

Using Decision Errors to Help People Help Themselves

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Many of the most important problems currently facing the United States as well as other developed nations stem from arguably irrational behaviors on the part of individuals. For example, many of the health problems plaguing the United States, such as lung cancer, high blood pressure, and diabetes, are so-called lifestyle diseases that are exacerbated by unhealthy behaviors (Schroeder, 2007). Modifiable behaviors such as tobacco use, obesity-related behaviors, and alcohol abuse account for nearly one-third of all deaths in the United States, which only spends 2%–3% of the \$2.1 trillion spent on health each year on prevention (Flegal et al., 2005; Mokdad et al., 2000; Satcher, 2006; Woolf, 2007). Moreover, although there is an expanding array of beneficial medications available to deal with these and other health conditions—for example, to control blood pressure and cholesterol and to avoid strokes—the benefits of these medications are far from fully realized, in large part due to poor adherence rates among patients. Thus, for example, about half of patients who have a heart attack had stopped taking their cholesterol medication within a year of their heart attack (Jackevicius, Mamdani, and Tu, 2002). Likewise, as we discuss below, adherence to medication that prevents strokes, which is extremely inexpensive and effective, is remarkably low even in the best circumstances—a clinic devoted to administering it (Chiquette, Amato, and Bussey, 1998).

Other problems show similar patterns. For example, prior to the economic downturn, the savings rate in the United States was –1%, that is, individuals, on average, spent more than they earned. In 2000, the median net worth of American households, excluding home equity was \$13,473, and for households of age 65 and older, not much more—\$23,369 (U.S. Census Bureau, 2003, table A). Currently, only 40%

of Americans put money aside in company-sponsored 401(k) plans, and the median American family owns no stocks, even in retirement accounts (Bucks, Kennickell, and Moore, 2006). Yet, the average American family spends a staggering \$4,000 per year on gambling (ignoring the amount they receive back in the form of winnings). In a survey commissioned by the consumer federation of America in 2003, 86% of people said that financial planning was important to them, but only 46% indicated that they had developed such a plan (Consumer Federation of America, 2003). Americans want to save money, but many are failing to do so.

Standard Economics and Behavioral Economics

Economics is the discipline that is most closely associated with public policy. However, traditional economics is ill-equipped to deal with problems arising from suboptimal individual behavior because it is built on a rational-choice paradigm that effectively assumes that such problems do not exist. Thus, prominent economists have argued that addiction is the outcome of a rational choice (Becker and Murphy, 1988), that people are obese because they have judged that the pleasure of eating is worth the discounted costs (Murphy, 2006), and that suicide is a rational choice for those who judge that “the total discounted lifetime utility . . . reaches zero” (Hamermesh and Soss, 1974). The implication of analyses such as these is that interventions to reduce addiction, obesity, or suicide are likely to be counterproductive, since those who choose these behaviors are making an optimal decision to do so.

Behavioral economics is in a better position to provide policy solutions to problems that arise from individual behavior because it not only acknowledges that behavior is often far from optimal, but also identifies a variety of decision errors and judgmental biases that contribute to such departures from optimality. The central point of this paper is to argue that many of the same decision errors that produce self-destructive behavior can be used to people's benefit.

Behavioral Economics and Asymmetric Paternalism

By recognizing that even mature adults are subject to systematic decision errors, behavioral economics provides a potential rationale for paternalistic policies—policies intended to help individuals by improving the choices they make. Much like parents who intervene in the diets of their children, based on the assumption that children often do not know what is best for themselves and, even when they do, often do not act on that knowledge, behavioral economics opens the door to analogous policies applied to adults.

However, paternalism in its traditional, “heavy-handed,” form elicits widespread discomfort, and for good reason. One concern is that policy makers may not know what is best for individuals (see, e.g., Glaeser, 2006); a related argument is that people may have good reasons (that policy makers do not recognize) for behaving as they do. There is also a fear of regulatory capture, whereby paternalistic interventions ostensibly intended to protect individuals are in fact designed to help those being regulated. For example, it has been argued that cigarette companies knew that warning labels on cigarette packages would not deter smoking (the apparent intention of labels) but hoped that such labels would help to shield them from liability for health damages. Finally, by reducing, or even removing, individuals' freedom of choice, heavy-handed paternalism is unappealing to the many people, including many behavioral economists, who believe that autonomy of choice has inherent value.

Asymmetric paternalism (Camerer et al., 2003) seeks to obtain some of the benefits of paternalism while skirting the pitfalls of heavy-handed paternalism. It is based on two central tenets. First, paternalism is unavoidable: behavior is shaped by people's environments, and environments have to be structured in some way; there is no neutral way to structure an environment. Thaler and Sunstein (2003) illustrated this point with the example of a manager at a company cafeteria who is concerned about the well-being of employees and recognizes that they tend to load up on the first food they encounter in the food line. Deciding how to order an assortment of food in a cafeteria is unavoidable; food must be ordered *somehow*.

Given that inevitability, Thaler and Sunstein ask, why should the cafeteria manager not arrange the healthy food first in line so as to promote employee health?

The second tenet of asymmetric paternalism, which is also nicely illustrated by the cafeteria line, is that it is often possible to design interventions that help those who are behaving suboptimally without restricting the choices of those behaving optimally. In the case of the food line, people who mindlessly load up on the first food they encounter will eat more healthily, but someone who knowingly craves the double-cheese lasagna is at complete liberty to indulge that preference (For more on how people can be “nudged” to make better choices, see Thaler, Sunstein, and Balz, this volume).

There is, of course, some risk that overly zealous paternalists will go crazy engineering environments that direct people to conform to their own idiosyncratic views of what is best. However, we suspect that most asymmetric paternalistic interventions will be aimed at more prosaic goals that most people would embrace: quitting smoking, losing weight, saving for retirement, etc. In this chapter, we will skirt the meta-question of what it means for a person's behavior to be in their “best interest.” We simply assume that if an individual expresses a consistent desire to achieve a certain goal, such as losing weight, taking medications or saving money, it is relatively unobjectionable to help them achieve that goal in a fashion that does not restrict their ultimate freedom of choice.

Using Decision Errors to Help People: The Theory of the Second Best

The “theory of the second best” (Lipsey and Lancaster, 1956) refers to the situation that arises when one or more of the conditions for economic optimality are not satisfied. If one of the conditions for economic optimality is not satisfied, the theorem states, it is possible that economic efficiency will be best served by deviating from other conditions for optimality. That is, the second-best solution in a situation in which the first-best solution is not possible may involve other deviations from the conditions that are usually assumed to be optimal.

Although the theory of the second best was originally applied to market-level phenomena—to deviations from the characteristics of a “perfect market”—the same logic applies at the individual level. If an individual's behavior deviates from optimality in one way—for example, as a result of being excessively averse to taking risks, of overweighting immediate gratifications, or of being overconfident—the individual's best interests may not be served by behaving optimally in every other respect. Expressed more intuitively, decision errors can cancel one another out. Individuals will

not do as well making two errors as they would if they made no errors, but if those errors counteract one another sufficiently, people may do better making two errors than they would if they made only one error.

An example of such an error-canceling situation (although not cast by the authors in terms of the theory of the second best) was discussed by Kahneman and Lovallo (1993) in the context of entrepreneurship. They point out that if potential entrepreneurs are excessively averse to taking risks due to a distaste for experiencing losses (a phenomenon known as "loss aversion"), then it may actually be beneficial for them to also be overoptimistic about their chances of success. Entrepreneurs would do best to not be loss averse *or* overoptimistic, but if these errors balance one another out to some extent, they might do better on average if they exhibit both errors than if they exhibit only one.¹

Specific Decision Errors and How They Can Be Used to Improve Behaviors

Most, although not all, decision errors can be interpreted as instances of *misweighting*—of putting either too much weight or too little weight on specific types of costs and benefits. Although such misweighting generally degrades the quality of decision making when it occurs and is unavoidable, as suggested in the last section of the paper, it is sometimes possible to use other decision errors to produce a kind of compensatory *reweighting* that offsets the initial misweighting.

The Status-Quo, or "Default," Bias

The status-quo, or default, bias (e.g. Johnson and Goldstein, 2003; Kahneman, Knetsch, and Thaler, 1991; Samuelson and Zeckhauser, 1988) refers to people's tendency to take the "path of least resistance"—to keep doing what they have been doing, or to do what comes automatically, even when superior alternatives exist. Defaults have been blamed for a wide range of suboptimal outcomes, from the failure of employees to put aside retirement funds in companies with a default contribution rate of zero (Gneezy and Poters, 1997; Madrian and Shea, 2000; Thaler and Benartzi, 2004), to suboptimal allocations between investment alternatives (Thaler et al., 1997), to excessive ingestion of fries and large sodas as part of "supersized" meals at McDonald's (Halpern, Ubel, and Asch, 2007; Loewenstein, Brennan, and Volpp, 2007; Thaler and Sunstein, 2003). However, as many behavioral economists have pointed out, defaults (see, e.g., Johnson and Goldstein, this volume), if chosen

judiciously, can also be used to propel people toward self-beneficial behaviors. Thus, if individuals tended to be pathologically risk averse, by making the default investment portfolio riskier than people would naturally choose, people could be steered in the direction of incurring a more optimal level of risk.

Loss Aversion

Loss aversion is the tendency for people to put substantially greater weight on losses than gains (e.g. Kahneman, Knetsch, and Thaler, 1991; Tversky and Kahneman, 1991). It can produce a variety of suboptimal patterns of behavior, from pathological risk-aversion (as already discussed) to the tendency for people to hold on too long to houses (Genosove and Mayer, 2001) or stocks (e.g., Odean, 1998; Shefrin and Statman, 1985; Weber and Camerer, 1998). However, the same property that makes loss aversion destructive in some situations—its tendency to amplify the weight put on specific outcomes if they are framed as losses—can be used to advantage when people's natural tendency is to underweight outcomes. Thus, for example, if people are putting too little weight on delayed outcomes because they discount the future excessively, framing those delayed outcomes as losses can potentially increase the weight put on them—correcting one error with another.

Present-Biased Preferences

Present-biased preferences (e.g. Ainslie, 1975; Frederick, Loewenstein, and O'Donoghue, 2002; Loewenstein, 1992; Loewenstein and Angner, 2003; O'Donoghue, and Rabin, 1999, 2000), which are also referred to as hyperbolic time discounting, encompass two important behavioral propensities: (1) the tendency to overweight immediate costs and benefits relative to those occurring at any point in the future, and (2) the tendency to take a much more evenhanded approach to delayed costs and benefits occurring at different points in time. The notorious resolutions that one will begin to diet or save money *tomorrow* encompass both propensities: the overweighting of immediate costs deters one from the immediate misery of dieting or saving, but the more evenhanded perspective on future time makes one willing to impose these costs on oneself in the future. These two properties, in turn, suggest two ways that present-biased preferences can be used to advantage. First, the tendency to overweight immediate costs and benefits suggests that the motivational impact of costs and benefits—for example, rewards for good behavior or punishments for bad behavior—can be greatly increased by making them immediate, ideally

coinciding as closely as possible with the timing of behaviors they are attempting to encourage or deter. Second, the more even-handed attitude toward different times in the future suggests that people will be willing to commit to self-control devices that will be activated in the future that they would not be willing to commit to if they were to be activated immediately.

The Self-Serving Fairness Bias

The self-serving bias (e.g. Babcock et al., 1995) is the tendency for people to confuse what is in their own interest with what is fair. One of the hallmarks of the self-serving bias is the belief that one's biased view is in fact not biased but rather an impartial representation of reality—a phenomenon that Ross and Ward (1996) label naive realism. The upshot is that to the extent that parties believe that their own perspective reflects reality, they are also likely to think that their perspective will be shared by a neutral third party.

For example, the self-serving bias has been shown to play a critical role in negotiation impasse—in the failure to achieve settlement of a dispute even if it is in all parties' interests to do so. If people's perceptions of fairness are biased in a self-serving fashion, there may be no possible negotiated solution that all parties would perceive as fair. Again, however, this bias can be used to advantage in some situations by exploiting the fact that people tend to believe that their own biased perspective is neutral and objective and, hence, that it will be shared by a neutral third party. If people are convinced that a neutral third party will share their perspective, they may be willing to settle a dispute via arbitration, assuming an arbitrator can be located who, prior to rendering a decision, is perceived by all sides to be unbiased. Therefore, this bias, and in particular, people's ignorance that they are subject to it, can be used advantageously. Other chapters suggest ways in which this bias may potentially be overcome (Pronin and Schmidt, this volume; Ross, this volume).

Nonlinear Probability Weighting

Nonlinear probability weighting is another two-part effect (like present-biased preferences) that can be exploited to advantage. As encompassed in prospect theory (Kahneman and Tversky, 1979), (1) people tend to put disproportionate weight on outcomes that have a small probability of occurring but (2) also tend to be insensitive to variations in probability at the low end of the probability scale, a pattern Sunstein (this volume) refers to as probability neglect. Because people draw little distinction between, for example, a .00001 versus .0000001 chance of win-

ning a prize, even though the probabilities differ by several orders of magnitude, such overweighting is especially extreme for very small probabilities. The overweighting of small probabilities has various negative effects on decision making, such as, undoubtedly, contributing to the popularity of lotteries. However, the overweighting of small probabilities can be exploited by giving people lottery prizes rather than fixed amounts of money for good behavior, providing more "bang for the buck" from economic incentives that are designed to help people to engage in beneficial behaviors.

Peanuts Effects

The peanuts effect (Markowitz, 1952; Prelec and Loewenstein, 1991; Weber and Chapman 2005) is the common tendency to put little weight on very small outcomes—both gains and losses.² Like the overweighting of small probabilities, the peanuts effect encourages lottery play because the \$1 cost of a lottery ticket is viewed as peanuts—as "chump change" (Haisley, Mostafa, and Loewenstein, 2008). Generalized somewhat, the same term can encompass the underweighting of nebulous or amorphous, often delayed, consequences, which can help to explain such diverse self-destructive patterns of behavior as snacking, cigarette smoking, and talking on the cell phone while driving. In each of these cases, the benefits of the activity—for example, the pleasure of eating or smoking a cigarette—are immediate and tangible, but the costs—an infinitesimally small increase in the chance of lung cancer and other diseases, an imperceptible increase in weight, or a tiny increase in risk of injury or death—are amorphous. The peanuts effect can be viewed as a form of underweighting; however, again, this decision error can in some situations be channeled to help people rather than to hurt them. For example, the same tendency to underweight small outcomes that leads one to eat "one more chip" over and over can also make it relatively painless for people who might have trouble saving a large chunk of money in one fell swoop to instead make a large number of much smaller deposits, each one of which feels relatively painless.

Narrow Bracketing

Choice bracketing (e.g. Read, Loewenstein, and Rabin, 1999) is the process of grouping individual choices together into sets. When making choices, people can either group them *broadly*, by considering all of the consequences taken together (as standard economic theory assumes) or *narrowly*, by making each decision in isolation. A *bracketing effect* occurs when choice

outcomes under narrow bracketing differ from those under broad bracketing, and a general finding is that people tend to bracket narrowly: they myopically focus on the local consequence of the most immediately available choices and ignore the aggregated costs and benefits over a long time horizon (e.g., Herrnstein and Prelec, 1992; Sabini and Silver, 1982). This tendency becomes especially pronounced in temporal bracketing contexts where choices are made sequentially, the classic example being a phenomenon known as myopic loss aversion, in which risk aversion is heightened to the extent that investment decisions are made one decision at a time, neglecting the consequences of aggregation (Benartzi and Thaler, 1995; Gneezy and Potters, 1997). Bracketing effects interact with many other biases and can be used as a tool to induce these other biases. For example, the peanuts effect is more likely to occur when costs or benefits are framed narrowly, so, to the extent that the peanuts effect can be used to help people help themselves, narrow bracketing can in turn be used to increase the likelihood that people frame outcomes as "peanuts."

Projection Bias and Hot-Cold Empathy Gaps

Projection bias (Loewenstein, O'Donoghue, and Rabin, 2003) is the tendency for people to project their current preferences onto the future. Hot-cold empathy gaps, which often underlie projection bias, are the tendency for people to underestimate the impact of current emotions and drives and to fail to predict the impact of such emotions and drives on their own future behavior. People who are not hungry, for example, miscalculate their own future food choices, overestimating the likelihood that they will choose healthy options (Read and van Leeuwen, 1998) and judge other people who fail to show dietary moderation more harshly than they do when they themselves are hungry (Nordgren, van der Pligt, and van Harreveld, 2008).

Projection bias leads to diverse suboptimal patterns of behavior—from over-shopping on an empty stomach to excessive seeking of wealth and status (because one fails to anticipate the extent to which one will adapt to either). However, as we show below, because projection bias can cause people to underappreciate the misery of future self-denial, it can be used to encourage people to precommit to self-binding measures that help them to accomplish their long-term goals.

Overoptimism

Self-predictions of future behavior are systematically biased toward being overly optimistic. For example, research on the planning fallacy has shown that indi-

viduals tend to underestimate their task completion times (Buehler, Griffin, and Ross 1994, 2002). In the moral sphere, people have been found to overestimate the likelihood that they will engage in prosocial behavior, such as donating to charity (Epley and Dunning, 2000). In the health domain, people overestimate their future gym usage, and as a result opt for paying a flat rate for gym memberships, even though most would spend less if they were to pay on a per-visit basis (Della Vigna and Malmendier, 2006). Mail-in product rebates are a frequently cited example within the marketplace. Although such rebates have been shown to promote sales, only a small number of rebate coupons (5%–20%) are typically redeemed (Bulkeley, 1998). The optimistic bias apparent in people's self-predictions of their future behavior is especially striking given that in each of these examples the target behavior is largely under the individual's control. Later, we show how, when combined with projection bias, overoptimism can be used to facilitate weight loss.

In conclusion, as summarized in table 21.1, a wide range of biases that normally detract from the quality of decision making can be exploited in policies designed to enhance beneficial behaviors. The next section reviews a variety of such initiatives, including some that have been already tested and others that are still in the design phase.

Applications at the Individual Level

Saving

Perhaps the single most significant application of behavioral economics to public policy, so far, has been saving behavior. The problem of undersaving in the United States is particularly concerning because, far from implementing the types of policies that would be suggested by behavioral economics, the United States has been moving in the opposite direction. The easiest way for people to save is to have it done automatically, without the need for decision making or the imposition of self-control. The defined benefit pension plans that used to be the norm for moderate- and large-scale employers did just that; they required little if any decision making or deliberate deferral of gratification on the part of employees. The pervasive shift from defined benefit to defined contribution savings plans, however, shifted the burden of decision making and of deferral of gratification to the employee. In defined benefit savings plans, individuals have to save for their own retirement but get a tax break from the government as well, often as help from their employer in the form of a match on savings. Hence, the theory of the second best comes into play again, although in

Table 21.1 Biases that can be exploited in policies designed to enhance beneficial behaviors

Bias	How it can be used to a person's advantage
Status-quo/default bias	Make options that reflect a "correct" weighting of costs and benefit the default.
Loss aversion	Frame underweighted outcomes as losses; overweighted outcomes as (forgone) gains.
Present-biased preferences	Make rewards for beneficial behavior frequent and immediate. More evenhanded approach to delayed costs and benefits. Get people to commit to self-interested behavior ahead of time.
Self-serving fairness bias	Can be used to promote dispute-resolution (because negotiators underestimate the likelihood of judgments they view as unfair).
Nonlinear probability weighting	Provide probabilistic rewards for self-interested behavior.
Peanuts effect	Focus on small but frequent behaviors to increase the tangibility of underweighted costs and benefits, and decrease the tangibility of overweighted costs and benefits.
Bracketing	Bracket behavior narrowly. For added potency, combine with other decision errors (e.g. loss aversion; peanuts effect).
Projection bias and hot-cold empathy gaps	Set up mechanisms through which binding self-commitments are made in "cold" states.
Overoptimism	Use overoptimism to encourage precommitment.

a somewhat different way from that described earlier. The ideal—the first best—would have been to continue with defined benefit plans, albeit perhaps with modifications to enhance portability and to ensure the solvency of the underlying funds. However, given that we are not in this first-best situation, the fallback is to use ideas from psychology, specifically to exploit decision errors, to help ensure that people save for their retirement.

The main policy response to concerns about shortfalls in saving has been the usual economic remedy—to increase the effective return on saving by offering various tax breaks on defined contribution plans. There are, however, several problems with such an approach. First, it assumes that people are making a rational, deliberate trade-off between current and future consumption, but judging from the weak relationship between natural variations in interest rates and savings rates, the problem of undersaving is not mainly due to the perception that returns on saving are too low. In fact, standard economic theory is largely silent about the impact of an increase in the rate of return on saving on savings rates, given that a change in returns produces both a substitution effect (which makes future consumption more attractive) and an income effect (which renders saving for the future less necessary). Second, an increase in effective returns induced by tax exemptions is extremely inequitable, because the benefits accrue disproportionately

to those in the highest tax brackets, and inefficient, because those in the highest tax brackets who get the biggest tax discounts are already those who are most likely to save adequately; the problem of undersaving is a much bigger problem for low- and lower-middle-income families.³

Unlike approaches based on conventional economics, the essence of all interventions proposed and tested by behavioral economists has been to make increased saving the path of least resistance. Unlike attempts to increase saving through tax breaks, which result in a loss of tax revenue and yield no benefit to the extent that the money would have been saved even if the tax breaks were not offered, the behavioral remedies do not require additional government outlays or reductions in tax collections.

DEFAULTS

The best-known interventions to increase savings have involved changing default contribution levels to 401(k) plans (see discussion of the default bias above). For example, Madrian and Shea (2000) studied a company that changed from a default employee contribution rate of 0% to 3% and observed a steep increase in the fraction of employees saving through the plan, as well as an increase in average contribution rates. However, the change was not without problems. The company offered a 6% match; employee contributions

were matched one-to-one by the employer up to 6%, so the optimal level of contribution from the perspective of the employee was 6% (see Choi, Laibson, and Madrian, 2005). However, the percent of employees contributing 6% actually dropped after the plan was implemented, and some employees who would have saved at 6% instead saved at 3%, reflecting the power, but also the potential pitfalls of defaults. Moreover, the default investment allocation was to 100% money market, and, again reflecting the power of defaults, most employees left this allocation unchanged, whereas a much higher percentage had invested in stock before they got defaulted into the money market. This intervention and others like it are discussed in detail in other chapters of this volume (Benartzi, Peleg, and Thaler; Thaler, Sunstein, and Balz).

SAVE MORE TOMORROW

A very clever and highly successful program to increase savings devised by Thaler and Benartzi (2004) provides perhaps the single best example of using errors to help people. In their program, employees precommit to diverting some fraction of future wage increases into a retirement account. For example, an employee who could anticipate at least a 4% yearly increase in salary over upcoming years could elect to have half of that increase put into a retirement account over the next several years. Save More Tomorrow (SMarT) plays on three different biases. First, the save more *tomorrow* feature plays on the structure of present-biased preferences, and specifically on people's willingness to make far-sighted decisions for the future as long as they do not entail immediate sacrifice. Second, the fact that increments in saving come out of future wage increases plays on the idea that forgone gains are far less painful than out-of-pocket losses (Thaler 1980, 1985). Finally, the SMarT plan takes advantage of the status quo/default biases: without the human tendency to inertia, it is likely that people would change their mind about saving the money once tomorrow became today.

OTHER POSSIBLE APPROACHES

Currently, Emily Haisley and George Loewenstein are working on two programs to promote savings using lottery inducements. One program involves the design of a completely new type of state lottery ticket that allows customers to *simultaneously* play the lottery and save money. The proposed program draws on the same biases that make playing the lottery so attractive to people. A portion of the ticket's price is wagered in a typical lottery game and the remainder is deposited into a savings account. These tickets would

be sold through automatic ticket vending machines that also track account balances. An important feature of the program is an added incentive to continue to save and to keep account balances high. Each month, savers automatically get one bonus ticket for every \$100 they have on deposit in their account, which gives them the chance to win additional cash prizes. In addition, they receive a communication every time they add another \$100 to their account.

This program is designed to help low-income individuals overcome procrastination to save. Saving is challenging in part due to time discounting: the costs are immediate but the rewards are delayed far into the future. The peanuts effect also contributes to difficulty saving because any act of abstention from spending is likely to have a minimal impact on savings. This program plays on present-biased preferences and the overweighting of small probabilities by providing an *immediate* probabilistic reward for saving. Beside providing a motivation for saving, the pleasure and entertainment value of playing the lottery helps to negate the pain of self-denial.

The program also plays on the peanuts effect. People may dislike the pain of setting aside large sums of money all at once, but this program enables individuals to make small, frequent deposits. The program is likely to be particularly effective for low-income individuals, who, in addition to feeling this pain of saving, may have so little economic slack (as Mullainathan and Shafir call it in this volume) that they are unable to make large deposits. In addition, the ubiquity of lottery sales kiosks provides frequent reminders to purchase tickets.

A final feature of the program plays on the differential weighting of opportunity costs (foregone gains) and out-of-pocket costs (as discussed above in connection with the SMarT plan). The lottery is set up to give a high probability of a relatively small prize (e.g., \$30) and a very small probability of a very large jackpot. Although savers are informed of their winnings so they can fully enjoy their good fortune, the smaller winning amounts are, in fact, automatically deposited into the individual's savings account, reducing the temptation to spend.

Whether such a program would be beneficial depends on who, if anyone, would end up purchasing the new type of lottery ticket and where the money to make the purchases would come from. Ideally, purchases would be concentrated among people who are already playing the lottery and who would switch from purchasing conventional lottery tickets to purchasing the savings tickets. Much less ideal would be if the new lottery tickets brought people in to playing the lottery who were not playing before, and worse, if it led them to play the lottery with money

they otherwise would have put into saving. Clearly, a small-scale market test of such tickets would be desirable before they were introduced on a grand scale.

The second program involves an innovative design for individual development accounts (IDAs). IDAs are matched savings accounts for low-income individuals that are typically geared toward purchasing a home, paying for education, or starting a small business. IDAs usually employ a 2:1 match rate that allows the account holder to withdraw \$2 for every \$1 deposited, but only after reaching the savings goal. The same goal of encouraging saving can potentially be achieved at a much lower cost by replacing the guaranteed match with a lottery incentive. In the specific program being tested (Loibl, Haisley, and Loewenstein, in preparation), savers are guaranteed a fixed match of 1:1 on any money they put aside, and, in addition, are offered a lottery match. Specifically, there is a 1 in 10 chance that any amount they put aside will be matched 5-fold, and a 1 in 50 chance that any amount they put aside will be matched 25-fold.

Although tests of this idea are ongoing, there is a wealth of evidence that lottery-linked savings accounts can be applied successfully in low-income populations. In contrast to the IDA program just outlined, which offers a probabilistic match on deposits, most lottery-linked accounts offer prizes that are connected to balances rather than deposits. For example, many commercial banks outside of the United States offer lottery-linked savings accounts in which monthly drawings are held for cash and prizes, and customers get one lottery ticket for every \$*X* they have on deposit for the duration of the month (Guillen and Tschoegl, 2002). Similarly, many governments issue "prize" bonds, which periodically distribute the interest to just a few bond holders, and microfinance institutions give depositors "saving cards" that offer the chance to win prizes if a lottery drawing matches a portion of the serial number on the card. All of these lottery-linked accounts have been shown to draw customers from the lower end of the income distributions (see, e.g., Tufano, 2008). They benefit such customers by increasing their financial security, although invariably they offer reduced (and often zero) interest rates, with the difference used to cover the costs of the prizes.

Improving Health Behaviors

Schroeder (2007) highlighted the poor state of health outcomes in the United States relative to those in other developed countries and pointed out that the greatest opportunities for improvement in health do not involve further improvements in health-care delivery but, rather, changes in individual health behaviors.

Schroeder also notes that obesity and smoking, despite the reductions in prevalence of smoking over the past several decades, are the two most significant contributors, with smoking contributing to more than 400,000 deaths per year in the United States.

Whether these potential improvements in health can be achieved, however, depends on whether it is possible to change health behaviors. Clearly, the answer does not lie in the standard economic prescription—that is, providing more information. People are acutely aware of the health hazards of smoking. Indeed it has been argued that smokers tend to overestimate these hazards (Viscusi, 1992; although there is controversy on the issue; see Slovic, 2001), in which case giving people better information might only cause them to smoke *more*. Furthermore, about 70% of smokers say they want to quit smoking although only about 2%–3% per year succeed (Bartlett et al., 1994; Hughes, 2003). The problem is probably not the result of poorly informed decision making but rather of being unable to implement good intentions.

WEIGHT LOSS

Losing weight seems to be one of the most difficult goals to accomplish. In our hyper-weight-conscious society, people are powerfully motivated to lose weight yet are mostly unable to do so. The problem is so seemingly intractable that one prominent diet researcher, Janet Polivy, has coined the term *false hope syndrome* to describe the unfounded optimism of those who attempt different weight-loss strategies. The same researcher has conducted clinical tests of what she labels the "undiet," which simply involves giving up on the false hope of dieting. In one study comparing the undiet to various more optimistic dieting strategies, Polivy found that dieters and undieters gained about the same amount of weight, but those on the undiet reported fewer neurotic patterns of behavior and lower levels of depression (Polivy and Herman, 1992). If conventional diets do not work, does behavioral economics have any insights to offer about what might?

Results of a three-arm randomized controlled weight-loss trial (Volpp et al., 2008) provide hope that ideas from behavioral economics can be productively applied to weight loss. The study used financial incentives to motivate weight loss—loss aversion, overoptimism, and regret aversion—to help overweight people lose weight. Study participants (veterans in Philadelphia) were enrolled in a weight-loss program the goal of which was to lose 16 pounds in 16 weeks.

Two different types of incentive conditions were used and compared to a no-incentive control: a

lottery-based incentive and a deposit contract incentive. Study participants in the incentive conditions were required to call in their weight to the study nurse each day and were given daily feedback via text pagers. Accumulated incentives were paid out on a monthly basis once phoned-in weights were confirmed by a monthly weigh-in that took place at the clinic. This strategy played on loss aversion, because winnings during the month were received only if the participants continued to lose weight throughout the month and were below the monthly goal at the end-of-the-month in-person weighing. The combination of daily feedback but monthly payments has several advantages: (1) playing on present-biased preferences, and specifically the overweighting of immediate benefits, it gives people who attain their goals frequent positive feedback in the form of messages that they have been paid; (2) however, by paying people only monthly, it increases the likelihood that a significant amount of money will have been accumulated, thus avoiding potential peanuts effects; (3) finally, by giving both symbolic rewards delivered by message *and* real rewards delivered in the form of an immediately cashable check, it leverages the payments maximally; it is almost as if each payment is made twice.

The lottery incentive condition consisted of a daily lottery with an expected value of \$3 per day (1 in 5 chance of winning \$10, 1 in 100 chance of winning \$100), with subjects eligible for payment each day if they were on track to achieve their monthly weight-loss target. The design was motivated by the idea that lotteries tend to have greater incentive value than certain payments of the same expected value (see overweighting of small probabilities, discussed in "Nonlinear Probability Weighting," above), and that lottery players are motivated by both a forward-looking element (deriving from anticipation of the large payoff) and a backward-looking element based on the frequency of wins in the recent past (Camerer and Ho, 1999). Subjects were informed daily of the lottery outcome via their text pagers.

The lottery incentive condition also capitalizes on *regret aversion* by informing subjects who failed to attain their daily goal of whether they *would have* won had they met their target weight that day. Like the IDA savings program already discussed, the lottery intervention also plays on present-biased preferences by giving subjects rapid positive feedback for beneficial behaviors.

In the second incentive condition, deposit contract, subjects could deposit \$.01–\$3.00 per day of their own money, which was matched 1:1. Subjects reported their weight daily and received the sum of both amounts each day that they were on track to meeting their monthly weight-loss targets, but they

forfeited their deposit and match if they were not. They also received a fixed payment of \$3.00 each day they were under their targets.

The deposit contract condition plays on subjects' overoptimistic self-predictions (see the discussion in "Overoptimism," above). People tend to be overly optimistic in predicting how much weight they will lose (or similarly, fail to appreciate how difficult it is to lose weight); therefore, when asked to put money down at the beginning of the month toward attaining their weight-loss goals, about 91% of subjects were willing to do so, and of these participants, the average deposit contract increased during each month of participation, from \$1.35 in month 1 to \$1.59 in month 2 to \$1.83 in month 3, leveling off to \$1.85 in month 4. As the subjects struggled with losing weight, their desire to avoid losing the deposit provided added motivation to attain the weight-loss goal. Bound by their optimistic predictions and averse to losing their deposits, these participants ideally had their biases turn into a self-fulfilling prophecy.

The results of both interventions were dramatic: incentive participants lost over three times more weight than the controls. Whereas lottery and deposit contract participants lost an average of 13.1 and 14.0 pounds, respectively, the mean weight loss was significantly lower in the control condition ($M = 4.0$ pounds; Volpp et al., 2008a).

The appeal of this approach was also supported by the extremely low drop-out rate in the study. Only 9% of subjects dropped out of the study, a lost-to-follow-up rate that was much lower than is typical in weight-loss intervention studies, where rates are often as high as 40%–50%. Among subjects not lost to follow-up across both incentive arms, participants called in daily weights more than 90% of the time, indicating the feasibility of an approach that probably keeps weight loss salient among participants. The study's impressive results attest to the power of applying principles from behavioral economics to promote health behavior.

In a related vein, Wansink (this volume) discusses policies that could lead people to make healthier choices effortlessly. As in this chapter, where we argue that decision errors can be used to offset one another, the central premise of Wansink's discussion is that eating cues, such as packaging size, can be reversed to help people eat less food rather than more.

Despite the success of our weight-loss study, there are several caveats that must be acknowledged. First, once the incentives were removed at the end of the four-month study period, the participants in the two treatment groups gained back a significant fraction of the weight they had lost. Currently, we are testing whether this outcome could be avoided by running

a study in which incentives are offered for a longer period of time. Second, the program was relatively expensive and complicated to administer. Although we are currently testing the cost-effectiveness of removing the \$3 fixed payment from the deposit contract incentive, beyond this fixed payment, there are still significant costs, such as staffing the clinic for the monthly weigh-ins, processing phoned-in weights, and sending out text messages. If these functions could be automated (which now seems possible using available technology), the costs of running a program using deposit contracts would be substantially lower.

FURTHER (UNTESTED) WEIGHT-LOSS APPLICATIONS

FRAMING AND BRACKETING IN WEIGHT-LOSS PROGRAMS

As outlined in the section on specific decision errors, people tend to bracket decisions narrowly and to be susceptible to framing effects, yet these phenomena could be combined to people's advantage to facilitate weight loss. It is conceivable that the benefit of framing a diet broadly or narrowly might depend on a person's stage of dieting. Framing a weight-loss program broadly may make people particularly likely to sign up for one; indeed, the advertisements for many weightloss programs aggregate the amount of weight to be lost over the course of several months (e.g., "lose 10 pounds in 2 months" as opposed to "lose 0.16 pounds a day for 2 months"). Such a frame emphasizes the total weight loss while simultaneously downplaying the daily "grunt work" necessary to lose the weight. In other words, the broad frame may give an illusion of losing weight with minimal effort, thus helping to motivate people to initiate such a diet.

During intermediate stages of a diet, however, switching to narrow framing may make weight loss more manageable by breaking down the overall goal into subgoals that are easier to attain and monitor. This line of thinking is consistent with Gollwitzer's (1999) notion of implementation intentions. Applied to our weight-loss study, which we described earlier, the benefits of narrow framing could help to account for the success of our intervention. Participants in our program were required to monitor their weight on a daily basis (whereas controls were not). Further research will hopefully disentangle the effects of incentives and feedback on weight loss.

Finally, it may be helpful to switch back to broad framing toward the end stages of a diet, as a person approaches his goal, because doing so highlights the impressiveness of the overall weight loss. Because of goal gradients (Kivetz, Urminsky, and Zheng, 2006), such an emphasis is likely to be particularly motivating at the end stages of the diet.

STIMULATING PEOPLE TO EXERCISE

Beside dieting, of course, the other route to weight loss is exercise. Beyond weight loss, exercise has myriad benefits for physical and mental health, and even for cognitive functioning (e.g., Colcombe and Kramer, 2003; Folkins and Sime, 1981). Is it possible to use decision errors to encourage people to exercise more?

To some degree, decision errors already work to prompt people to exercise. People find flat-rate gym payment plans more palatable than per-visit ones, despite the fact that based on their usage (or rather, lack thereof), they would spend less if they were to pay on a per-visit basis (Della Vigna and Malmendier, 2006). This is sometimes referred to as the flat-rate bias (see, e.g., Lambrecht and Skiera, 2006). The flat-rate bias favors exercising because, after having joined an exercise club based on attraction to the flat rate, people are then often motivated to get their money's worth. Thus, the attempts by one author's mother to "get the price of a run down to \$2" on family ski trips. Such a tendency could be further amplified by giving people each time they visit the gym their "new per-visit price," which would decline the more they visited.

One can imagine, however, schemes that would go even further toward encouraging gym usage. For example, customers could be offered discounted flat-rate memberships if they pledge to visit the gym a certain number of times per month and agree to pay a fine if they do not attain this quota. Requiring fines to be paid in cash would make them particularly "painful" (Prelec and Loewenstein, 1998), thus making them an even more powerful detractor of underusage. Similar to the weight-loss deposit contract plan already discussed, such a scheme could make over-optimism self-fulfilling. Similar to people's over-optimism about adhering to a diet, people are likely to be overly optimistic about their propensity to exercise, leading them to be willing to accept fines if they do not exercise at a fairly high rate. Once they have implemented the fine scheme, however, people will be motivated by loss aversion to avoid being fined. This scheme is designed to stimulate exercise without limiting freedom of choice: customers are free to choose the higher-priced plan that does not require minimum monthly usage. Moreover, although we suspect this plan would generally increase the amount of exercise done, inevitably participants will occasionally come shy of their monthly quota. The gym club could use these funds to offset the cost of offering the discounted plan and of any upkeep costs associated with increased use of the gym.

This approach assumes that people who visit the gym actually exercise. Although we think this is plausible—indeed, often the hardest part of exercising is overcoming inertia to get to the gym in the first

place—the scheme could be combined with a lottery incentive to assure increased exercise. Work-out machines such as treadmills and ellipticals could provide payouts after a certain number of paces. The user exercising at the time the machine “hits the jackpot” would earn a prize. To make this lotterylike incentive more enticing, rewards deemed particularly attractive to the exerciser, such as massages and other spa treatments, could be used instead of monetary payments. It is conceivable that such a program would increase patronage of a particular facility, in turn boosting revenue that would more than offset the cost of its implementation.

MEDICATION ADHERENCE

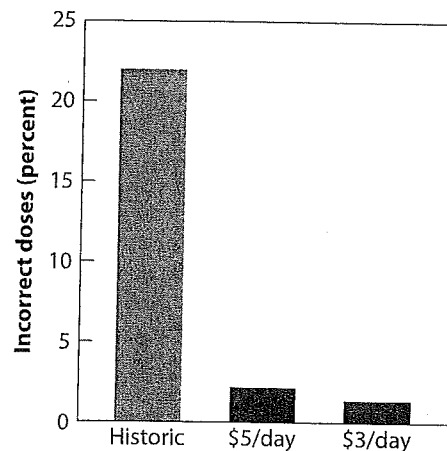
Poor adherence to certain prescription medications is common despite their manifest benefits. When taken properly, the drug warfarin, for example, reduces the risk of strokes by 68% overall and by 85% in patients older than 75 who have at least one other risk factor (Fuster et al., 1981; Laupacis et al., 1998; Petersen et al., 1989). Warfarin has been shown to be superior to aspirin. Because of poor compliance, however, these benefits are often not realized (Ansell et al., 1997; Cheng, 1997; Go et al., 1999; Kutner, Nixon, and Silverstone, 1991). One recent cohort study found that 40% of subjects missed 20% or more of their warfarin doses (Kimmel et al., 2007). Moreover, because warfarin taken incorrectly can be either ineffective or lead to a higher risk of bleeding and death, it has been estimated that between 45%–84% of patients with atrial fibrillation (an irregular heart beat that is a common indication for warfarin) and no contraindications for warfarin use did not receive the drug, placing them at a stroke risk several times greater than if properly anticoagulated with warfarin. This, indeed, may be the greatest negative consequence of poor adherence. The combination of proven benefits with low compliance rates in existing programs and low prescribing rates by physicians points to the need for new approaches for improving adherence. Enter behavioral economics.

In an attempt to improve adherence to warfarin regimens, Volpp and coauthors (Volpp et al., 2008) conducted pilot studies that tested the feasibility and potential effectiveness of a novel approach involving daily lottery incentives. In addition to drawing on behavioral economics, the intervention also makes use of a new technology—a computerized pillbox—that enhances the scalability of the approach.

In each of two pilots, ten patients on warfarin were provided with an Informedix Med-eMonitor System, which has a display screen and separate pill compartments that are labeled for each dose of the medication. Each device was programmed to communicate

by telephone with the study’s administrator. Participants were enrolled in a daily lottery; the expected value was \$5 per day for the first pilot study,⁴ and \$3 per day for the second. Although patients were enrolled in the lottery each day that they were instructed to take a pill, they were eligible to receive any earnings only if the Med-eMonitor had conveyed that they opened the appropriate pill compartment. The Med-eMonitor also was programmed to provide a daily reminder chime as well as a message that asked whether they had taken their medication.

The primary outcome was patient adherence and was calculated as “mean correct patient pill taking” based on the percentage of days in which each patient opened the correct compartment. In the first pilot study (\$5 per day expected value of lottery), 979 patient-days of warfarin use were recorded. Over this period, the mean correct pill taking was 97.7%, or only 2.3% incorrect pills, compared with a historic mean of 22% incorrect pill taking in this clinic population (fig. 21.1). Mean adherence ranged from 92% to 100% per patient. In the second pilot study (\$3 per day expected value of lottery), an additional 10 patients contributed a total of 813 days of warfarin use. Mean adherence was 98.4% (only 1.6% incorrect pills taken) and ranged from 92.1% to 100%, similar to the \$5-per-day pilot (fig. 21.1). Although opening pill compartments is an imperfect measure of pill taking (since patients could open the compartment but not take the pill), measurements of patients’ blood coagulation rates supported the conclusion that the lottery intervention helped. In the first pilot study, the proportion of out-of-range blood coagulation rates decreased from 35.0% pre-pilot to 12.2% post-pilot, a 65.2% improvement, and in the second pilot study, the blood coagulation rates that were out



21.1. Adherence under lotteries compared to historic controls.

of range decreased from 65.0% to 40.4%, a 37.9% improvement.

Similar to the incentive conditions of the weight-loss study, this study illustrates how a number of insights from behavioral economics—the importance of frequent feedback and incentives, the greater motivational power of lotteries of similarly valued certain payments, and the motivating force of anticipated regret—can be used to help people adhere to their medication regimens. These approaches have great potential to improve health behaviors but need to be systematically tested in a variety of clinical contexts and health delivery settings (Volpp et al., 2009).

Moving beyond the Individual: Applications at the Societal Level

While all of the applications discussed above have focused on helping individuals to help themselves, we will now explore how decision errors can be channeled instead to promote the public good. We will use the problems of global warming, charitable giving, and international conflicts to illustrate how our ideas can be applied to the public at large.

Global Warming

Although initiatives to increase individuals' consciousness about their contributions to global warming could have some impact, they are likely to, at most, make a small dent in the problem. Any serious solution to the problem is going to have to involve changes in prices, which could in some cases be enacted through taxes on energy use or subsidies for conservation. Thus, if gasoline were much more expensive in the United States, inevitably people would switch to more-fuel-efficient cars, and, in the long run, would be likely to alter their lifestyles—for example, by using public transportation or moving closer to their workplaces—in ways that reduced fuel consumption and hence emissions. However, the central point of this section is that monetary incentives of a given magnitude can have a greater or smaller impact on behavior depending on how they are implemented.

Thus, for example, insights from behavioral economics could be used to stimulate the use of public transportation. Funds currently allocated toward advertising could be redirected to a lottery-based incentive scheme. An electronic transportation pass card with a unique identifying number would be scanned each time a rider used the system. Every day, one pass-card number would be drawn, the bearer of which would receive a large prize *if she rode the system that*

day. Such a policy would capitalize on the tendency to overweight small probabilities, because people would be lured into using public transportation by the small chance of winning a prize. In the same way that the weight-loss and warfarin interventions leveraged incentives by playing on regret aversion, riders in this program could be informed if their number was drawn on a day in which they did not use the system. This program could be entirely voluntary: consumers would not be obligated to participate, but we suspect that people would rather be enrolled than not.⁵

As another application of reducing transportation emissions, Greenberg (2005) discussed how mental accounting concepts can be applied in designing pay-per-mile auto insurance products. He outlined the pay-as-you-drive-and-you-save (PAYDAYS) insurance program that features individualized premiums based not on the calendar year, but on the miles a person drives. Motorists thus have the incentive of saving money on insurance by driving less. The basic premise of mental accounting is that consumers categorize their spending into separate segments or “budgets.” The PAYDAYS program capitalizes on the notion that reducing the size of the insurance budget would result in decreased driving. Greenberg showed how the effect of mental accounting on reducing driving can be enhanced by applying additional behavioral economics insights, some of which we outline here and supplement with our own ideas.

FRAMING

Consumers are charged a surcharge for additional miles rather than a rebate for driving fewer than the specified number of miles. It follows from prospect theory that the former frame, in which additional driving is treated as a loss, would be more effective at reducing driving than the latter, which treats reduced driving as a windfall (gain).

PAIN OF PAYING

Research on the pain of paying (Prelec and Loewenstein, 1998) suggests that people would curtail their driving as insurance payments draw near in time because the cost of driving is salient around the time when the person makes the payment. Reduced driving may result immediately after payment while the pain of paying is still felt. This effect is bolstered by requiring consumers to make PAYDAYS payments frequently (narrow bracketing). Moreover, the pain of paying could be accentuated by equipping cars with taxi-like meters that make salient the cost of driving, much like some hybrid cars feature prominently displayed monitors indicating fuel consumption levels.

OVEROPTIMISM

The PAYDAYS program may appear especially attractive to those who overestimate their ability to cut their mileage. Such individuals may sign up for the lowest rates—rates that allow the least mileage and impose the heaviest fines on mileage overage. Then, similar to the weight-loss study discussed earlier, by virtue of having committed themselves to being virtuous and wanting to avoid fines, such individuals would be highly motivated to reduce their mileage.

In sum, by exploiting decision errors, pay per mile, which already is a good idea, could be made even more effective in achieving the goal of reducing miles driven, fuel used, and emissions.

These ideas alone would clearly be insufficient to have much of an impact on the problem of global warming. To be truly effective, they need to be paired with sweeping policy changes that increase the price of products such as gasoline to reflect their true environmental and social costs. However, these two examples illustrate an important point: that insights from behavioral economics could be applied to, in effect, supercharge such policy changes. For a more thorough discussion of how principles from psychology, behavioral economics, and behavioral decision research both contribute to and reduce global warming (and more generally, to improve environmental policy), see Weber (this volume).

Charitable Giving

In his influential book, *Living High and Letting Die* (1996), Peter Unger contrasted two scenarios a person might face. In the first, a man by the side of the road has a deep leg wound and needs immediate transportation to the hospital to avoid losing the leg. A person driving by considers helping and realizes that the blood from the victim's wound will ruin his fine leather seating and cost him \$5,000. In the second scenario, the driver receives a letter from UNICEF that requests a \$100 donation and informs the recipient, accurately, that unless he sends the check, several children who could be saved will instead die. The contrast is instructive because most people would harshly judge an individual who failed to help the man in the first scenario; yet the failure of so many of us to send the \$100 (as detailed in the second scenario) is in fact far more egregious on a variety of dimensions. If we would condemn the driver who failed to stop in the first scenario, it follows that those of us who are "living high" yet failing to donate a large fraction of our resources to those much less fortunate than ourselves, are making a moral error.

If affluent people are not giving as much as they, in some sense, *should*, what is responsible for the shortfall of generosity? One important cause is what Thomas Schelling referred to as the identifiable victim effect: people respond more emotionally and sympathetically to identifiable individuals than to statistics. In one study of the identifiable victim effect (Small and Loewenstein, 2003), sympathy was measured by asking participants who had received \$10 how much (if any) of the money they would donate to a victim, an individual who had also received \$10 but had been randomly selected to lose it. Each participant drew a number from a hat, and this number represented the victim to whom they could donate. Critically, participants stated their willingness to donate either before (unidentified victim) or after (identified victim) drawing the number. Donations were about twice as high in the identified (postdraw) than the unidentified (predraw) condition. That the "identified" victim was merely a number provides an especially powerful demonstration of the effect.

Real-world paradigmatic examples of the identifiable victim effect include Jessica McClure, a girl in Texas who fell into a well and received an outpouring of sympathy and aid, and a whale that accidentally swam up the Thames River and died in close proximity to London's millions. While McClure and the whale received a tremendous amount of attention, sympathy, and aid, the millions of girls who die each year worldwide from malnutrition, malaria, and dysentery, as well as the whales that die from whaling or from the pollution of the worlds' oceans, get far less sympathy and, more important, far less help.

The identifiable victim effect is only one of a number of patterns that can be observed in charitable giving that are not consistent with standard accounts of rational choice. More generally, we know that victims who are closer in time and space or who are visible evoke greater sympathy, and that knowing the victim's story or even being exposed to the right type of music can enhance sympathy.

Is it possible to use decision errors to increase charitable giving? The answer is that it is not only possible but also a widespread practice. For example, using decision errors to boost donations is the very basis of sponsor-a-child programs. By tying donations to specific children, these programs capitalize on identifiable victim effects (see Kogut and Ritov, 2005). Given that we suspect (and hope) that fundraising tactics tying donations to specific children in fact spread the resources more widely, such tactics employ decision errors to turn a second-best situation (a small number of children get disproportionate support, while others languish) into a situation that is closer to first-best (a larger number of children get

more evenhanded support, playing on the donors' tendency to be more generous toward individuals) (see Small, Loewenstein, and Strnad, 2006, for an extended discussion of this point). In addition, potential donors are typically asked to sponsor a child for "pennies a day." Asking for small but frequent donations uses the peanuts effect and narrow framing to mitigate the donor's money loss, in turn fostering donations. This is consistent with Gourville's (1998) explanation of the successes of public radio campaigns.

There are many other ways in which charitable organizations could leverage decision errors to boost donations. For example, in the spirit of Thaler and Benartzi's (2004) Save More Tomorrow program to increase employee saving, charitable organizations could launch a "donate more tomorrow" campaign. Committing to donate more in the future is more palatable than donating now due to present-biased preferences. The common practice of having donors provide "pledges" may in fact play on such psychological mechanisms.

Anchoring and insufficient adjustment (Tversky and Kahneman, 1974) can also be used to facilitate charitable giving. Indeed, salesmen capitalize on a variant of the phenomenon the "door-in-the-face" effect, wherein a very expensive product is initially suggested to the customer. Though people usually refuse the product, they often buy something more expensive than they would have had they not been presented with the initial anchor. While asking people to donate a huge sum of money upfront runs the risk of annoying people, it also may make it more likely that they will agree to donate a smaller amount.

Shang and Croson (2006) used a type of social-comparison-based anchoring manipulation to increase over-the-phone donations to a public radio station. They found that simply mentioning that an individual contacted previously had donated a large amount increased the magnitude of the focal donor's donation. A more subtle manipulation that would be worth testing would attempt to anchor potential donors on a truly arbitrary, but high, number. For example, the American Cancer Society could ask potential donors an initial question, How much do you think it would be worth to the country to cure cancer? Based on research showing the susceptibility of valuations of anchors, even completely irrelevant ones, such a procedure is likely to boost donations.

International Disputes

When traveling through the bucolic areas in which wars seem often to be fought, one cannot help but be impressed by the contrast between the present and

past. Families, towns, cities and even countries get torn apart by, as Shakespeare so aptly expressed it, the "dogs of war"—by destructive passions that sweep through populations like wildfire. Much like individuals who commit, and later pay the price for, crimes of passion, those caught up in mass hostilities often look back on their own feelings and behavior with perplexity, wondering how they could have acted as they did.

Wars, like individual self-destructive behavior, are often, prosaically, the product of individual-level irrationality. Although sometimes orchestrated or at least encouraged by those with "rational" economic interests in fomenting conflict, most wars are associated with a variety of decision errors. For example, people are often overconfident about their likelihood of prevailing, as was true at the beginning of World War I, when citizens of countries on both sides of the dispute anticipated quick victory for their own side. More important, perhaps, the passions of the moment tend to produce a variety of judgmental and motivational distortions (Loewenstein, 1996), such as a powerful motivation for immediate action (e.g., a need to act quickly rather than, for example, opt for diplomacy or the gradual effects of economic sanctions), dramatic self-serving biases when it comes to evaluating fairness, insensitivity to variations in probabilities, and extremes of sympathy, antipathy, and callousness (see Lobel and Loewenstein, 2005). Is it possible that judgmental biases can be harnessed in opposition to such effects?

As alluded to above, disputes not only tend to be the product of self-serving appraisals of the situation, but also tend to usher forth even more dramatically self-serving appraisals. In the heat of war, almost everything one's own side does is seen as benign and fair, whereas almost anything one's opponent does is interpreted in a much harsher light. As noted in the section on self-serving fairness bias, although such self-serving appraisals typically exacerbate conflict, they can also be used to enable the parties to agree on a common and respected third party to aid in the resolution of conflicts. Hence, the same self-serving bias that contributes to disputes can also be used to resolve them. For a discussion of additional ways in which engaging a third party can aid in international conflict resolution, see Ross (this volume).

Conclusion

When scrutinized superficially, the idea of using decision errors to help people might appear distasteful and misguided. Why should people have to be "tricked" into acting in their own self-interest? A more nuanced

perspective would view such uses of decision errors as a matter of balancing a playing field in which numerous corporate entities exploit decision errors in their efforts to compete in the marketplace.

There are a wide range of economic interests that exploit mistakes that consumers make (see Issacharoff and Delaney, 2006; Loewenstein and Haisley, 2008; Loewenstein and O'Donoghue, 2006). Credit card companies lure consumers with "teaser" rates that play on their naivety about their future propensity to go into debt.⁶ Fast-food restaurants offer "meal deals" that would not be nearly as attractive if consumers entered calories and health consequences into their decision calculus. Cigarette and alcohol sellers broadcast ads that cast the poisoning of one's own body as a romantic, sophisticated, activity. Banks make an increasing fraction of their profits from overdraft fees that consumers do not pay much attention to when they choose where to open an account and then get "stung" by. Mortgage companies encourage consumers to assume loans they cannot afford, then the companies support legislation that makes it more difficult to declare bankruptcy and walk away from one's debts. Even states get into the game of playing on decision errors, marketing lottery tickets that return approximately 45 cents on the dollar that they sell disproportionately to those least able to afford them. The associated marketing efforts encourage simplistic assessments of probabilities—for example, the ubiquitous "you can't win if you don't play." There are many more such examples.

With the possible exception of states, which arguably should not be in the business of exploiting poor people, these economic entities are not inherently evil; they are just competing in the marketplace. If some bank or mortgage company failed to exploit consumer errors, and its competitors did, it would lose profits and risk going out of business. When consumers make systematic errors, and one can no longer assume that they are fully capable of taking actions consistent with their self-interest, there is a very real possibility that the "invisible hand" of the market will lead to the opposite result that Adam Smith envisioned.

In the best of all worlds, we could rely on the inherent rationality of individuals to help guide them through the shoals of capitalist and state enterprises that play on their biases and irrationalities. As the examples we have highlighted in this chapter suggest, however, the outcome of such a laissez-faire approach is clearly suboptimal. In the world we live in, in contrast, there are many adverse consequences of leaving consumers to fend for themselves. Harnessing the same errors that are regularly used to exploit consumers to instead help them could make many people better off.

Notes

1. Another closely related example that also involves overconfidence comes from the work of Benabou and Tirole (2002). They discuss how overconfidence in one's own abilities can in some cases counteract the reluctance, due to present-biased preferences, to engage in risky endeavors that involve an immediate outlay of effort for a delayed benefit. If people overestimate their chances of success, they may make the effort when the immediacy of costs would otherwise deter them from doing so.

2. The peanuts effect is closely related to the marketing ploy of framing costs in terms of "pennies a day" (see Gourville, 1998).

3. To deal with this problem, Gale, Gruber, and Orszag (2006) propose an alternative to the current tax-deduction-based system, which provides disproportionate benefits to savers who are in high tax brackets. In their proposal, the government would provide a 30% match to all households making a qualified contribution to a 401(k) plan or IRA account.

4. Due to a clerical error, the expected value was greater than intended. Subjects won \$10 if either of their digits matched with either of the digits drawn for that day, doubling the likelihood of winning \$10 above what we intended for an expected value of \$5 per day. Rather than ending the trial when we discovered the error, we completed it and started a new trial with another 10 patients and the lottery implemented correctly with an expected value of \$3 per day.

5. Although one might fear that car manufacturers would offer a similar program if they saw that it worked, current laws in the United States do place some restrictions on commercial entities from offering lotteries that are contingent on product usage (albeit, seemingly, mainly from offering such lottery-linked products via mail solicitations).

6. It is unlikely that these types of marketing practices are going to be regulated; if anything, there has been a tendency to move in the opposite direction—for example, with recent legislation that permits credit card accounts in which an individual's tax-free retirement savings serves as collateral.

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