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Do You Suffer From Decision Fatigue?

By JOHN TIERNEY

Three men doing time in Israeli prisons recently appeared before a parole board consisting of a judge, a criminologist and a social worker. The three prisoners had completed at least two-thirds of their sentences, but the parole board granted freedom to only one of them. Guess which one:

Case 1 (heard at 8:50 a.m.): An Arab Israeli serving a 30-month sentence for fraud.

Case 2 (heard at 3:10 p.m.): A Jewish Israeli serving a 16-month sentence for assault.

Case 3 (heard at 4:25 p.m.): An Arab Israeli serving a 30-month sentence for fraud.

There was a pattern to the parole board's decisions, but it wasn't related to the men's ethnic backgrounds, crimes or sentences. It was all about timing, as researchers discovered by analyzing more than 1,100 decisions over the course of a year. Judges, who would hear the prisoners' appeals and then get advice from the other members of the board, approved parole in about a third of the cases, but the probability of being paroled fluctuated wildly throughout the day. Prisoners who appeared early in the morning received parole about 70 percent of the time, while those who appeared late in the day were paroled less than 10 percent of the time.

The odds favored the prisoner who appeared at 8:50 a.m. — and he did in fact receive parole. But even though the other Arab Israeli prisoner was serving the same sentence for the same crime — fraud — the odds were against him when he appeared (on a different day) at 4:25 in the afternoon. He was denied parole, as was the Jewish Israeli prisoner at 3:10 p.m, whose sentence was shorter than that of the man who was released. They were just asking for parole at the wrong time of day.

There was nothing malicious or even unusual about the judges' behavior, which was reported earlier this year by Jonathan Levav of Stanford and Shai Danziger of Ben-Gurion University. The judges' erratic judgment was due to the occupational hazard of being, as

George W. Bush once put it, “the decider.” The mental work of ruling on case after case, whatever the individual merits, wore them down. This sort of decision fatigue can make quarterbacks prone to dubious choices late in the game and C.F.O.’s prone to disastrous dalliances late in the evening. It routinely warps the judgment of everyone, executive and nonexecutive, rich and poor — in fact, it can take a special toll on the poor. Yet few people are even aware of it, and researchers are only beginning to understand why it happens and how to counteract it.

Decision fatigue helps explain why ordinarily sensible people get angry at colleagues and families, splurge on clothes, buy junk food at the supermarket and can’t resist the dealer’s offer to rustproof their new car. No matter how rational and high-minded you try to be, you can’t make decision after decision without paying a biological price. It’s different from ordinary physical fatigue — you’re not consciously aware of being tired — but you’re low on mental energy. The more choices you make throughout the day, the harder each one becomes for your brain, and eventually it looks for shortcuts, usually in either of two very different ways. One shortcut is to become reckless: to act impulsively instead of expending the energy to first think through the consequences. (Sure, tweet that photo! What could go wrong?) The other shortcut is the ultimate energy saver: do nothing. Instead of agonizing over decisions, avoid any choice. Ducking a decision often creates bigger problems in the long run, but for the moment, it eases the mental strain. You start to resist any change, any potentially risky move — like releasing a prisoner who might commit a crime. So the fatigued judge on a parole board takes the easy way out, and the prisoner keeps doing time.

Decision fatigue is the newest discovery involving a phenomenon called ego depletion, a term coined by the social psychologist Roy F. Baumeister in homage to a Freudian hypothesis. Freud speculated that the self, or ego, depended on mental activities involving the transfer of energy. He was vague about the details, though, and quite wrong about some of them (like his idea that artists “sublimate” sexual energy into their work, which would imply that adultery should be especially rare at artists’ colonies). Freud’s energy model of the self was generally ignored until the end of the century, when Baumeister began studying mental discipline in a series of experiments, first at Case Western and then at Florida State University.

These experiments demonstrated that there is a finite store of mental energy for exerting self-control. When people fended off the temptation to scarf down M&M’s or freshly baked chocolate-chip cookies, they were then less able to resist other temptations. When they forced themselves to remain stoic during a tearjerker movie, afterward they gave up more

quickly on lab tasks requiring self-discipline, like working on a geometry puzzle or squeezing a hand-grip exerciser. Willpower turned out to be more than a folk concept or a metaphor. It really was a form of mental energy that could be exhausted. The experiments confirmed the 19th-century notion of willpower being like a muscle that was fatigued with use, a force that could be conserved by avoiding temptation. To study the process of ego depletion, researchers concentrated initially on acts involving self-control — the kind of self-discipline popularly associated with willpower, like resisting a bowl of ice cream. They weren't concerned with routine decision-making, like choosing between chocolate and vanilla, a mental process that they assumed was quite distinct and much less strenuous. Intuitively, the chocolate-vanilla choice didn't appear to require willpower.

But then a postdoctoral fellow, Jean Twenge, started working at Baumeister's laboratory right after planning her wedding. As Twenge studied the results of the lab's ego-depletion experiments, she remembered how exhausted she felt the evening she and her fiancé went through the ritual of registering for gifts. Did they want plain white china or something with a pattern? Which brand of knives? How many towels? What kind of sheets? Precisely how many threads per square inch?

"By the end, you could have talked me into anything," Twenge told her new colleagues. The symptoms sounded familiar to them too, and gave them an idea. A nearby department store was holding a going-out-of-business sale, so researchers from the lab went off to fill their car trunks with simple products — not exactly wedding-quality gifts, but sufficiently appealing to interest college students. When they came to the lab, the students were told they would get to keep one item at the end of the experiment, but first they had to make a series of choices. Would they prefer a pen or a candle? A vanilla-scented candle or an almond-scented one? A candle or a T-shirt? A black T-shirt or a red T-shirt? A control group, meanwhile — let's call them the nondeciders — spent an equally long period contemplating all these same products without having to make any choices. They were asked just to give their opinion of each product and report how often they had used such a product in the last six months.

Afterward, all the participants were given one of the classic tests of self-control: holding your hand in ice water for as long as you can. The impulse is to pull your hand out, so self-discipline is needed to keep the hand underwater. The deciders gave up much faster; they lasted 28 seconds, less than half the 67-second average of the nondeciders. Making all those choices had apparently sapped their willpower, and it wasn't an isolated effect. It was confirmed in other experiments testing students after they went through exercises like

choosing courses from the college catalog.

For a real-world test of their theory, the lab's researchers went into that great modern arena of decision making: the suburban mall. They interviewed shoppers about their experiences in the stores that day and then asked them to solve some simple arithmetic problems. The researchers politely asked them to do as many as possible but said they could quit at any time. Sure enough, the shoppers who had already made the most decisions in the stores gave up the quickest on the math problems. When you shop till you drop, your willpower drops, too.

Any decision, whether it's what pants to buy or whether to start a war, can be broken down into what psychologists call the Rubicon model of action phases, in honor of the river that separated Italy from the Roman province of Gaul. When Caesar reached it in 49 B.C., on his way home after conquering the Gauls, he knew that a general returning to Rome was forbidden to take his legions across the river with him, lest it be considered an invasion of Rome. Waiting on the Gaul side of the river, he was in the "predecisional phase" as he contemplated the risks and benefits of starting a civil war. Then he stopped calculating and crossed the Rubicon, reaching the "postdecisional phase," which Caesar defined much more felicitously: "The die is cast."

The whole process could deplete anyone's willpower, but which phase of the decision-making process was most fatiguing? To find out, Kathleen Vohs, a former colleague of Baumeister's now at the University of Minnesota, performed an experiment using the self-service Web site of Dell Computers. One group in the experiment carefully studied the advantages and disadvantages of various features available for a computer — the type of screen, the size of the hard drive, etc. — without actually making a final decision on which ones to choose. A second group was given a list of predetermined specifications and told to configure a computer by going through the laborious, step-by-step process of locating the specified features among the arrays of options and then clicking on the right ones. The purpose of this was to duplicate everything that happens in the postdecisional phase, when the choice is implemented. The third group had to figure out for themselves which features they wanted on their computers and go through the process of choosing them; they didn't simply ponder options (like the first group) or implement others' choices (like the second group). They had to cast the die, and that turned out to be the most fatiguing task of all. When self-control was measured, they were the one who were most depleted, by far.

The experiment showed that crossing the Rubicon is more tiring than anything that happens on either bank — more mentally fatiguing than sitting on the Gaul side contemplating your

options or marching on Rome once you've crossed. As a result, someone without Caesar's willpower is liable to stay put. To a fatigued judge, denying parole seems like the easier call not only because it preserves the status quo and eliminates the risk of a parolee going on a crime spree but also because it leaves more options open: the judge retains the option of paroling the prisoner at a future date without sacrificing the option of keeping him securely in prison right now. Part of the resistance against making decisions comes from our fear of giving up options. The word "decide" shares an etymological root with "homicide," the Latin word "caedere," meaning "to cut down" or "to kill," and that loss looms especially large when decision fatigue sets in.

Once you're mentally depleted, you become reluctant to make trade-offs, which involve a particularly advanced and taxing form of decision making. In the rest of the animal kingdom, there aren't a lot of protracted negotiations between predators and prey. To compromise is a complex human ability and therefore one of the first to decline when willpower is depleted. You become what researchers call a cognitive miser, hoarding your energy. If you're shopping, you're liable to look at only one dimension, like price: just give me the cheapest. Or you indulge yourself by looking at quality: I want the very best (an especially easy strategy if someone else is paying). Decision fatigue leaves you vulnerable to marketers who know how to time their sales, as Jonathan Levav, the Stanford professor, demonstrated in experiments involving tailored suits and new cars.

The idea for these experiments also happened to come in the preparations for a wedding, a ritual that seems to be the decision-fatigue equivalent of Hell Week. At his fiancée's suggestion, Levav visited a tailor to have a bespoke suit made and began going through the choices of fabric, type of lining and style of buttons, lapels, cuffs and so forth.

"By the time I got through the third pile of fabric swatches, I wanted to kill myself," Levav recalls. "I couldn't tell the choices apart anymore. After a while my only response to the tailor became 'What do you recommend?' I just couldn't take it."

Levav ended up not buying any kind of bespoke suit (the $2,000 price made that decision easy enough), but he put the experience to use in a pair of experiments conducted with Mark Heitmann, then at Christian-Albrechts University in Germany; Andreas Herrmann, at the University of St. Gallen in Switzerland; and Sheena Iyengar, of Columbia. One involved asking M.B.A. students in Switzerland to choose a bespoke suit; the other was conducted at German car dealerships, where customers ordered options for their new sedans. The car buyers — and these were real customers spending their own money — had to choose, for instance, among 4 styles of gearshift knobs, 13 kinds of wheel rims, 25 configurations of the

engine and gearbox and a palette of 56 colors for the interior.

As they started picking features, customers would carefully weigh the choices, but as decision fatigue set in, they would start settling for whatever the default option was. And the more tough choices they encountered early in the process — like going through those 56 colors to choose the precise shade of gray or brown — the quicker people became fatigued and settled for the path of least resistance by taking the default option. By manipulating the order of the car buyers' choices, the researchers found that the customers would end up settling for different kinds of options, and the average difference totaled more than 1,500 euros per car (about $2,000 at the time). Whether the customers paid a little extra for fancy wheel rims or a lot extra for a more powerful engine depended on when the choice was offered and how much willpower was left in the customer.

Similar results were found in the experiment with custom-made suits: once decision fatigue set in, people tended to settle for the recommended option. When they were confronted early on with the toughest decisions — the ones with the most options, like the 100 fabrics for the suit — they became fatigued more quickly and also reported enjoying the shopping experience less.

Shopping can be especially tiring for the poor, who have to struggle continually with trade-offs. Most of us in America won't spend a lot of time agonizing over whether we can afford to buy soap, but it can be a depleting choice in rural India. Dean Spears, an economist at Princeton, offered people in 20 villages in Rajasthan in northwestern India the chance to buy a couple of bars of brand-name soap for the equivalent of less than 20 cents. It was a steep discount off the regular price, yet even that sum was a strain for the people in the 10 poorest villages. Whether or not they bought the soap, the act of making the decision left them with less willpower, as measured afterward in a test of how long they could squeeze a hand grip. In the slightly more affluent villages, people's willpower wasn't affected significantly. Because they had more money, they didn't have to spend as much effort weighing the merits of the soap versus, say, food or medicine.

Spears and other researchers argue that this sort of decision fatigue is a major — and hitherto ignored — factor in trapping people in poverty. Because their financial situation forces them to make so many trade-offs, they have less willpower to devote to school, work and other activities that might get them into the middle class. It's hard to know exactly how important this factor is, but there's no doubt that willpower is a special problem for poor people. Study after study has shown that low self-control correlates with low income as well as with a host of other problems, including poor achievement in school, divorce, crime,

alcoholism and poor health. Lapses in self-control have led to the notion of the "undeserving poor" — epitomized by the image of the welfare mom using food stamps to buy junk food — but Spears urges sympathy for someone who makes decisions all day on a tight budget. In one study, he found that when the poor and the rich go shopping, the poor are much more likely to eat during the shopping trip. This might seem like confirmation of their weak character — after all, they could presumably save money and improve their nutrition by eating meals at home instead of buying ready-to-eat snacks like Cinnabons, which contribute to the higher rate of obesity among the poor. But if a trip to the supermarket induces more decision fatigue in the poor than in the rich — because each purchase requires more mental trade-offs — by the time they reach the cash register, they'll have less willpower left to resist the Mars bars and Skittles. Not for nothing are these items called impulse purchases.

And this isn't the only reason that sweet snacks are featured prominently at the cash register, just when shoppers are depleted after all their decisions in the aisles. With their willpower reduced, they're more likely to yield to any kind of temptation, but they're especially vulnerable to candy and soda and anything else offering a quick hit of sugar. While supermarkets figured this out a long time ago, only recently did researchers discover why.

The discovery was an accident resulting from a failed experiment at Baumeister's lab. The researchers set out to test something called the Mardi Gras theory — the notion that you could build up willpower by first indulging yourself in pleasure, the way Mardi Gras feasters do just before the rigors of Lent. In place of a Fat Tuesday breakfast, the chefs in the lab at Florida State whipped up lusciously thick milkshakes for a group of subjects who were resting in between two laboratory tasks requiring willpower. Sure enough, the delicious shakes seemed to strengthen willpower by helping people perform better than expected on the next task. So far, so good. But the experiment also included a control group of people who were fed a tasteless concoction of low-fat dairy glop. It provided them with no pleasure, yet it produced similar improvements in self-control. The Mardi Gras theory looked wrong. Besides tragically removing an excuse for romping down the streets of New Orleans, the result was embarrassing for the researchers. Matthew Gailliot, the graduate student who ran the study, stood looking down at his shoes as he told Baumeister about the fiasco.

Baumeister tried to be optimistic. Maybe the study wasn't a failure. Something had happened, after all. Even the tasteless glop had done the job, but how? If it wasn't the pleasure, could it be the calories? At first the idea seemed a bit daft. For decades,

psychologists had been studying performance on mental tasks without worrying much about the results being affected by dairy-product consumption. They liked to envision the human mind as a computer, focusing on the way it processed information. In their eagerness to chart the human equivalent of the computer's chips and circuits, most psychologists neglected one mundane but essential part of the machine: the power supply. The brain, like the rest of the body, derived energy from glucose, the simple sugar manufactured from all kinds of foods. To establish cause and effect, researchers at Baumeister's lab tried refueling the brain in a series of experiments involving lemonade mixed either with sugar or with a diet sweetener. The sugary lemonade provided a burst of glucose, the effects of which could be observed right away in the lab; the sugarless variety tasted quite similar without providing the same burst of glucose. Again and again, the sugar restored willpower, but the artificial sweetener had no effect. The glucose would at least mitigate the ego depletion and sometimes completely reverse it. The restored willpower improved people's self-control as well as the quality of their decisions: they resisted irrational bias when making choices, and when asked to make financial decisions, they were more likely to choose the better long-term strategy instead of going for a quick payoff. The ego-depletion effect was even demonstrated with dogs in two studies by Holly Miller and Nathan DeWall at the University of Kentucky. After obeying sit and stay commands for 10 minutes, the dogs performed worse on self-control tests and were also more likely to make the dangerous decision to challenge another dog's turf. But a dose of glucose restored their willpower.

Despite this series of findings, brain researchers still had some reservations about the glucose connection. Skeptics pointed out that the brain's overall use of energy remains about the same regardless of what a person is doing, which doesn't square easily with the notion of depleted energy affecting willpower. Among the skeptics was Todd Heatherton, who worked with Baumeister early in his career and eventually wound up at Dartmouth, where he became a pioneer of what is called social neuroscience: the study of links between brain processes and social behavior. He believed in ego depletion, but he didn't see how this neural process could be caused simply by variations in glucose levels. To observe the process — and to see if it could be reversed by glucose — he and his colleagues recruited 45 female dieters and recorded images of their brains as they reacted to pictures of food. Next the dieters watched a comedy video while forcing themselves to suppress their laughter — a standard if cruel way to drain mental energy and induce ego depletion. Then they were again shown pictures of food, and the new round of brain scans revealed the effects of ego depletion: more activity in the nucleus accumbens, the brain's reward center, and a corresponding decrease in the amygdala, which ordinarily helps control impulses. The food's appeal registered more strongly while impulse control weakened — not a good

combination for anyone on a diet. But suppose people in this ego-depleted state got a quick dose of glucose? What would a scan of their brains reveal?

The results of the experiment were announced in January, during Heatherton's speech accepting the leadership of the Society for Personality and Social Psychology, the world's largest group of social psychologists. In his presidential address at the annual meeting in San Antonio, Heatherton reported that administering glucose completely reversed the brain changes wrought by depletion — a finding, he said, that thoroughly surprised him. Heatherton's results did much more than provide additional confirmation that glucose is a vital part of willpower; they helped solve the puzzle over how glucose could work without global changes in the brain's total energy use. Apparently ego depletion causes activity to rise in some parts of the brain and to decline in others. Your brain does not stop working when glucose is low. It stops doing some things and starts doing others. It responds more strongly to immediate rewards and pays less attention to long-term prospects.

The discoveries about glucose help explain why dieting is a uniquely difficult test of self-control — and why even people with phenomenally strong willpower in the rest of their lives can have such a hard time losing weight. They start out the day with virtuous intentions, resisting croissants at breakfast and dessert at lunch, but each act of resistance further lowers their willpower. As their willpower weakens late in the day, they need to replenish it. But to resupply that energy, they need to give the body glucose. They're trapped in a nutritional catch-22:

1. In order not to eat, a dieter needs willpower.

2. In order to have willpower, a dieter needs to eat.

As the body uses up glucose, it looks for a quick way to replenish the fuel, leading to a craving for sugar. After performing a lab task requiring self-control, people tend to eat more candy but not other kinds of snacks, like salty, fatty potato chips. The mere expectation of having to exert self-control makes people hunger for sweets. A similar effect helps explain why many women yearn for chocolate and other sugary treats just before menstruation: their bodies are seeking a quick replacement as glucose levels fluctuate. A sugar-filled snack or drink will provide a quick improvement in self-control (that's why it's convenient to use in experiments), but it's just a temporary solution. The problem is that what we identify as sugar doesn't help as much over the course of the day as the steadier supply of glucose we would get from eating proteins and other more nutritious foods.

The benefits of glucose were unmistakable in the study of the Israeli parole board. In midmorning, usually a little before 10:30, the parole board would take a break, and the judges would be served a sandwich and a piece of fruit. The prisoners who appeared just before the break had only about a 20 percent chance of getting parole, but the ones appearing right after had around a 65 percent chance. The odds dropped again as the morning wore on, and prisoners really didn't want to appear just before lunch: the chance of getting parole at that time was only 10 percent. After lunch it soared up to 60 percent, but only briefly. Remember that Jewish Israeli prisoner who appeared at 3:10 p.m. and was denied parole from his sentence for assault? He had the misfortune of being the sixth case heard after lunch. But another Jewish Israeli prisoner serving the same sentence for the same crime was lucky enough to appear at 1:27 p.m., the first case after lunch, and he was rewarded with parole. It must have seemed to him like a fine example of the justice system at work, but it probably had more to do with the judge's glucose levels.

It's simple enough to imagine reforms for the parole board in Israel — like, say, restricting each judge's shift to half a day, preferably in the morning, interspersed with frequent breaks for food and rest. But it's not so obvious what to do with the decision fatigue affecting the rest of society. Even if we could all afford to work half-days, we would still end up depleting our willpower all day long, as Baumeister and his colleagues found when they went into the field in Würzburg in central Germany. The psychologists gave preprogrammed BlackBerrys to more than 200 people going about their daily routines for a week. The phones went off at random intervals, prompting the people to report whether they were currently experiencing some sort of desire or had recently felt a desire. The painstaking study, led by Wilhelm Hofmann, then at the University of Würzburg, collected more than 10,000 momentary reports from morning until midnight.

Desire turned out to be the norm, not the exception. Half the people were feeling some desire when their phones went off — to snack, to goof off, to express their true feelings to their bosses — and another quarter said they had felt a desire in the past half-hour. Many of these desires were ones that the men and women were trying to resist, and the more willpower people expended, the more likely they became to yield to the next temptation that came along. When faced with a new desire that produced some I-want-to-but-I-really-shouldn't sort of inner conflict, they gave in more readily if they had already fended off earlier temptations, particularly if the new temptation came soon after a previously reported one.

The results suggested that people spend between three and four hours a day resisting desire.

Put another way, if you tapped four or five people at any random moment of the day, one of them would be using willpower to resist a desire. The most commonly resisted desires in the phone study were the urges to eat and sleep, followed by the urge for leisure, like taking a break from work by doing a puzzle or playing a game instead of writing a memo. Sexual urges were next on the list of most-resisted desires, a little ahead of urges for other kinds of interactions, like checking Facebook. To ward off temptation, people reported using various strategies. The most popular was to look for a distraction or to undertake a new activity, although sometimes they tried suppressing it directly or simply toughing their way through it. Their success was decidedly mixed. They were pretty good at avoiding sleep, sex and the urge to spend money, but not so good at resisting the lure of television or the Web or the general temptation to relax instead of work.

We have no way of knowing how much our ancestors exercised self-control in the days before BlackBerrys and social psychologists, but it seems likely that many of them were under less ego-depleting strain. When there were fewer decisions, there was less decision fatigue. Today we feel overwhelmed because there are so many choices. Your body may have dutifully reported to work on time, but your mind can escape at any instant. A typical computer user looks at more than three dozen Web sites a day and gets fatigued by the continual decision making — whether to keep working on a project, check out TMZ, follow a link to YouTube or buy something on Amazon. You can do enough damage in a 10-minute online shopping spree to wreck your budget for the rest of the year.

The cumulative effect of these temptations and decisions isn't intuitively obvious. Virtually no one has a gut-level sense of just how tiring it is to decide. Big decisions, small decisions, they all add up. Choosing what to have for breakfast, where to go on vacation, whom to hire, how much to spend — these all deplete willpower, and there's no telltale symptom of when that willpower is low. It's not like getting winded or hitting the wall during a marathon. Ego depletion manifests itself not as one feeling but rather as a propensity to experience everything more intensely. When the brain's regulatory powers weaken, frustrations seem more irritating than usual. Impulses to eat, drink, spend and say stupid things feel more powerful (and alcohol causes self-control to decline further). Like those dogs in the experiment, ego-depleted humans become more likely to get into needless fights over turf. In making decisions, they take illogical shortcuts and tend to favor short-term gains and delayed costs. Like the depleted parole judges, they become inclined to take the safer, easier option even when that option hurts someone else.

"Good decision making is not a trait of the person, in the sense that it's always there,"

Baumeister says. “It’s a state that fluctuates.” His studies show that people with the best self-control are the ones who structure their lives so as to conserve willpower. They don’t schedule endless back-to-back meetings. They avoid temptations like all-you-can-eat buffets, and they establish habits that eliminate the mental effort of making choices. Instead of deciding every morning whether or not to force themselves to exercise, they set up regular appointments to work out with a friend. Instead of counting on willpower to remain robust all day, they conserve it so that it’s available for emergencies and important decisions.

“Even the wisest people won’t make good choices when they’re not rested and their glucose is low,” Baumeister points out. That’s why the truly wise don’t restructure the company at 4 p.m. They don’t make major commitments during the cocktail hour. And if a decision must be made late in the day, they know not to do it on an empty stomach. “The best decision makers,” Baumeister says, “are the ones who know when *not* to trust themselves.”

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