

Control Yourself!

Cocktail or cola? Banana or banana split? Understanding how we handle such decisions makes it easier to keep our cravings in check

By *Wilhelm Hofmann and Malte Frieese*

Most of us start out with the best of intentions. Then we walk right past the fruit bowl in search of the devil's food cake. Or drink one glass of wine too many. Or, after yet another glass, kiss that coworker at the holiday party. Unfortunately, life constantly presents us with situations that pit our well-reasoned resolutions against the promise of immediate pleasure. As screen legend Mae West once purred, "I generally avoid temptation unless I can't resist it." Withstanding temptation takes self-discipline—no easy trick when immediate gratification plumps our sense of well-being. But it is well worth the effort. Self-control saves us and other people from embarrassing or, worse, damaging consequences.

So why do we so often succumb to the siren song and act against our own self-interests? Scientists have tried for decades to understand this all too human conundrum. Sigmund Freud, the founder of psychoanalysis, viewed all behavior as fallout from conflicts among the id, the ego and the superego. In 1986 psychologist Icek Ajzen of the University of Massachusetts Amherst and economist Thomas J. Madden of the University of South

Carolina developed a well-known explanation—the theory of planned behavior—in which all our actions derive from our intentions alone. More recently, though, researchers have turned to models that explain self-control—or a lack thereof—as the outcome of a battle between two emotional systems: our impulses and our powers of reflection.

These dual-system models, particularly one developed in 2004 by psychologists Fritz

AGE FOTOSTOCK

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Strack and Roland Deutsch of the University of Würzburg in Germany, are fairly straightforward: our impulsive self makes fast associations—vending machine equals chocolate. It scans the environment for potentially pleasurable stimuli and sets habitual actions in motion. The strength of these urges varies from one individual to another and from one situation to the next. Personality (are you a risk taker?), current needs (are you hungry?) and prior experiences (did your parents give you chocolate as a reward?) all influence the strength of the impulse. Reflective thought, on the other hand, draws on reasoning and planning; it comes into play whenever someone sets a long-term goal, such as losing weight. Compared with impulses, reflection is resource-intensive, demanding time and memory, but it affords us a good measure of control over our actions.

Because our impulses and our reflections engage different information-processing pathways, dual-system models neatly explain why we are very much of two minds when it comes to temptation. The classic image of an angel on one shoulder and a devil on the other fits well with what researchers have learned: the two systems compete for control over our response to some want; the winner is whichever one experiences greater activation under the circumstances. It is easier to ignore a weak impulse than a strong one (try food shopping on an empty stomach). At the same time, it is easier to engage the reflective system if it clearly recognizes undesirable behavior. Its potency depends on how strongly a

Explanation in Brief

Self-control is the exertion of willpower in the interest of long-term objectives.

Ego depletion: Activities that require mastery or otherwise tax our self-control render us less able to resist temptation in subsequent activities, even if the two tasks are unrelated.

person identifies with his or her long-term goals and how firmly those goals are held in working memory, among other factors.

Just Say No

Indeed, a range of influences can help or hinder self-control. In the 1970s psychologist Walter Mischel and his co-workers at Stanford University investigated under what circumstances elementary school pupils were able to resist a small but immediate reward—a piece of candy—in exchange for a larger one later. Among other things, they found that the children were better able to delay gratification—that is, put off the smaller reward and wait for something bigger—when the candy was hidden. Concealing the candy was enough to dampen the children's impulses. But self-control is not always so easy as out of sight, out of mind. More recent studies have demonstrated that mental strain, stress and the influence of alcohol can impair an adult's ability to bypass temptation.

Roy F. Baumeister and his colleagues at Florida State University did groundbreaking research in this area in the 1990s. They tested the idea that mental challenges sap the energy required to maintain self-control, much as physical challenges deplete muscle strength. They reasoned that any activity requiring a certain level of mastery would weaken an individual's self-control in subsequent tasks. Imagine, for example, that you have a job interview at 11 A.M. Naturally, you want to convey a positive image of yourself—an exercise that demands a fair amount of composure. According to Baumeister's theory, after the interview, you would be less able to resist the urge to have french fries at lunch; after a morning at home, though, you might easily forgo the fries and opt for a healthy salad.

In 1998 Baumeister and his associates performed an intriguing experiment in which they presented subjects with freshly baked chocolate-chip cookies—

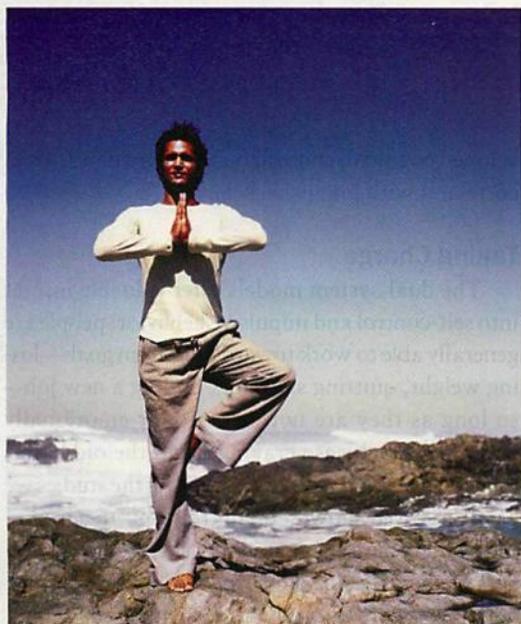
FAST FACTS

Impulses vs. Intentions

1 Two different information-processing systems in the brain battle for control of our response to temptation: impulses aimed at immediate gratification, and reason, which helps us pursue long-term objectives.

2 Stress, emotional strain, alcohol and other drains on cognitive resources, such as working memory, can render us less able to withstand temptation.

3 Fortunately, a number of training methods can bolster self-control. It is possible to strengthen our mental resources and turn our impulses for good.



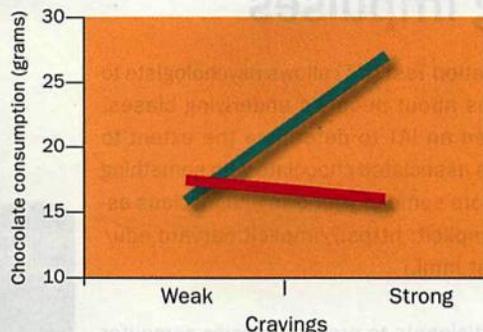
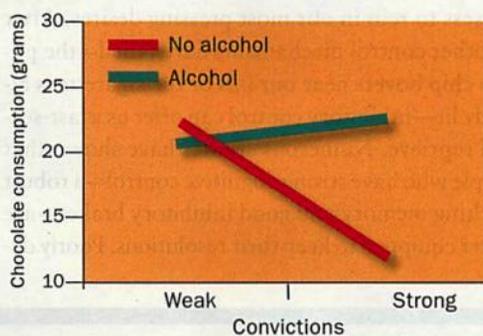
10 Tips to Increase Self-Control

- 1. Become aware of the risks** and long-term negative consequences of undesirable behavior.
- 2. Increase your personal engagement** by, for example, telling friends about your goals.
- 3. Transform abstract overarching objectives** into intermediate steps or milestones.
- 4. Take pleasure in achieving partial successes** and reaching intermediate milestones.
- 5. Formulate "if then" resolutions** to deal with critical situations.
- 6. Replace old bad habits** with new good ones.
- 7. Change your impulses** by learning to associate the mere sight of temptations with negative stimuli.
- 8. Identify situations** that pose a particular risk and avoid them as much as possible.
- 9. Train your working memory.**
- 10. Plan enough breaks** and relaxation periods to prevent depletion of your mental resources.

ostensibly as part of a taste test. They allowed only some participants to try the cookies; others were given radishes. In a later session they asked the subjects to try to solve what were actually insoluble problems. It turned out that individuals who had been forced to withstand the cookie temptation gave up on the problems more readily—on average after only eight minutes. In contrast, those permitted to stuff their face with cookies held out for almost 19 minutes. A control group, made up of subjects who received neither cookies nor radishes, worked for more than 20 minutes before quitting the problems.

Researchers have dubbed this phenomenon, in which external circumstances alter our capacity for self-control, short-term ego depletion. Following the lead of Baumeister and others, we hypothesize that impulses hold greater sway over our behavior when our powers of reflection have fewer resources to draw on. Using a variety of scenarios, we have explored how our ability to act in accordance with long-term goals depends on whether we possess the mental reserves needed to meet them. For instance, we have found that people are often unsuccessful at turning down chocolate—even if they are trying to diet or believe sweets are unhealthy—when they are under the influence of alcohol.

In this experiment, half the participants drank 0.3 liter of vodka and orange juice some 15 minutes before the test; the other half received unadulterated orange juice. We gave all the subjects questionnaires to learn about their consciously held attitudes toward sweets. We also administered the Implicit Association Test (IAT), developed by Anthony



In their experiment, the authors were able to predict the chocolate consumption of hungry test subjects based solely on their resolutions: those who did not want to eat very much, for instance, typically did not. After they drank alcohol, though, the strength of the participants' impulses became the dominant influence. Those who liked chocolate, regardless of their intentions, ate more than those who did not.

Greenwald and his co-workers at the University of Washington, to gauge the extent to which individual subjects associated chocolate with something pleasant—and so how strongly they might be tempt-

(The Authors)

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People who have a robust working memory and good inhibitory brakes are better at keeping their resolutions.

ed to eat it. We found that it was easy to predict how much a person would eat based solely on their attitudes, provided they had not consumed alcohol. No matter how much the chocolate tempted them, the sober subjects were typically able to stick to their convictions. Among tipsy subjects, however, the more they liked chocolate, the more they ate [see illustration on preceding page].

Of course, short-term ego depletion is not the whole story. Drunk or sober, some people seem remarkably disciplined, whereas others have never met a temptation they didn't like. Various cognitive functions probably account for such differences. Working memory—which seems to govern whether we are able to focus our attention on some aim—most likely plays a role. Far more important may be inhibitory control—that is, the mental brakes we possess to rein in our most pressing desires. After all other control mechanisms have failed—the potato chip hovers near our lips or the cigarette is already lit—inhibitory control can offer us a last-second reprieve. Numerous studies have shown that people who have strong cognitive control—a robust working memory and good inhibitory brakes—are better equipped to keep their resolutions. Poorly de-

veloped cognitive control, on the other hand, often correlates with impulsive behavior.

Taking Charge

The dual-system models offer valuable insight into self-control and impulsive behavior: people are generally able to work toward long-term goals—losing weight, quitting smoking, finding a new job—so long as they are not mentally or emotionally taxed, in which case cravings, and the old habits that go with them, grab the wheel. As the studies we have discussed show, self-control can run aground for a variety of reasons, among them a lack of awareness or the presence of overpowering urges. Alternatively, a person might face tremendous strain, which chips away at otherwise intact inhibitory brakes; other individuals might simply lack the cognitive control needed to stop them from acting on impulse. In the final analysis, self-control always depends on the interplay of all these factors and possibly others as well.

Fortunately, there are effective methods to bolster self-control [see box on preceding page]. Traditional approaches generally attempt to strengthen a person's resolve by equipping them with knowledge,

Measuring Impulses

An Implicit Association Test (IAT) allows psychologists to draw conclusions about people's underlying biases. The authors used an IAT to determine the extent to which their test subjects associated chocolate with something pleasant. (You can explore some of your own unconscious associations at Project Implicit: <https://implicit.harvard.edu/implicit/demo/takeatest.html>.)

Round 1: We asked participants to press a specific computer key on the left side of the keyboard when they saw images of either chocolate or pleasant objects.

Round 2: Next, we had them press a computer key on the right side of the keyboard when they saw images of either chocolate or unpleasant objects.

We concluded that individuals who, on average, pressed the key in round 1 faster than they did in round 2 had a positive emotional reaction to chocolate; those who pressed the key faster in round 2 were deemed to have a negative emotional response to chocolate.



GETTY IMAGES

Keeping Resolutions



StickK.com—founded by Dean Karlan, an economics professor at Yale University, Ian Ayres, a law professor at Yale, and Jordan Goldberg, a student at the Yale School of Management—helps people to achieve long-term goals of all kinds. Individuals who want to change a particular behavior join at no cost and set a goal (such as losing 10 pounds or quitting smoking). Next, they establish a desired time frame and specific milestones, along with a monetary wager that goes to charity or a friend—or even an enemy—in case they fail to meet their goal. They also appoint a judge to decide whether the milestones and mission are accomplished and to report back to the Web site or to family members and friends via e-mail. As of January 2011, StickK users had made some 60,000 so-called commitment contracts, worth nearly \$6 million in bets. The site calculated that these resolutions led to more than a million cigarettes not smoked and nearly 150,000 workouts completed.

www.stickK.com

which stands to reason if they fail to see the consequences of their behavior: “You must not smoke, because it will harm you.” Such tactics do not help, though, if the person understands the risks and is nonetheless not motivated—or has no plan—to act otherwise. In these cases, it is often useful to have them formulate small intermediate steps toward their long-term objective, thereby building up so-called implementation intentions. These mini milestones are concrete “if then” resolutions that link critical situations to some desired behavior: “If I am offered a cigarette, I will politely say no.” Many studies have demonstrated the efficacy of implementation intentions, which have been developed by Peter Gollwitzer of the University of Constance in Germany.

Yet another approach aims to train the impulsive system so that it no longer handicaps our pursuit of long-term objectives and may even help. Practitioners repeat neutral or good habits until they eventually replace more deleterious ones—for example, ordering nonalcoholic beer at a restaurant instead of spirits. Such training programs can cause real stress at first, but consistent repetition usually leads to a tipping point, after which the impulsive system automatically triggers the desired response. Dutch psychologist Reinout Wiers and his colleagues at the University of Amsterdam have found that even simple exercises can serve to retrain our impulses. The researchers asked alcohol-dependent patients to repeatedly move a joystick in a certain direction to signal rejection whenever they saw a photograph of alcohol on a computer screen. When they tested the program at a substance abuse clinic, the results were promising: one year after discharge the recidivism rate among patients drilled on the

computer was lower than that among those who received only standard treatment.

Still other strategies target working memory in an attempt to fortify weak cognitive control. Torkel Klingenberg and his team at the Karolinska Institute in Stockholm have tested this idea in children and the elderly, but such a program might also aid in adults lacking self-discipline. The surest ploy may simply be avoiding temptation wherever possible. You are unlikely to wrestle with self-control if you steer clear of potentially compromising circumstances in the first place.

But of course, that is not always possible. So the next time you face the choice between short-term gratification and a long-term goal, think about the battle going on in your brain between impulses and reflective thoughts. It might just help you to muzzle your cravings. **M**

(Further Reading)

- ◆ **Implementation Intentions: Strong Effects of Simple Plans.** Peter M. Gollwitzer in *American Psychologist*, Vol. 54, No. 7, pages 493–503; 1999.
- ◆ **Increased Prefrontal and Parietal Brain Activity after Training of Working Memory.** Pernille J. Olesen et al. in *Nature Neuroscience*, Vol. 7, No. 1, pages 75–79; 2004.
- ◆ **Reflective and Impulsive Determinants of Social Behavior.** Fritz Strack and Roland Deutsch in *Personality and Social Psychology Review*, Vol. 8, pages 220–247; 2004.
- ◆ **The Strength Model of Self-Control.** Roy F. Baumeister et al. in *Current Directions in Psychological Science*, Vol. 16, No. 6, pages 396–403; 2007.
- ◆ **Impulse and Self-Control from a Dual-Systems Perspective.** Wilhelm Hofmann et al. in *Perspectives on Psychological Science*, Vol. 4, No. 2, pages 162–176; 2009.
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Why Johnny Can't Name His Colors

The way we commonly use color and number words in English makes it unnecessarily difficult for kids to learn the concepts

By Melody Dye

Subject 046M, two years old, was seated nervously across from me at the table, his hands clasped tightly together in his lap. He appeared to have caught an incurable case of the squirms. I resisted the urge to laugh and leaned forward, whispering conspiratorially. "Today we're going to play a game with Mr. Moo." I produced an inviting plush cow from behind my back. "Can you say hi to Mr. Moo?"

At the Stanford University lab in which I work with cognitive scientist Michael Ramscar, we study how children go about what is arguably the most vital project in their schooling—learning language. Over the past several years we have been particularly taken with the question of how kids learn a small but telling piece of that vast complex: color words. We want to know how much they know, when they know it and whether we can help them get there faster.

046M ("M" for male) was off to a good start. I arranged three color swatches in front of him. "Can you show me the red one?" He paused, then pointed to the middle rectangle. "Very good!" I said, beaming. "Now, what about the one that's blue?"

(The Author)

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The test was not designed to trip kids up. Far from it—we tested only basic color words, and we never made them pick between confusable shades, such as red and pink. To an adult, the test would be laughably easy. Yet after several months of testing two-year-old children, I could count my high scorers on one hand. Most would fail the test outright. 046M, despite his promising start, proved no exception.

There is a surprising disconnect between what children seem to know about colors and numbers and what they actually know when tested. Nailing down just what "red" or "three" means is a difficult hurdle in mastering language, and even older children sometimes slip up and reveal a less than expert grasp of the concept. We dis-

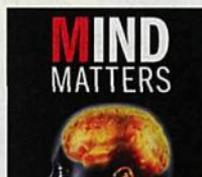
covered in our lab that the way we use color and number words in everyday English actually impedes kids' learning.

Parents see their children's color and number knowledge as developmental milestones for good reason—once these concepts are mastered, a whole world of nuanced comprehension opens up for their kids. Our research reveals that if

we understand how the developing brain makes sense of speech, we can help children reach these milestones more painlessly. By phrasing things slightly differently, adults can help youngsters to grasp colors and numbers—and therefore advance to a higher understanding of language—much earlier in life.

Red Apples, Blue Skies

Before our testing begins, a research assistant will explain to the child's parents that we will be testing color words. Responses are typically enthusiastic. "Oh, that's great! Margie's got her colors down pat." At that point we level with them: if they want to be present during the study, they will have to be blindfolded. Such measures may seem extreme—but then again, so were the reactions we



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