For this and other reasons, setting the best possible defaults will be a theme we explore often in the course of this book.
Framing

Suppose that you are suffering from serious heart disease and that your doctor proposes a grueling operation. You’re understandably curious about the odds. The doctor says, “Of one hundred patients who have this operation, ninety are alive after five years.” What will you do? If we fill in the facts in a certain way, the doctor’s statement will be pretty comforting, and you’ll probably have the operation.

But suppose the doctor frames his answer in a somewhat different way. Suppose that he says, “Of one hundred patients who have this operation, ten are dead after five years.” If you’re like most people, the doctor’s statement will sound pretty alarming, and you might not have the operation. The Automatic System thinks: “A significant number of people are dead, and I might be one of them!” In numerous experiments, people react very differently to the information that “ninety of one hundred are alive” than to the information that “ten of one hundred are dead”—even though the content of the two statements is exactly the same. Even experts are subject to framing effects. When doctors are told that “ninety of one hundred are alive,” they are more likely to recommend the operation than if told that “ten of one hundred are dead.”

Framing matters in many domains. When credit cards started to become popular forms of payment in the 1970s, some retail merchants wanted to charge different prices to their cash and credit card customers. (Credit card companies typically charge retailers 1 percent of each sale.) To prevent this, credit card companies adopted rules that forbade their retailers from charging different prices to cash and credit card customers. However, when a bill was introduced in Congress to outlaw such rules, the credit card lobby turned its attention to language. Its preference was that if a company charged different prices to cash and credit card customers, the credit price should be considered the “normal” (default) price and the cash price a discount—rather than the alternative of making the cash price the usual price and charging a surcharge to credit card customers.

The credit card companies had a good intuitive understanding of what psychologists would come to call “framing.” The idea is that choices depend, in part, on the way in which problems are stated. The point matters a great deal for public policy. Energy conservation is now receiving a lot of attention, so consider the following information campaigns: (a) If you use energy conservation methods, you will save $350 per year; (b) If you do not use energy conservation methods, you will lose $350 per year. It turns out that information campaign (b), framed in terms of losses, is far more effective than information campaign (a). If the government wants to encourage energy conservation, option (b) is a stronger nudge.

Framing works because people tend to be somewhat mindless, passive decision makers. Their Reflective System does not do the work that would be required to check and see whether reframing the questions would produce a different answer. One reason they don’t do this is that they wouldn’t know what to make of the contradiction. This implies that frames are powerful nudges, and must be selected with caution.

So What?

Our goal in this chapter has been to offer a brief glimpse at human fallibility. The picture that emerges is one of busy people trying to cope in a complex world in which they cannot afford to think deeply about every choice they have to make. People adopt sensible rules of thumb that sometimes lead them astray. Because they are busy and have limited attention, they accept questions as posed rather than trying to determine whether their answers would vary under alternative formulations. The bottom line, from our point of view, is that people are, shall we say, nudge-able. Their choices, even in life’s most important decisions, are influenced in ways that would not be anticipated in a standard economic framework. Here is one final example to illustrate.

One of the most scenic urban thoroughfares in the world is Chicago’s Lake Shore Drive, which hugs the Lake Michigan coastline that is the city’s eastern boundary. The drive offers stunning views of Chicago’s magnificent skyline. There is one stretch of this road that puts drivers through a series of S curves. These curves are dangerous. Many drivers fail to take heed of the reduced speed limit (25 mph) and wipe out. Recently, the city has employed a new way of encouraging drivers to slow down.

At the beginning of the dangerous curve, drivers encounter a sign painted on the road warning of the lower speed limit, and then a series of white stripes painted onto the road. The stripes do not provide much if any
tactile information (they are not speed bumps) but rather just send a visual signal to drivers. When the stripes first appear, they are evenly spaced, but as drivers reach the most dangerous portion of the curve, the stripes get closer together, giving the sensation that driving speed is increasing (see Figure 1.5). One’s natural instinct is to slow down. When we drive on this familiar stretch of road, we find that those lines are speaking to us, gently urging us to touch the brake before the apex of the curve. We have been nudged.
Temptation

Many years ago, Thaler was hosting dinner for some guests (other then-young economists) and put out a large bowl of cashew nuts to nibble on with the first bottle of wine. Within a few minutes it became clear that the bowl of nuts was going to be consumed in its entirety, and that the guests might lack sufficient appetite to enjoy all the food that was to follow. Leaping into action, Thaler grabbed the bowl of nuts, and (while sneaking a few more nuts for himself) removed the bowl to the kitchen, where it was put out of sight.

When he returned, the guests thanked him for removing the nuts. The conversation immediately turned to the theoretical question of how they could possibly be happy about the fact that there was no longer a bowl of nuts in front of them. (You can now see the wisdom of the rule of thumb mentioned in Chapter 1 about a cap on the proportion of economists among attendees at a dinner party.) In economics (and in ordinary life), a basic principle is that you can never be made worse off by having more options, because you can always turn them down. Before Thaler removed the nuts the group had the choice of whether to eat the nuts or not—now they didn’t. In the land of Econs, it is against the law to be happy about this!

To help us understand this example, consider how the preferences of the group seemed to evolve over time. At 7:15, just before Thaler removed the nuts, the dinner guests had three options: eat a few nuts; eat all the nuts; and eat no more nuts. Their first choice would be to eat just a few more nuts, followed by eating no more nuts. The worst option was finishing the bowl, since that would ruin dinner. But by 7:30, had the nuts remained on the table, the group would have finished the bowl, thereby reaching their least favorite option. Why would the group change its mind in the space of just fifteen minutes? Or do we really want to say that the group has changed its mind?

In the language of economics, the group is said to display behavior that is dynamically inconsistent. Initially people prefer A to B, but they later choose B over A. We can see dynamic inconsistency in many places. On Saturday morning people might say that they prefer exercising to watching television, but once the afternoon comes, they are on the couch at home watching the football game. How can such behavior be understood?

Two factors must be introduced in order to understand the cashew phenomenon: temptation and mindlessness. Human beings have been aware of the concept of temptation at least since the time of Adam and Eve, but for purposes of understanding the value of nudges, that concept needs elaboration. What does it mean for something to be "tempting"?

As with Supreme Court Justice Potter Stewart's “I know it when I see it” adage about pornography, temptation is easier to recognize than to define. Our preferred definition requires recognizing that people's state of arousal varies over time. To simplify things we will consider just the two end points: hot and cold. When Sally is very hungry and appetizing aromas are emanating from the kitchen, we can say she is in a hot state. When Sally is thinking abstractly on Tuesday about the right number of cashews she should consume before dinner on Saturday, she is in a cold state. We will call something “tempting” if we consume more of it when hot than when cold. None of this means that decisions made in a cold state are always better. For example, sometimes we have to be in a hot state to overcome our fears about trying new things. Sometimes dessert really is delicious, and we do best to go for it. Sometimes it is best to fall in love. But it is clear that when we are in a hot state, we can often get into a lot of trouble.

Most people realize that temptation exists, and they take steps to overcome it. The classic example is that of Ulysses, who faced the peril of the Sirens and their irresistible songs. While in a cold state, Ulysses instructed his crew to fill their ears with wax so that they would not be tempted by the music. He also asked the crew to tie him to the mast so that he could listen
for himself but be restrained from submitting to the temptation to steer the ship closer when the music put him into a hot state.

Ulysses successfully solved his problem. For most of us, however, self-control issues arise because we underestimate the effect of arousal. This is something the behavioral economist George Loewenstein (1996) calls the "hot-cold empathy gap." When in a cold state, we do not appreciate how much our desires and our behavior will be altered when we are "under the influence" of arousal. As a result, our behavior reflects a certain naiveté about the effects that context can have on choice. Tom is on a diet and agrees to go out on a business dinner, thinking that he will be able to limit himself to one glass of wine and no dessert. But the host orders a second bottle of wine and the waiter brings by the dessert cart, and all bets are off. Marilyn thinks that she can go into a department store when they are having a big sale and just see whether they have something on sale that she really needs. She ends up with shoes that hurt (but were 70 percent off). Robert thinks he will engage only in safe sex, but then must make all the crucial decisions while aroused. Similar problems affect those who have problems with smoking, alcohol, a failure to exercise, excessive borrowing, and insufficient savings.

Self-control problems can be illuminated by thinking about an individual as containing two semiautonomous selves, a far-sighted "Planner" and a myopic "Doer." You can think of the Planner as speaking for your Reflective System, or the Mr. Spock lurking within you, and the Doer as heavily influenced by the Automatic System, or everyone's Homer Simpson. The Planner is trying to promote your long-term welfare but must cope with the feelings, mischief, and strong will of the Doer, who is exposed to the temptations that come with arousal. Recent research in neuroeconomics (yes, there really is such a field) has found evidence consistent with this two-system conception of self-control. Some parts of the brain get tempted, and other parts are prepared to enable us to resist temptation by assessing how we should react to the temptation. Sometimes the two parts of the brain can be in severe conflict—a kind of battle that one or the other is bound to lose.

Mindless Choosing

The cashew problem is not only one of temptation. It also involves the type of mindless behavior we discussed in the context of inertia. In many situations, people put themselves into an "automatic pilot" mode, in which they are not actively paying attention to the task at hand. (The Automatic System is very comfortable that way.) On a Saturday morning when we set out to run an errand, we can easily find ourselves driving our usual route to work—until we realize we are headed in the opposite direction from our intended destination, the grocery store. On a Sunday morning, we follow our ordinary routine with coffee and the newspaper—until we realize that we had arranged to meet a friend for brunch an hour earlier. Eating turns out to be one of the most mindless activities we do. Many of us simply eat whatever is put in front of us. That is why even massive bowls of cashews are likely to be consumed completely, regardless of the quality of the food that is soon to be arriving.

The same is true of popcorn—even stale popcorn. A few years ago, Brian Wansink and his colleagues ran an experiment in a Chicago movie theater in which moviegoers found themselves with a free bucket of stale popcorn. It had been popped five days earlier and stored so as to ensure that it would actually squeak when eaten. People were not specifically informed of its staleness, but they didn't like the popcorn. As one moviegoer said, "It was like eating Styrofoam packing peanuts." In the experiment, half of the moviegoers received a big bucket of popcorn and half received a medium-sized bucket. On average, recipients of the big bucket ate about 53 percent more popcorn—even though they didn't really like it. After the movie, Wansink asked the recipients of the big bucket whether they might have eaten more because of the size of their bucket. Most denied the possibility, saying, "Things like that don't trick me." But they were wrong.

The same is true of soup. In another Wansink (2006) masterpiece, people sat down to a large bowl of Campbell's tomato soup and were told to eat as much as they wanted. Unbeknownst to them, the soup bowls were designed to refill themselves (with empty bottoms connected to machinery beneath the table). No matter how much soup subjects ate, the bowl never emptied. Many people just kept eating, not paying attention to the fact that they were really eating a great deal of soup, until the experiment
was (mercifully) ended. Large plates and large packages mean more eating; they are a form of choice architecture, and they work as major nudges. (Hint: if you would like to lose weight, get smaller plates, buy little packages of what you like, and don’t keep tempting food in the refrigerator.)

When self-control problems and mindless choosing are combined, the result is a series of bad outcomes for real people. Millions of Americans still smoke in spite of the evidence that smoking has terrible health consequences, and, significantly, the overwhelming majority of smokers say that they would like to quit. Nearly two-thirds of Americans are overweight or obese. Many people never get around to joining their company’s retirement savings plan, even when it is heavily subsidized. Together, these facts suggest that significant numbers of people could benefit from a nudge.

Self-Control Strategies

Since people are at least partly aware of their weaknesses, they take steps to engage outside help. We make lists to help us remember what to buy at the grocery store. We buy an alarm clock to help us get up in the morning. We ask friends to stop us from having dessert or to fortify our efforts to quit smoking. In these cases, our Planners are taking steps to control the actions of our Doers, often by trying to change the incentives that Doers face.

Unfortunately, Doers are often difficult to rein in (think of controlling Homer), and they can foil the best efforts of Planners. Consider the mundane but revealing example of the alarm clock. The optimistic Planner sets the alarm for 6:15 A.M., hoping for a full day of work, but the sleepy Doer turns off the alarm and goes back to sleep until 9:00. This can lead to fierce battles between the Planner and the Doer. Some Planners put the alarm clock on the other side of the room, so the Doer at least has to get up to turn it off, but if the Doer crawls back into bed, all is lost. Fortunately, enterprising firms sometimes offer to help the Planner out.

Consider the alarm clock “Clocky,” pictured in Figure 2.1. Clocky is the “alarm clock that runs away and hides if you don’t get out of bed.” With Clocky, the Planner sets the number of snooze minutes the Doer will be permitted in the morning. When that number runs out, the clock jumps off the night stand and moves around the room making annoying sounds. The only way to turn the damn thing off is to get out of bed and find it. By that time, even a groggy Doer is awake.

Planners have a number of available strategies, such as Clocky, to control recalcitrant Doers, but they can sometimes use some help from outsiders. We will be exploring how private and public institutions can provide that help. In daily life, one strategy involves informal bets. Thaler once helped a young colleague by using this strategy. The colleague (let’s call him David) had been hired as a new faculty member with the expectation that he would complete the requirements for his Ph.D. before he arrived, or at worst within his first year as a faculty member. David had lots of incentives...
to finish his thesis, including a strong financial incentive: until he graduated the university treated him as an “instructor” rather than an assistant professor and did not make its normal contributions to his retirement plan, which amounted to 10 percent of his salary (thousands of dollars a year). David’s inner Planner knew that he needed to stop procrastinating and get his thesis done, but his Doer was involved in many other more exciting projects and always put off the drudgery of writing up the thesis.

(Thinking about new ideas is usually more fun than writing up old ones.) That is when Thaler intervened by offering David the following deal. David would write Thaler a series of checks for $100, payable on the first day of each of the next few months. Thaler would cash each check if David did not put a copy of a new chapter of the thesis under his door by midnight of the corresponding month. Furthermore, Thaler promised to use the money to have a party to which David would not be invited. David completed his thesis on schedule four months later, never having missed a deadline (though most chapters were completed within mere minutes of being due). It is instructive that this incentive scheme worked even though David’s monetary incentive from the university was greater than $100 a month, just from the retirement contribution alone.

The scheme worked because the pain of having Thaler cash the check and consume some good wine without him was more salient than the rather abstract and pallid forgone contribution to his retirement savings plan. Many of Thaler’s friends have threatened to go into business competing with him on this incentive plan, though Thaler points out that in order to go into this business, you have to be known as a big enough jerk actually to cash the check.

Sometimes friends can adopt such betting strategies together. John Romalis and Dean Karlan, two economists, adopted an ingenious arrangement for weight loss. When John and Dean were in graduate school in economics, they noticed that they were putting on weight, especially during the period when they were on the job market and being wined and dined by potential employers. They made a pact. Each agreed to lose thirty pounds over a period of nine months. If either failed, he had to pay the other $10,000. The bet was a big success; both met their target. They then turned to the more difficult problem of keeping the weight off. The rules they adopted were that on one day’s notice, either one could call for a weigh-in. If either was found to be over the target weight, he would have to pay the other an agreed sum. In four years, there were several weigh-ins, and only once was either one over target (the resulting fine was paid in full immediately). Notice that as in the case of David’s thesis bet, Dean and John were acknowledging that without the bet to encourage them, they would have eaten too much, even though they still would have wanted to lose the weight.

More formal versions of these strategies are easy to imagine. In Chapter 16 we will encounter the website Stickk.com (of which Karlan is a co-founder), which gives people a method by which their Planners can constrain their Doers. In some situations, people may even want the government to help them deal with their self-control problems. In extreme cases, governments might ban some items (such as heroin use, prostitution, and drunken driving). Such bans can be seen as pure rather than libertarian paternalism, though third-party interests are also at stake. In other cases, individuals may prefer a less intrusive role for the government. For example, smokers might benefit from cigarette taxes, which discourage consumption without forbidding it. Also, some states have attempted to help gamblers by creating a mechanism by which they can put themselves on a list of people who are banned from casinos (again see Chapter 16 for details). Since no one is required to sign up, and since a refusal to do so is close to costless, this approach really can be counted as libertarian as we understand the term.

One interesting example of a government-imposed self-control strategy is daylight saving time (or summer time, as it is called in many parts of the world). Surveys reveal that most people think that daylight saving time is a great idea, primarily because they enjoy the “extra” hour of daylight during the evening. Of course, the number of daylight hours on a given day is fixed, and setting the clocks ahead one hour does nothing to increase the amount of daylight. The simple change of the labels on the hours of the day, calling “six o’clock” by the name “seven o’clock,” nudges us all into waking up an hour earlier. Along with having more time to enjoy an evening softball game, we end up saving energy too. Historical note: the idea was first suggested by Benjamin Franklin during his tenure as an American delegate in Paris. A well-known skinflint, Franklin calculated that thousands of pounds of candle wax could be saved with his idea. However, the idea did not catch on until World War I.
In many cases, markets provide self-control services, and government is not needed at all. Companies can make a lot of money by strengthening Planners in their battle with Doers, often doing well by doing good. An interesting example is a distinctive financial services institution that used to be quite popular: the Christmas savings club. Here is how a Christmas club typically works. In November (around Thanksgiving) a customer opens an account at her local bank and commits herself to depositing a given amount (say $10) each week for the next year. Funds cannot be withdrawn until a year later, when the total amount is redeemed, just in time for the Christmas shopping season. The usual interest rate on these accounts is close to zero.

Think about the Christmas club in economic terms. This is an account with no liquidity (you can’t take your money out for a year), high transaction costs (you have to make deposits every week), and a near-zero rate of return. It is an easy homework exercise in an economics class to prove that such an institution cannot exist. Yet for many years Christmas clubs were widely used, with billions of dollars in investments. If we realize that we are dealing with Humans rather than Econs, it is not hard to explain why the clubs flourished. Households lacking enough money for Christmas giving would resolve to solve the problem next year by joining a Christmas club. The inconvenience of making the deposits and the loss of money paid in interest would be small prices to pay in return for the assurance of having enough money to buy gifts. And think back to Ulysses, tying himself to the mast—the fact that money could not be withdrawn was a plus, not a minus. The absence of liquidity was precisely the point. Christmas clubs are in many ways an adult version of a child’s piggy bank, designed to make it easier to put money in than to take money out. The fact that it is hard to withdraw money is entirely the point of the device.

While Christmas clubs still exist, they have been made unnecessary for most households by the advent of credit cards. Since Christmas shopping can now be financed, households no longer find it necessary to save up in advance. This is not to say, of course, that the new regime is in all respects better. Saving at a zero percent interest rate with no opportunity to withdraw the funds may seem dumb, and it is clearly worse than just depositing the money into an interest-bearing account, but earning a zero interest rate may well be preferable to paying 18 percent or more on credit card debt.

The market battle between credit cards and Christmas clubs is a good illustration of a more general point, one to which we will return. Markets provide strong incentives for firms to cater to the demands of consumers, and firms will compete to meet those demands, whether or not those demands represent the wisest choices. One firm might devise a clever self-control device such as a Christmas club, but that firm cannot prevent another firm from offering to lend people money in anticipation of the receipts of those funds. Credit cards and Christmas clubs compete, and indeed both are offered by the same institutions—banks. While competition does drive down prices, it does not always lead to an outcome that is best for consumers.

Even when we’re on our way to making good choices, competitive markets find ways to get us to overcome our last shred of resistance to bad ones. At O’Hare Airport in Chicago, two food vendors compete across the aisle from each other. One sells fruit, yogurt, and other healthy foods. The other sells Cinnabons, sinful cinnamon buns that have a whopping 730 calories and 24 grams of fat. Your Planner may have set the course for the yogurt and fruit stand, but the Cinnabon outlet blasts the aromas from their ovens directly into the walkway in front of the store. Care to guess which of the two stores always has the longer line?

**Mental Accounting**

Alarm clocks and Christmas clubs are external devices people use to solve their self-control problems. Another way to approach these problems is to adopt internal control systems, otherwise known as mental ac-

*Although Christmas clubs have become unpopular, most Americans still make use of a non-interest bearing savings vehicle that might be called the Easter account. Three-quarters of Americans get refunds when they file their tax return, with the average refund being more than two thousand dollars. If these refunds were described as interest-free loans to the government, they would probably not be so popular. Al-
Mental accounting is the system (sometimes implicit) that households use to evaluate, regulate, and process their home budget. Almost all of us use mental accounts, even if we’re not aware that we’re doing so.

The concept is beautifully illustrated by an exchange between the actors Gene Hackman and Dustin Hoffman in one of those extra features offered on DVDs. Hackman and Hoffman were friends back in their starving artist days, and Hackman tells the story of visiting Hoffman’s apartment and having his host ask him for a loan. Hackman agreed to the loan, but then they went into Hoffman’s kitchen, where several mason jars were lined up on the counter, each containing money. One jar was labeled “rent,” another “utilities,” and so forth. Hackman asked why, if Hoffman had so much money in jars, he could possibly need a loan, whereupon Hoffman pointed to the food jar, which was empty.

According to economic theory (and simple logic), money is “fungible,” meaning that it doesn’t come with labels. Twenty dollars in the rent jar can buy just as much food as the same amount in the food jar. But households adopt mental accounting schemes that violate fungibility for the same reasons that organizations do: to control spending. Most organizations have budgets for various activities, and anyone who has ever worked in such an organization has experienced the frustration of not being able to make an important purchase because the relevant account is already depleted. The fact that there is unspent money in another account is considered no more relevant than the money sitting in the rent jar on Dustin Hoffman’s kitchen counter.

At the household level, violations of fungibility are everywhere. One of the most creative examples of mental accounting was invented by a finance professor we know. At the beginning of each year, he designates a certain amount of money (say $2,000) as his intended gift to the United Way charity. Then if anything bad happens to him during the year—a parking ticket, for example—he mentally deducts the fine against the United Way gift. This provides him “insurance” against minor financial mishaps.*

You can also see mental accounting in action at the casino. Watch a gambler who is lucky enough to win some money early in the evening. You might see him take the money he has won and put it into one pocket and put the money he brought with him to gamble that evening (yet another mental account) into a different pocket. Gamblers even have a term for this. The money that has recently been won is called “house money” because in gambling parlance the casino is referred to as the house. Betting some of the money that you have just won is referred to as “gambling with the house’s money,” as if it were, somehow, different from some other kind of money. Experimental evidence reveals that people are more willing to gamble with money that they consider house money.

This same mentality affects people who never gamble. When investments pay off, people are willing to take big chances with their “winnings.” For example, mental accounting contributed to the large increase in stock prices in the 1990s, as many people took on more and more risk with the justification that they were playing only with their gains from the past few years. Similarly, people are far more likely to splurge impulsively on a big luxury purchase when they receive an unexpected windfall than with savings that they have accumulated over time, even if those savings are fully available to be spent.

Mental accounting matters precisely because the accounts are treated as nonfungible. True, the mason jars used by Dustin Hoffman (and his parents’ generation) have largely disappeared. But many households continue to designate accounts for various uses: children’s education, vacations, retirement, and so forth. In many cases these are literally different accounts, as opposed to entries in a ledger. The sanctity of these accounts can lead to seemingly bizarre behavior, such as simultaneously borrowing and lending at very different rates. David Gross and Nick Souleles (2002) found that the typical household in their sample had more than $5,000 in liquid assets (typically in savings accounts earning less than 5 percent a year) and nearly $3,000 in credit card balances, carrying a typical interest rate of 18 percent or more. Using the money from the savings account to pay off the credit card debt amounts to what economists call an arbitrage opportunity—buying low and selling high—but the vast majority of households fail to take advantage.

Just as with Christmas clubs, though, this behavior might not be as stupid as it looks. Many of these households have borrowed up to the limits that their credit cards set. They may realize that if they paid off the credit account with

*You might think that this deprives the United Way of money, but not so. The professor has to make sure his intended gift is large enough to cover all his mishaps.
card debt from the savings account, they would soon run up the cards to their limits once again. (And credit card companies, fully aware of this, are often more than willing to extend more credit to those who have reached the limit, as long as they aren’t yet falling behind on interest payments.) Keeping the money in the separate accounts is thus another costly self-control strategy, just like the Christmas club.

Of course, many people do not suffer from an inability to save. Some people actually have trouble spending. If their problem is extreme, we call such people misers, but even regular folks can find that they don’t give themselves enough treats. We have a friend named Dennis who has adopted a clever mental accounting strategy to deal with this problem. When Dennis turned sixty-five, he started collecting Social Security payments, although both he and his wife continue to work full-time. Since he has been a good saver over the years (in part because his employer has a mandatory and generous retirement plan), Dennis wanted to be sure he would do the things he enjoys (especially trips to Paris with lots of eating) now while he is still healthy, and not be put off by the expense. So he opened a special savings account for his Social Security checks and has designated the money in this account as a “fun account.” A fancy new bike or a case of good wine would be acceptable purchases from this account, but a repair to the roof would certainly not.

For each of us, using mental accounts can be extremely valuable. They make life both more fun and more secure. Many of us could benefit from a near-sacrosanct “rainy day” account and from a freely available “entertainment and fun” account. Understanding mental accounts would also improve public policy. As we will see, if we want to encourage savings, it will be important to direct the increased savings into a mental (or real) account where spending it will not be too big a temptation.

The Reverend Jim Jones was the founder and leader of the People’s Temple. In 1978 Jones, facing charges of tax evasion, moved most of his one thousand followers from San Francisco to a small settlement in Guyana, which he named Jonestown. Facing a federal investigation for reported acts of child abuse and torture, Jones decided that his followers should poison their children and then themselves. They prepared vats of poison. A few people resisted; a few others shouted out their protest, but they were silenced. Following Jones’s orders, and the social pressures imposed by one another, mothers and fathers duly poisoned their children. Then they poisoned themselves. Their bodies were found arm in arm, lying together.1

Econs (and some economists we know) are pretty unsociable creatures. They communicate with others if they can gain something from the encounter, they care about their reputations, and they will learn from others if actual information can be obtained, but Econs are not followers of fashion. Their hemlines would not go up and down except for practical reasons, and ties, if they existed at all in a world of Econs, would not grow narrower and wider simply as a matter of style. (By the way, ties were originally used as napkins; they actually had a function.) Humans, on the other hand, are frequently nudged by other Humans. Sometimes massive social changes, in markets and politics alike, start with a small social nudge.

Humans are not exactly lemmings, but they are easily influenced by the statements and deeds of others. (Again by the way, lemmings do not really
Fraught Choices

Suppose you are told that a group of people will have to make some choice in the near future. You are the choice architect. You are trying to decide how to design the choice environment, what kinds of nudges to offer, and how subtle the nudges should be. What do you need to know to design the best possible choice environment?

Benefits Now—Costs Later

We have seen that predictable problems arise when people must make decisions that test their capacity for self-control. Many choices in life, such as whether to wear a blue shirt or a white one, lack important self-control elements. Self-control issues are most likely to arise when choices and their consequences are separated in time. At one extreme are what might be called investment goods, such as exercise, flossing, and dieting. For these goods the costs are borne immediately, but the benefits are delayed. For investment goods, most people err on the side of doing too little. Although there are some exercise nuts and flossing freaks, it seems safe to say that not many people are resolving on New Year’s Eve to floss less next year and to stop using the exercise bike so much.

At the other extreme are what might be called sinful goods: smoking, alcohol, and jumbo chocolate doughnuts are in this category. We get the pleasure now and suffer the consequences later. Again we can use the New Year’s resolution test: how many people vow to smoke more cigarettes, drink more martinis, or have more chocolate donuts in the morning next year? Both investment goods and sinful goods are prime candidates for nudges. Most (nonanorexic) people do not need any special encouragement to eat another brownie, but they could use some help exercising more.

Degree of Difficulty

Nearly everyone over the age of six can tie shoelaces, play a respectable game of tic-tac-toe, and spell the word cat. But only a few of us can tie a decent bow tie, play a masterly game of chess, or spell (much less pronounce) the name of the psychologist Mihály Csíkszentmihályi. Of course, we learn to cope with the harder problems. We can buy a pretied
bow tie, read a book about chess, and look up the spelling of Csikszentmihályi on the Web (then copy and paste every time we have to use the name). We use spell checkers and spreadsheets to help with harder problems. But many problems in life are quite difficult, and often there is no technology as easy as a spell checker available to help. We are more likely to need more help picking the right mortgage than choosing the right loaf of bread.

Frequency

Even hard problems become easier with practice. Both of us have managed to learn how to serve a tennis ball into the service court with reasonable regularity (and in Sunstein’s case, even velocity), but it took some time. The first time people try to execute this motion, they are lucky if the ball goes over the net, much less into the service box. Practice makes perfect (or at least better).

Unfortunately, some of life’s most important decisions do not come with many opportunities to practice. Most students choose a college only once. Outside of Hollywood, most of us choose a spouse, well, not more than two or three times. Few of us get to try many different careers. And outside of science fiction, we get one chance to save for retirement (though we can make some adjustments along the way). Generally, the higher the stakes, the less often we are able to practice. Most of us buy houses and cars not more than once or twice a decade, but we are really practiced at grocery shopping. Most families have mastered the art of milk inventory control, not by solving the relevant mathematical equation but through trial and error.*

*There is a deep irony here. Many economists have dismissed psychology experiments on the grounds that the experiments are only for “low stakes” and that people are often not given sufficient opportunities to learn. These economists argue that if the stakes were raised, and subjects were given practice trials, then people would “get it right.” There are at least two problems with this argument. First, there is little evidence that performance improves when the stakes go up. To a first approximation, the stakes just don’t seem to matter much (see Camerer and Hogarth, 1999). Second, and more important, economics is supposed to help explain life’s big decisions, and these are the decisions that come without many practice trials. There might be a lower divorce rate if people had several “practice marriages” in their twenties and thirties before settling down to the real thing (though we are not confident about that prediction), but the

None of this is to say that the government should be telling people whom to marry or what to study. This is a book about libertarian paternalism. At this stage we just want to stress that rare, difficult choices are good candidates for nudges.

Feedback

Even practice does not make perfect if people lack good opportunities for learning. Learning is most likely if people get immediate, clear feedback after each try. Suppose you are practicing your putting skills on the practice green. If you hit ten balls toward the same hole, it is easy to get a sense of how hard you have to hit the ball. Even the least talented golfers will soon learn to gauge distance under these circumstances. Suppose instead you were putting the golf balls but not getting to see where they were going. In that environment, you could putt all day and never get any better.

Alas, many of life’s choices are like practicing putting without being able to see where the balls end up, and for one simple reason: the situation is not structured to provide good feedback. For example, we usually get feedback only on the options we select, not the ones we reject. Unless people go out of their way to experiment, they may never learn about alternatives to the familiar ones. If you take the long route home every night, you may never learn there is a shorter one. Long-term processes rarely provide good feedback. Someone can eat a high-fat diet for years without having any warning signs until the heart attack. When feedback does not work, we may benefit from a nudge.

Knowing What You Like

Most of us have a good sense of whether we prefer coffee ice cream to vanilla, Frank Sinatra to Bob Dylan, and mysteries to science fiction. These are examples for which we have had the time to sample the alternatives and learn about our tastes. But suppose that you have to forecast your preferences for the unfamiliar, such as when dining for the first

*fact is that in real life choosing a life partner is hard and people often fail. Similarly, there might be fewer philosophy Ph.D.’s driving cabs if choices about graduate school came with practice trials, but at age thirty-five it is hard to ask for a “do-over.”
time in a country with an exotic cuisine. Smart tourists often rely on others (waiters, for example) for help: “Most foreigners like x and hate y.” Even in less exotic locales, it can be smart to let someone else choose for you. Two of the best restaurants in Chicago (Alinea and Charlie Trotter’s) give their diners the fewest choices. At Alinea diners just decide whether they want fifteen very small plates or twenty-five tiny ones. At Charlie Trotter’s, the diner is asked only whether to limit the dining to vegetables or not. (In both, one is asked about dietary restrictions and allergies.) The benefit of having so little choice is that the chef is authorized to cook you things you would never have thought to order.

It is particularly hard for people to make good decisions when they have trouble translating the choices they face into the experiences they will have. A simple example is ordering a dish from a menu in a language you do not understand. But even when you do know the meaning of the words being used, you may not be able to translate the alternatives you are considering into terms that make the slightest sense to you.

Take the problem of choosing a mutual fund for your retirement portfolio. Most investors (including us) would have trouble knowing how to compare a “capital appreciation” fund with a “dynamic dividend” fund, and even if the use of those words were made comprehensible, the problem would not be solved. What an investor needs to know is how a choice between those funds affects her spending power during retirement under various scenarios—something even an expert armed with a good software package and complete knowledge of the portfolios held by each fund can have trouble analyzing. The same problem arises for the choice among health plans; we may have little understanding of the effects of our selection. If your daughter gets a rare disease, will she be able to see a good specialist? How long will she have to wait in line? When people have a hard time predicting how their choices will end up affecting their lives, they have less to gain by numerous options and perhaps even by choosing for themselves. A nudge might be welcomed.

Markets: A Mixed Verdict

The discussion thus far suggests that people may most need a good nudge for choices that have delayed effects; those that are difficult, infrequent, and offer poor feedback; and those for which the relation between choice and experience is ambiguous. A natural question is whether free markets can solve people’s problems, even under such circumstances. Often market competition will do a lot of good. But in some cases, companies have a strong incentive to cater to people’s frailties and to exploit them.

Notice first that many insurance products have all of the fraught features that we have sketched. The benefits from holding the insurance are delayed, the probability of having a claim is hard to analyze, consumers do not get useful feedback on whether they are getting a good return on their insurance purchases, and the mapping from what they are buying to what they are getting can be ambiguous. But the insurance market is competitive, so a natural question to ask is whether market forces can be relied upon to “solve” the problem of fraught choices.

Let’s imagine two different worlds. In one world, Econworld, all the consumers are Econos and they have no problem with difficult choices. All quantitative decisions, including insurance purchases, are a piece of cake for them. (Econos are part actuary.) The other world is called Humanworld, and in this world some of the consumers are Humans, who have all the features that generally characterize the tribe, while the rest are Econos. In both worlds, there are well-functioning markets and at least some perfectly rational firms that have hired Econos as managers. The key question is whether the insurance purchases in Humanworld will be the same as the ones in Econworld. In other words, do well-functioning markets render the humanness of the Humans irrelevant?

To analyze this question, let’s start with a simple example inspired by a wonderful poem by Shel Silverstein (1974) entitled “Smart.” The poem is fun as well as brilliant, so if you have a computer nearby, we suggest that you type “Smart” and “Shel Silverstein” into Google and read the poem now. We will wait for you to get back before continuing.

*Silverstein had personally given Thaler permission to use the poem in an academic paper published in 1985—he said he was tickled to see his work appear in the American Economic Review—but the poem is now controlled by his estate, which, after several nudges (otherwise known as desperate pleas), has denied us permission to reprint the poem here. Since we would have been happy to pay royalties, unlike the Web sites you will find via Google, we can only guess that the managers of the estate (to paraphrase the poem) don’t know that some is more than none.
For those of you reading this on a plane (or too lazy to get up out of bed), the poem’s tale is simple. The child narrator explains that his father gave him a dollar bill, which he wisely traded for two quarters because he (unlike his dumb trading partners) knows that two is more than one. He continues trading—the two quarters for three dimes; three dimes for four nickels; and finally four nickels for five pennies. Finally the son comes back to his father to report on his series of brilliant trades. When he does so, he reports that his father was “too proud of [him] to speak.”

Suppose that some Humans in a well-functioning market economy prefer two quarters to one dollar because two is more than one. What happens to these quarter lovers? Are they harmed? And do they influence market prices? The answers to these questions depend a bit on how dumb the quarter lovers are, but let’s suppose that while they prefer two quarters to one dollar, they still prefer more quarters to fewer quarters (since they love quarters). That means that while they would, in principle, be willing to trade two quarters for a dollar, they won’t have to do that, because banks (among others) will compete for their business, and will be happy to give them four quarters for each dollar. Of course the quarter lovers will think they are getting a great deal on this trade, but as long as there is competition in the provision of quarters, quarters will still sell for twenty-five cents and the irrational love of quarters will be essentially harmless to those who have this affliction.

The example is obviously an extreme one, but many markets are not so different from this situation. Most of the time, competition ensures that price serves as a good signal of quality. Usually (but not always) the fifty-dollar bottles of wine are better than the twenty-dollar bottles. And irrational consumers will not alter the market as long as they do not predominate. So if some people choose wine by how much they like the label, they will not be harmed, but if many people start to do that, then wine with attractive labels will be overpriced.

For irrational consumers to be protected there has to be competition. Sometimes that competition does not exist. Consider the case of extended warranties on small appliances, typically a bad deal for consumers. To take a specific hypothetical example, suppose that a cell phone costs two hundred dollars. The cell phone has a free warranty for the first year, but the cell phone company offers, for twenty dollars, an extended warranty for the second year of the phone’s life. After that the consumer plans to buy a new phone. Suppose that the chance that the phone will break during the second year is 1 percent, so on average consumers will get two dollars’ worth of benefits from having this policy—but the price of the extended warranty is twenty dollars in order to include a normal profit to the insurer and a kickback (or commission) to the salesperson at the cell phone store.

Of course, Econ understand all this and thus do not purchase extended warranties. But Humans want extended warranties, perhaps because the salesman offers the “friendly” advice that the extended warranty is a good idea, or perhaps because they mistakenly think that cell phones break 15 percent of the time rather than 1 percent, or perhaps because they just think that it’s “better to be safe than sorry.”

What happens? Do market forces drive these unduly expensive extended warranties from the market? Or does competition drive the price of the extended warranties down to two dollars, the expected value of the claims? The answers to these questions are no and no. (Before we explain, notice that extended warranties are plentiful in the real world and that many people buy them. Hint: Don’t.)*

On our assumptions, the extended warranty is a product that simply should not exist. If Humans realized that they were paying twenty dollars for two dollars’ worth of insurance, they would not buy the insurance. But if they do not realize this, markets cannot and will not unravel the situation. Competition will not drive the price down, in part because it takes the salesperson a while to persuade someone to pay twenty dollars for two dollars’ worth of insurance, and in part because it is difficult for third parties to enter this market efficiently. You might think that firms could educate people not to buy the warranty, and indeed they might. But why should firms do that? If you are buying something that you shouldn’t, how do I make any money persuading you not to buy it?

There is a general point here. If consumers have a less than fully rational belief, firms often have more incentive to cater to that belief than to eradi-

*Consider the Simpsons episode in which Homer has a crayon hammered into his nose to lower his IQ. (Don’t ask.) The writers illustrate the lowering of Homer’s IQ by having Homer make ever-stupider statements. The surgeon knows the operation is complete when Homer finally exclaims: “Extended warranty! How can I lose?” (Thanks to Matthew Rabin for this tidbit.)
cate it. When many people were still afraid of flying, it was common to see airline flight insurance sold at airports at exorbitant prices. There were no booths in airports selling people advice not to buy such insurance.

In many markets, firms will be competing for the same consumers but will be offering products that are not merely different but that directly oppose each other. Some firms sell cigarettes; others sell products that help you quit smoking. Some firms sell fast food; others sell diet advice. If all consumers are Econs, then there is no reason to worry about which of these competing interests wins. But if some of the consumers are Humans who sometimes make bad choices (as judged by themselves, of course), then all of us may have an interest in which set of firms wins the battle. Government can, of course, outlaw some kinds of activities, but as libertarian paternalists we prefer to nudge—and we are keenly aware that governments are populated by Humans.

What can be done to help? In the next chapter we describe our primary tool: choice architecture.

Early in Thaler’s career, he was teaching a class on managerial decision making to business school students. Students would sometimes leave class early to go for job interviews (or a golf game) and would try to sneak out of the room as surreptitiously as possible. Unfortunately for them, the only way out of the room was through a large double door in the front, in full view of the entire class (though not directly in Thaler’s line of sight). The doors were equipped with large, handsome wood handles, vertically mounted cylindrical pulls about two feet in length. When the students came to these doors, they were faced with two competing instincts. One instinct says that to leave a room you push the door. The other instinct says, when faced with large wooden handles that are obviously designed to be grabbed, you pull. It turns out that the latter instinct trumps the former, and every student leaving the room began by pulling on the handle. Alas, the door opened outward.

At one point in the semester, Thaler pointed this out to the class, as one embarrassed student was pulling on the door handle while trying to escape the classroom. Thereafter, as a student got up to leave, the rest of the class would eagerly wait to see whether the student would push or pull. Amazingly, most still pulled! Their Automatic Systems triumphed; the signal emitted by that big wooden handle simply could not be screened out. (And when Thaler would leave that room on other occasions, he sheepishly found himself pulling too.)

Those doors are bad architecture because they violate a simple psycho-
logical principle with a fancy name: stimulus response compatibility. The idea is that you want the signal you receive (the stimulus) to be consistent with the desired action. When there are inconsistencies, performance suffers and people blunder.

Consider, for example, the effect of a large, red, octagonal sign that said GO. The difficulties induced by such incompatibilities are easy to show experimentally. One of the most famous such demonstrations is the Stroop (1935) test. In the modern version of this experiment people see words flashed on a computer screen and they have a very simple task. They press the right button if they see a word that is displayed in red, and press the left button if they see a word displayed in green. People find the task easy and can learn to do it very quickly with great accuracy. That is, until they are thrown a curve ball, in the form of the word GREEN displayed in red, or the word RED displayed in green. For these incompatible signals, response time slows and error rates increase. A key reason is that the Automatic System reads the word faster than the color naming system can decide the color of the text. See the word GREEN in red text and the non-thinking Automatic System rushes to press the left button, which is, of course, the wrong one. You can try this for yourself. Just get a bunch of colored crayons and write a list of color names, making sure that most of the names are not the same as the color they are written in. (Better yet, get a nearby kid to do this for you.) Then name the color names as fast as you can (that is, read the words and ignore the color): easy, isn’t it? Now say the color that the words are written in as fast as you can and ignore the word itself: hard, isn’t it? In tasks like this, Automatic Systems always win over Reflective ones.

Although we have never seen a green stop sign, doors such as the ones described above are commonplace, and they violate the same principle. Flat plates say “push me” and big handles say “pull me,” so don’t expect people to push big handles! This is a failure of architecture to accommodate basic principles of human psychology. Life is full of products that suffer from such defects. Isn’t it obvious that the largest buttons on a television remote control should be the power, channel, and volume controls? Yet how many remotes do we see that have the volume control the same size as the “input” control button (which if pressed accidentally can cause the picture to disappear)?

It is possible, however, to incorporate human factors into design, as

Don Norman’s wonderful book *The Design of Everyday Things* (1990) illustrates. One of his best examples is the design of a basic four-burner stove (Figure 5.1). Most such stoves have the burners in a symmetric arrangement, as in the stove pictured at the top, with the controls arranged in a linear fashion below. In this set-up, it is easy to get confused about which knob controls the front burner and which controls the back, and many pots and pans have been burned as a result. The other two designs we have illustrated are only two of many better possibilities.

Norman’s basic lesson is that designers need to keep in mind that the users of their objects are Humans who are confronted every day with myriad choices and cues. The goal of this chapter is to develop the same idea for choice architects. If you indirectly influence the choices other people make, you are a choice architect. And since the choices you are influencing are going to be made by Humans, you will want your architecture to reflect a good understanding of how humans behave. In particular, you will want to ensure that the Automatic System doesn’t get all confused. In this chapter, we offer some basic principles of good (and bad) choice architecture.

**Defaults: Padding the Path of Least Resistance**

For reasons we have discussed, many people will take whatever option requires the least effort, or the path of least resistance. Recall the discussion of inertia, status quo bias, and the “yeah, whatever” heuristic. All these forces imply that if, for a given choice, there is a default option—an option that will obtain if the chooser does nothing—then we can expect a large number of people to end up with that option, whether or not it is good for them. And as we have also stressed, these behavioral tendencies toward doing nothing will be reinforced if the default option comes with some implicit or explicit suggestion that it represents the normal or even the recommended course of action.

Defaults are ubiquitous and powerful. They are also unavoidable in the sense that for any node of a choice architecture system, there must be an associated rule that determines what happens to the decision maker if she does nothing. Of course, usually the answer is that if I do nothing, nothing changes; whatever is happening continues to happen. But not always.
Some dangerous machines, such as chain saws and lawn mowers, are designed with "dead man switches," so that once you are no longer gripping the machine, it stops. When you leave your computer alone for a while to answer a phone call, nothing is likely to happen until you have talked for a long time, at which point the screen saver comes on, and if you neglect the computer long enough, it may lock itself.

Of course, you can choose how long it takes before your screen saver comes on, but implementing that choice takes some action. Your computer probably came with a default time lag and a default screen saver. Chances are, those are the settings you still have.

Many organizations in both the public and the private sector have discovered the immense power of default options. Successful businesses certainly have. Remember the idea of automatic renewal for magazine subscriptions? If renewal is automatic, many people will subscribe, for a long time, to magazines they don't read. Business offices at most magazines are aware of that fact. When you download a new piece of software, you will often have numerous choices to make. Do you want the "regular" or "custom" installation? Normally, one of the boxes is already checked, indicating it is the default. Which boxes do the software suppliers check? Two different motives are readily apparent: helpful and self-serving. In the helpful category would be making the regular installation the default if most users will have trouble with the custom installation. In the self-serving category would be making the default a willingness to receive emails with information about new products. In our experience, most software comes with helpful defaults regarding the type of installation, but many come with self-serving defaults on other choices. We will have more to say about motives later. For now, note that not all defaults are selected to make the chooser's life easier or better.

The choice of the default can be quite controversial. Here is one example. An obscure portion of the No Child Left Behind Act requires that school districts supply the names, addresses, and telephone numbers of students to the recruiting offices of branches of the armed forces. However, the law stipulates that "a secondary school student or the parent of the student may request that the student's name, address, and telephone listing not be released without prior written parental consent, and the local educational agency or private school shall notify parents of the option..."
to make a request and shall comply with any request." Some school districts, such as Fairport, New York, interpreted this law as allowing them to implement an “opt-in” policy. That is, parents were notified that they could elect to make their children’s contact information available, but if they did not do anything, this information would be withheld.

This reading of the law did not meet with the approval of then-Secretary of Defense Donald Rumsfeld. The Defense and Education Departments sent a letter to school districts asserting that the law required an opt-out implementation. Only if parents actively requested that the contact information on their children be withheld would that option apply. In typical bureaucratic language, the departments contended that the relevant laws “do not permit LEA’s [local educational agencies] to institute a policy of not providing the required information unless a parent has affirmatively agreed to provide the information.”

Both the Defense Department and the school districts realized that opt-in and opt-out policies would lead to very different outcomes. Not surprisingly, much hue and cry ensued. We discuss a similarly touchy subject involving defaults in our chapter on organ donations.

We have emphasized that default rules are inevitable—that private institutions and the legal system cannot avoid choosing them. In some cases, though not all, there is an important qualification to this claim. The choice architect can force the choosers to make their own choice. We call this approach “required choice” or “mandated choice.” In the software example, required choice would be implemented by leaving all the boxes unchecked, and by requiring that at every opportunity one of the boxes be checked in order for people to proceed. In the case of the provision of contact information to the military recruiters, one could imagine a system in which all students (or their parents) are required to fill out a form indicating whether they want to make their contact information available. For emotionally charged issues like this one, such a policy has considerable appeal, because people might not want to be defaulted into an option that they might hate (but fail to reject because of inertia, or real or apparent social pressure).

We believe that required choice, favored by many who like freedom, is sometimes the best way to go. But consider two points about that approach. First, Humans will often consider required choice to be a nuisance or worse, and would much prefer to have a good default. In the software example, it is really helpful to know what the recommended settings are. Most users do not want to have to read an incomprehensible manual in order to determine which arcane setting to elect. When choice is complicated and difficult, people might greatly appreciate a sensible default. It is hardly clear that they should be forced to choose.

Second, required choosing is generally more appropriate for simple yes-no decisions than for more complex choices. At a restaurant, the default option is to take the dish as the chef usually prepares it, with the option to ask that certain ingredients be added or removed. In the extreme, required choosing would imply that the diner has to give the chef the recipe for every dish she orders! When choices are highly complex, required choosing may not be a good idea; it might not even be feasible.

**Expect Error**

Humans make mistakes. A well-designed system expects its users to err and is as forgiving as possible. Some examples from the world of real design illustrate this point:

- In the Paris subway system, Le Métro, users insert a paper card the size of a movie ticket into a machine that reads the card, leaves a record on the card that renders it "used," and then spits it out from the top of the machine. The cards have a magnetic strip on one side but are otherwise symmetric. On Thaler's first visit to Paris, he was not sure how to use the system, so he tried putting the card in with the magnetic strip face up and was pleased to discover that it worked. He was careful thereafter to insert the card with the strip face up. Many years and trips to Paris later, he was proudly demonstrating to a visiting friend the correct way to use the Metro system when his wife started laughing. It turns out that it doesn't matter which way you put the card into the machine!

  In stark contrast to Le Métro is the system used in most Chicago parking garages. When entering the garage, you put your credit card into a machine that reads it and remembers you. Then when leaving, you must insert the card again into another machine at the exit. This involves reaching out of the car window and inserting the card into a slot. Because credit cards are not symmetric, there are four possible ways to put the card into
the slot (face up or down, strip on the right or left). Exactly one of those ways is the right way. And in spite of a diagram above the slot, it is very easy to put the card in the wrong way, and when the card is spit back out, it is not immediately obvious what caused the card to be rejected or to recall which way it was inserted the first time. Both of us have been stuck for several painful minutes behind some idiot who was having trouble with this machine, and to admit to having occasionally been the idiot that is making all the people behind him start honking.

- Over the years, automobiles have become much friendlier to their Human operators. If you do not buckle your seat belt, you are buzzed. If you are about to run out of gas, a warning sign appears and you might be beeped. If you need an oil change, your car might tell you. Many cars come with an automatic switch for the headlights that turns them on when you are operating the car and off when you are not, eliminating the possibility of leaving your lights on overnight and draining the battery.

But some error-forgiving innovations are surprisingly slow to be adopted. Take the case of the gas tank cap. On any sensible car the gas cap is attached by a piece of plastic, so that when you remove the cap you cannot possibly drive off without it. Our guess is that this bit of plastic cannot cost more than ten cents. Once some firm had the good idea to include this feature, what excuse can there ever have been for building a car without one?

Leaving the gas cap behind is a special kind of predictable error psychologists call a “postcompletion” error. The idea is that when you have finished your main task, you tend to forget things relating to previous steps. Other examples include leaving your ATM card in the machine after getting your cash, or leaving the original in the copying machine after getting your copies. Most ATMs (but not all) no longer allow this error because you get your card back immediately. Another strategy, suggested by Norman, is to use what he calls a “forcing function,” meaning that in order to get what you want, you have to do something else first. So if in order to get your cash, you have to remove the card, you will not forget to do so.

- Another automobile-related bit of good design involves the nozzles for different varieties of gasoline. The nozzles that deliver diesel fuel are too large to fit into the opening on cars that use gasoline, so it is not possible to make the mistake of putting diesel fuel in your gasoline-powered car (though it is still possible to make the opposite mistake). The same principle has been used to reduce the number of errors involving anesthesia. One study found that human error (rather than equipment failure) caused 82 percent of the “critical incidents.” A common error was that the hose for one drug was hooked up to the wrong delivery port, so the patient received the wrong drug. This problem was solved by designing the equipment so that the gas nozzles and connectors were different for each drug, it became physically impossible to make this previously frequent mistake.

- A major problem in health care is called “drug compliance.” Many patients, especially the elderly, are on medicines they must take regularly, and in the correct dosage. So here is a choice-architecture question. If you are designing a drug, and you have complete flexibility, how often would you want your patients to have to take their medicine?

If we rule out a one-time dose administered immediately by the doctor (which would be best on all dimensions but is often technically infeasible), then the next-best solution is a medicine taken once a day, preferably in the morning. It is clear why once a day is better than twice (or more) a day, because the more often you have to take the drug, the more opportunities you have to forget. But frequency is not the only concern; regularity is also important. Once a day is much better than once every other day, because the Automatic System can be educated to think: “My pill(s) every morning, when I wake up.” Taking the pill becomes a habit, and habits are controlled by the Automatic System. By contrast, remembering to take your medicine every other day is beyond most of us. (Similarly, meetings that occur every week are easier to remember than those that occur every other week.) Some medicines are taken once a week, and most patients take this medicine on Sundays (because that day is different from other days for most people and thus easy to associate with taking one’s medicine).

Birth control pills present a special problem along these lines, because they are taken every day for three weeks and then skipped for one week. To solve this problem and to make the process automatic, the pills are typically sold in a special container that contains twenty-eight pills, each in a numbered compartment. Patients are instructed to take a pill every day, in order. The pills for days twenty-two through twenty-eight are placebos whose only role is to facilitate compliance for Human users.
While working on this book, Thaler sent an email to his economist friend Hal Varian, who is affiliated with Google. Thaler intended to attach a draft of the introduction to give Hal a sense of what the book was about, but forgot the attachment. When Hal wrote back to ask for the missing attachment, he noted with pride that Google was experimenting with a new feature on its email program “gmail” that would solve this problem. A user who mentions the word attachment but does not include one would be prompted, “Did you forget your attachment?” Thaler sent the attachment along and told Hal that this was exactly what the book was about.

Visitors to London who come from the United States or Europe have a problem being safe pedestrians. They have spent their entire lives expecting cars to come at them from the left, and their Automatic System knows to look that way. But in the United Kingdom automobiles drive on the left-hand side of the road, and so the danger often comes from the right. Many pedestrian accidents occur as a result. The city of London tries to help with good design. On many corners, especially in neighborhoods frequented by tourists, the pavement has signs that say, “Look right!”

Give Feedback

The best way to help Humans improve their performance is to provide feedback. Well-designed systems tell people when they are doing well and when they are making mistakes. Some examples:

- Digital cameras generally provide better feedback to their users than film cameras. After each shot, the photographer can see a (small) version of the image just captured. This eliminates all kinds of errors that were common in the film era, from failing to load the film properly (or at all), to forgetting to remove the lens cap, to cutting off the head of the central figure of the picture. However, early digital cameras failed on one crucial feedback dimension. When a picture was taken, there was no audible cue to indicate that the image had been captured. Modern models now include a very satisfying but completely fake “shutter click” sound when a picture has been taken. (Some cell phones, aimed at the elderly, include a fake dial tone, for similar reasons.)

- An important type of feedback is a warning that things are going wrong, or, even more helpful, are about to go wrong. Our laptops warn us to plug in or shut down when the battery is dangerously low. But warning systems have to avoid the problem of offering so many warnings that they are ignored. If our computer constantly nags us about whether we are sure we want to open that attachment, we begin to click “yes” without thinking about it. These warnings are thus rendered useless.

- The Department of Homeland Security’s color-coded terror alert system is a nice illustration of feedback that would be useless even if it weren’t incessant. When walking through an American airport any time since 2002, one is bound to hear the following announcement: “The Department of Homeland Security has raised the National Threat Advisory to Orange.” Aside from putting our toiletries into a one-quart zip-lock bag, exactly what actions are we expected to take as a result of this warning?

A look at the Homeland Security Web site provides the answer. We are told: “All Americans should continue to be vigilant, take notice of their surroundings, and report suspicious items or activities to local authorities immediately.” Weren’t we supposed to be doing this at level Yellow? It is a safe bet that these announcements are useless. (Much more useful would be a supply of one-quart zip-lock bags for absentminded travelers; and many airports do in fact provide these.)

- Feedback can be improved in many activities. Consider the simple task of painting a ceiling. This task is more difficult than it might seem because ceilings are nearly always painted white, and it can be hard to see exactly where you have painted. Later, when the paint dries, the patches of old paint will be annoyingly visible. How to solve this problem? Some helpful person invented a type of ceiling paint that goes on pink when wet but turns white when dry. Unless the painter is so colorblind that he can’t tell the difference between pink and white, this solves the problem.

Understanding “Mappings”: From Choice to Welfare

Some tasks are easy, like choosing a flavor of ice cream; other tasks are hard, like choosing a medical treatment. Consider, for example, an ice cream shop where the varieties differ only in flavor, not calories or other nutritional content. Selecting which ice cream to eat is merely a matter of choosing the one that tastes best. If the flavors are all familiar, such as vanilla, chocolate, and strawberry, most people will be able to predict with
considerable accuracy the relation between their choice and their ultimate consumption experience. Call this relation between choice and welfare a mapping. Even if there are some exotic flavors, the ice cream store can solve the mapping problem by offering a free taste.

Choosing among treatments for some disease is quite another matter. Suppose you are told that you have been diagnosed with prostate cancer and must choose among three options: surgery, radiation, and “watchful waiting” (which means do nothing for now). Each of these options comes with a complex set of possible outcomes regarding side effects of treatment, quality of life, length of life, and so forth. Comparing the options involves making such trade-offs as the following: Would I be willing to risk a one-third chance of impotence or incontinence in order to increase my life expectancy by 3.2 years? This is a hard decision at two levels. First, the patient is unlikely to know these trade-offs, and second, he is unlikely to be able to imagine what life would be like if he were incontinent. Yet here are two scary facts about this scenario. First, most patients decide which course of action to take in the very meeting at which their doctor breaks the bad news about the diagnosis. Second, the treatment option they choose depends strongly on the type of doctor they see. (Some specialize in surgery, others in radiation. None specialize in watchful waiting. Guess which option we suspect might be underutilized?)

The comparison between ice cream and treatment options illustrates the concept of mapping. A good system of choice architecture helps people to improve their ability to map and hence to select options that will make them better off. One way to do this is to make the information about various options more comprehensible, by transforming numerical information into units that translate more readily into actual use. If I am buying apples to make into apple cider, it helps to know the rule of thumb that it takes three apples to make one glass of cider.

Take the example of choosing a digital camera. Cameras advertise their megapixels, and the impression created is certainly that the more megapixels the better. This assumption is itself subject to question, because photos taken with more megapixels take up more room on the camera’s storage device and a computer’s hard drive. But what is really problematic for consumers is translating megapixels (not the most intuitive concept) into what they care about. Is it worth paying an additional hundred dollars to go from four to five megapixels? Suppose instead that manufacturers listed the largest print size recommended for a given camera. Instead of being given the options of three, five, or seven megapixels, consumers might be told that the camera can produce quality photos at 4×6 inches, 9×12, or “poster size.”

Often people have a problem in mapping products into money. For simple choices, of course, such mappings are trivial. If a Snickers bar costs one dollar, you can easily figure out how much it costs to have a Snickers bar every day. But do you know how much it costs you to use your credit card? Among the fees you may be paying are: (a) an annual fee for the privilege of using the card (common for cards that provide benefits such as frequent flyer miles); (b) an interest rate for borrowing money (that depends on your deemed credit worthiness); (c) a fee for making a payment late (and you may end up making more late payments than you anticipate); (d) interest on purchases made during the month that is normally not charged if your balance is paid off but begins if you make your payment one day late; and (e) a charge for buying things in currencies other than dollars.

Credit cards are not alone in having complex pricing schemes that are neither transparent nor comprehensible to consumers. Think about mortgages, cell phone calling plans, and auto insurance policies, just to name a few. For these and related domains, we propose a very mild form of government regulation, a species of libertarian paternalism that we call RECAP: Record, Evaluate, and Compare Alternative Prices.

Here is how RECAP would work in the cell phone market. The government would not regulate how much issuers could charge for services, but it would regulate their disclosure practices. The central goal would be to inform customers of every kind of fee that currently exists. This would not be done by printing a long unintelligible document in fine print. Instead, issuers would be required to make public their fee schedule in a spreadsheet-like format that would include all relevant formulas. Suppose you are in Toronto and your cell phone rings. How much is it going to cost you to answer it? What if you download some email? All these prices would be embedded in the formulas. This is the price disclosure part of the regulation.

The usage disclosure requirement would be that once a year, issuers would have to send their customers a complete listing of all the ways they
had used the phone and all the fees that had been incurred. This report would be sent two ways, by mail and, more important, electronically. The electronic version would also be stored and downloadable on a secure Web site.

Producing the RECAP reports would cost cell phone carriers very little, but the reports would be extremely useful for customers who want to compare the pricing plans of cell phone providers, especially after they had received their first annual statement. Private Web sites similar to existing travel sites would emerge to allow an easy way to compare services. With just a few quick clicks, a shopper would easily be able to import her usage data from the past year and find out how much various carriers would have charged, given her usage patterns.* Consumers who are new to the product (getting a cell phone for the first time, for example) would have to guess usage information for various categories, but the following year they could take full advantage of the system’s capabilities. We will see that in many domains, from mortgages and credit cards to energy use to Medicare, a RECAP program could greatly improve people’s ability to make good choices.

Structure Complex Choices

People adopt different strategies for making choices depending on the size and complexity of the available options. When we face a small number of well-understood alternatives, we tend to examine all the attributes of all the alternatives and then make trade-offs when necessary. But when the choice set gets large, we must use alternative strategies, and these can get us into trouble.

Consider, for example, Jane, who has just been offered a job at a company located in a large city far from where she is living now. Compare two choices she faces: which office to select and which apartment to rent. Suppose Jane is offered a choice of three available offices in her workplace. A reasonable strategy for her to follow would be to look at all three offices, note the ways they differ, and then make some decisions about the importance of such attributes as size, view, neighbors, and distance to the nearest rest room. This is described in the choice literature as a “compensatory” strategy, since a high value for one attribute (big office) can compensate for a low value for another (loud neighbor).

Obviously, the same strategy cannot be used to pick an apartment. In a large city like Los Angeles, thousands of apartments are available. If Jane ever wants to start working, she will not be able to visit each apartment and evaluate them all. Instead, she is likely to simplify the task in some way. One strategy to use is what Amos Tversky (1972) called “elimination by aspects.” Someone using this strategy first decides what aspect is most important (say, commuting distance), establishes a cutoff level (say, no more than a thirty-minute commute), then eliminates all the alternatives that do not come up to this standard. The process is repeated, attribute by attribute (no more than $1,500 per month; at least two bedrooms; dogs permitted), until either a choice is made or the set is narrowed down enough to switch over to a compensatory evaluation of the “finalists.”

When people are using a simplifying strategy of this kind, alternatives that do not meet the minimum cutoff scores may be eliminated even if they are fabulous on all other dimensions. So, for example, an apartment that is a thirty-five-minute commute will not be considered even if it has a dynamite view and costs two hundred dollars a month less than any of the alternatives.

Social science research reveals that as the choices become more numerous and/or vary on more dimensions, people are more likely to adopt simplifying strategies. The implications for choice architecture are related. As alternatives become more numerous and more complex, choice architects have more to think about and more work to do, and are much more likely to influence choices (for better or for worse). For an ice cream shop with three flavors, any menu listing those flavors in any order will do just fine, and effects on choices (such as order effects) are likely to be minor because people know what they like. As choices become more numerous, though, good choice architecture will provide structure, and structure will affect outcomes.

Consider the example of a paint store. Even ignoring the possibility of
special orders, paint companies sell more than two thousand colors that you can apply to the walls in your home. It is possible to think of many ways of structuring how those paint colors are offered to the customer. Imagine, for example, that the paint colors were listed alphabetically. Arctic White might be followed by Azure Blue, and so forth. While alphabetical order is a satisfactory way to organize a dictionary (at least if you have a guess as to how a word is spelled), it is a lousy way to organize a paint store.

Instead, paint stores have long used something like a paint wheel, with color samples ordered by similarity: all the blues are together, next to the greens, and the reds are located near the oranges, and so forth. The problem of selection is made considerably easier by the fact that people can see the actual colors, especially since the names of the paints are spectacularly uninformative. (On the Benjamin Moore Paints Web site, three similar shades of beige are called “Roasted Sesame Seed,” “Oklahoma Wheat,” and “Kansas Grain.”)

Thanks to modern computer technology and the World Wide Web, many problems of consumer choice have been made simpler. The Benjamin Moore Paints Web site not only allows the consumer to browse through dozens of shades of beige, but it also permits the consumer to see (within the limitations of the computer monitor) how a particular shade will work on the walls with the ceiling painted in a complementary color. And the variety of paint colors is small compared to the number of books sold by Amazon (millions) or Web pages covered by Google (billions). Many companies such as Netflix, the mail-order DVD rental company, succeed in part because of immensely helpful choice architecture. Customers looking for a movie to rent can easily search movies by actor, director, genre, and more, and if they rate the movies they have watched, they can also get recommendations based on the preferences of other movie lovers with similar tastes, a method called “collaborative filtering.” You use the judgments of other people who share your tastes to filter through the vast number of books or movies available in order to increase the likelihood of picking one you like. Collaborative filtering is an effort to solve a problem of choice architecture. If you know what people like you tend to like, you might well be comfortable in selecting products you don’t know, because people like you tend to like them. For many of us, collaborative filtering is making difficult choices easier.

A cautionary note: surprise and serendipity can be fun for people, and good for them too, and it may not be entirely wonderful if our primary source of information is about what people like us like. Sometimes it’s good to learn what people unlike us like—and to see whether we might even like that. If you like the mystery writer Robert B. Parker and we agree that he’s great, collaborative filtering will probably direct you to other mystery writers (we suggest trying Lee Child, by the way), but why not try a little Joyce Carol Oates, or maybe even Henry James? If you’re a Democrat, and you like books that fit your predilections, you might want to see what Republicans think; no party can possibly have a monopoly on wisdom. Public-spirited choice architects—those who run the daily newspaper, for example—know that it’s good to nudge people in directions that they might not have specifically chosen in advance. Structuring choice sometimes means helping people to learn, so they can later make better choices on their own.5

Incentives

Our last topic is the one with which most economists would have started: prices and incentives. Though we have been stressing factors that are often neglected by traditional economic theory, we do not intend to suggest that standard economic forces are unimportant. This is as good a point as any to state for the record that we believe in supply and demand. If the price of a product goes up, suppliers will usually produce more of it and consumers will usually want less of it. So choice architects must think about incentives when they design a system. Sensible architects will put the right incentives on the right people. One way to start to think about incentives is to ask four questions about a particular choice architecture:

Who uses?
Who chooses?
Who pays?
Who profits?

Free markets often solve all of the key problems by giving people an incentive to make good products and to sell them at the right price. If the market for sneakers is working well, there will be a lot of competition; bad
sneakers will be driven from the market and the good ones will be priced in accordance with people’s tastes. Sneaker producers and sneaker purchasers have the right incentives. But sometimes incentive conflicts arise. Consider a simple case. When we go for our weekly lunch, each of us chooses his own meal and pays for what he eats. The restaurant serves us our food and keeps our money. No conflicts here. Now suppose we decide to take turns paying for lunch. Sunstein now has an incentive to order something more expensive on the weeks that Thaler is paying, and vice versa. (In this case, though, friendship introduces a complication; one of us may well order something cheaper if he knows that the other is paying. Sentimental but true.)

Many markets (and choice architecture systems) are rife with incentive conflicts. Perhaps the most notorious is the U.S. health care system. The patient receives the health care services that are chosen by his physician and paid for by the insurance company, with everyone from equipment manufacturers to drug companies to malpractice lawyers taking a piece of the action. Those with different pieces have different incentives, and the results may not be ideal for either patients or doctors. Of course, this point is obvious to anyone who thinks about these problems. But as usual, it is possible to elaborate and enrich the standard analysis by remembering that the agents in the economy are Humans. To be sure, even mindless Humans demand less when they notice that the price has gone up. But will they notice? Only if they are really paying attention.

The most important modification that must be made to a standard analysis of incentives is salience. Do the choosers actually notice the incentives they face? In free markets, the answer is usually yes, but in important cases the answer is no. Consider the example of members of an urban family deciding whether to buy a car. Suppose their choices are to take taxis and public transportation or to spend ten thousand dollars to buy a used car, which they can park on the street in front of their home. The only salient costs of owning this car will be the weekly stops at the gas station, occasional repair bills, and a yearly insurance bill. The opportunity cost of the ten thousand dollars is likely to be neglected. (In other words, once they purchase the car, they tend to forget about the ten thousand dollars and stop treating it as money that could have been spent on something else.) In contrast, every time the family uses a taxi the cost will be in their face, with the meter clicking every few blocks. So a behavioral analysis of the incentives of car ownership will predict that people will overweight the opportunity costs of car ownership, and possibly other less salient aspects such as depreciation, and may overweight the very salient costs of using a taxi.* An analysis of choice architecture systems must make similar adjustments.

Of course, salience can be manipulated, and good choice architects can take steps to direct people’s attention to incentives. The telephones at the INSEAD School of Business in France are programmed to display the running costs of long-distance phone calls. If we want to protect the environment and to increase energy independence, similar strategies could be used to make costs more salient. Suppose the thermostat in your home was programmed to tell you the cost per hour of lowering the temperature a few degrees during the heat wave. This would probably have more effect on your behavior than quietly raising the price of electricity, a change that will be experienced only at the end of the month when the bill comes. Suppose in this light that government wants to increase energy conservation. Increases in the price of electricity will surely have an effect; making the increases salient will have a greater effect. Cost-disclosing thermostats might have a greater impact than (modest) price increases designed to decrease use of electricity.

In some domains, people may want the salience of gains and losses treated asymmetrically. For example, no one would want to go to a health club that charged its users on a “per step” basis on the Stairmaster. However, many Stairmaster users enjoy watching the “calories burned” meter while they work out (especially since those meters seem to give generous estimates of calories actually burned). Even better, for some, might be a pictorial display that indicated the calories one had burned in terms of food: after ten minutes one had earned only a bag of carrots but after forty minutes a large cookie.

We have sketched six principles of good choice architecture. As a concession to the bounded memory of our readers, we thought it might be

*Companies such as Zipcar that specialize in short-term rentals could profitably benefit by helping people solve these mental accounting problems.
useful to offer a mnemonic device to help recall the six principles. By rearranging the order, and using one small fudge, the following emerges.

iNcentives
Understand mappings
Defaults
Give feedback
Expect error
Structure complex choices

Voilà: NUDGES

With an eye on these NUDGES, choice architects can improve the outcomes for their Human users.

Not surprisingly, Humans differ dramatically from Econs in how they deal with money. Econs are sensible spenders and savers. They put money away for a rainy day, and for retirement, and they invest that money as if they had MBAs. When they borrow, Econs have no trouble choosing between fixed- and variable-rate mortgages, and they pay their credit card bills on time every month. If you are an Econ, you can skip this section of the book, unless you want to understand the behavior of your spouse, kids, and other Humans. A major goal of the next four chapters is to explore how people can do a better job at the difficult tasks of saving, investing, and borrowing. We also offer some suggestions about how private and public institutions might nudge people in directions that will make them a bit wealthier and more secure.