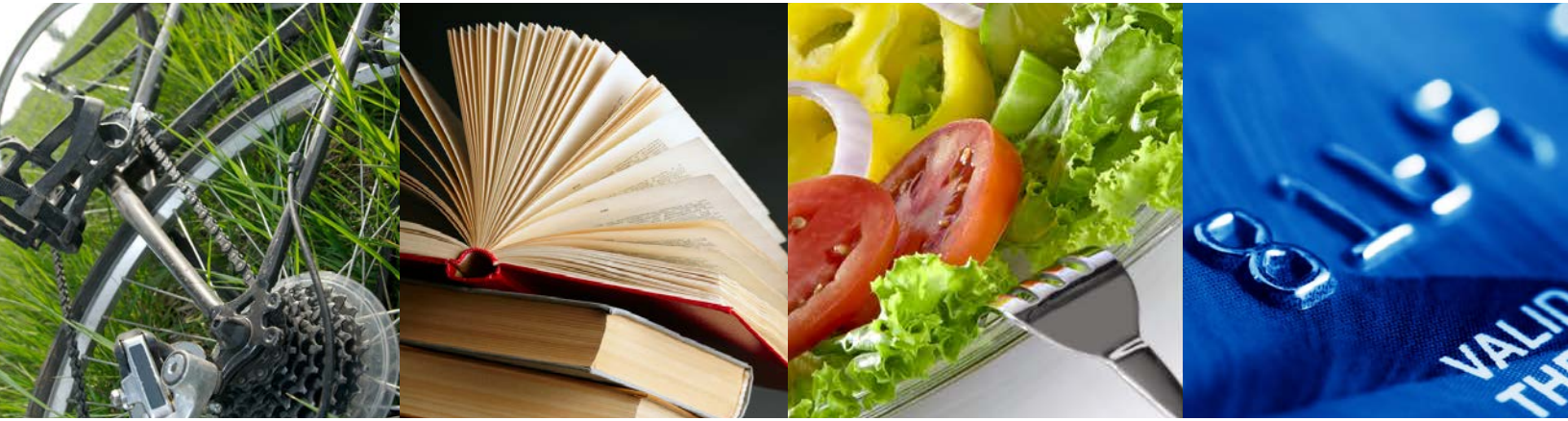




AMERICAN PSYCHOLOGICAL ASSOCIATION



WHAT YOU NEED TO KNOW ABOUT
Willpower

The Psychological Science of Self-Control





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Willpower: An Introduction

Many people believe they could improve their lives if only they had more of that elusive quality known as willpower. With more self-control, we would all eat right, exercise regularly, avoid drugs and alcohol, save for retirement, stop procrastinating and achieve all sorts of noble goals.

Take, for example, the results of the American Psychological Association's annual *Stress in America*™ survey. The survey asks, among other things, about participants' abilities to make healthy lifestyle changes. Survey participants regularly cite lack of willpower as the No. 1 reason for not following through with such changes.

In 2011, 27 percent of survey respondents reported that lack of willpower was the most significant barrier to change. Yet although many people blame imperfect willpower for their imperfect choices, it's clear they haven't given up hope. A majority of respondents believe that willpower is something that can be learned.

Those respondents are onto something. Recent research suggests some ways in which willpower can, in fact, be strengthened with practice. Similarly, many survey participants reported that having more time for themselves would help them overcome their lack of willpower. However, willpower doesn't automatically flourish when you have extra time on your hands.

So, how can you resist when faced with temptation? In recent years, scientists have made some compelling discoveries about the ways that willpower works. This brief explores our current understanding of self-control.

WHAT WE KNOW NOW

Lack of willpower isn't the only reason a person might fail to reach their goals. Willpower researcher Roy Baumeister, PhD, a psychologist at Florida State University, describes three necessary components for achieving objectives:

- 1) Establishing the motivation for change and setting a clear goal.
- 2) Monitoring the behavior toward that goal.
- 3) Exercising willpower. Whether your goal is to lose weight, kick a smoking habit, study more or spend less time on Facebook, willpower is a critical step to achieving that outcome.

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Willpower is the ability to resist short-term temptations in order to meet long-term goals.

At its essence, willpower is the ability to resist short-term temptations in order to meet long-term goals, and there are good reasons to do so. University of Pennsylvania psychologists Angela Duckworth, PhD, and Martin Seligman, PhD, explored self-control in eighth graders over the course of a school year. The researchers first gauged the students' self-discipline (their term for self-control) by having teachers, parents and the students complete questionnaires. They also gave students a task in which they had the option of receiving \$1 immediately or waiting a week to receive \$2. They found students who ranked high on self-discipline had better grades, better school attendance and higher standardized-test scores, and were more likely to be admitted to a competitive high school program. Self-discipline, the researchers found, was more important than IQ in predicting academic success.

FURTHER READING

Baumeister, R., & Tierney, J. (2011). *Willpower: Rediscovering the Greatest Human Strength*. New York: Penguin Press.

Duckworth, A. (2011). The significance of self-control. *Proceedings of the National Academy of Sciences*, 108(7), 2639–2640.

Duckworth, A., & Seligman, M. (2005). Self-discipline outdoes IQ in predicting academic performance in adolescents. *Psychological Science*, 16(12), 939–944.

Moffitt, T., et al. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of Sciences*, 108, 2693–2698.

Tangney, J., Baumeister, R., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, 72(2), 271–324.

Other studies have uncovered similar patterns. June Tangney, PhD, of George Mason University, and colleagues compared willpower by asking undergraduate students to complete questionnaires designed to measure their self-control. The scientists also created a scale to score each student's relative willpower strength. They found the self-control scores correlated with higher grade point averages, higher self-esteem, less binge eating and alcohol abuse, and better relationship skills.

The benefits of willpower seem to extend well beyond the college years. Terrie Moffitt, PhD, of Duke University, and colleagues studied self-control in a group of 1,000 individuals who were tracked from ages birth to 32 as part of a long-term health study in Dunedin, New Zealand. She and her colleagues found that individuals with high self-control in childhood (as reported by teachers, parents and the children themselves) grew into adults with greater physical and mental health, fewer substance abuse problems and criminal convictions, and better savings behavior and greater financial security. Those patterns held even after the researchers controlled for the children's socioeconomic status, home lives and general intelligence.

Such findings underscore the importance of willpower in nearly all areas of life.

Delaying Gratification

More than 40 years ago, Walter Mischel, PhD, a psychologist now at Columbia University, explored self-control in children with a simple but effective test. His experiments using the “marshmallow test,” as it came to be known, laid the groundwork for the modern study of self-control.

Mischel and his colleagues presented a preschooler with a plate of treats such as marshmallows. The child was then told that the researcher had to leave the room for a few minutes, but not before giving the child a simple choice: If the child waited until the researcher returned, she could have two marshmallows. If the child simply couldn’t wait, she could ring a bell and the researcher would come back immediately, but she would only be allowed one marshmallow.

In children, as well as adults, willpower can be thought of as a basic ability to delay gratification. Preschoolers with good self-control sacrifice the immediate pleasure of a chewy marshmallow in order to indulge in two marshmallows at some later point. Ex-smokers forfeit the enjoyment of a cigarette in order to experience good health and avoid an increased risk of lung cancer in the future. Shoppers resist splurging at the mall so they can save for a comfortable retirement. And so on.

The marshmallow experiments eventually led Mischel and his colleagues to develop a framework to explain the human ability to delay gratification. He proposed what he calls a “hot-and-cool” system to explain why willpower succeeds or fails.

The cool system is cognitive in nature. It’s essentially a thinking system, incorporating knowledge about sensations, feelings, actions and goals — reminding yourself, for instance, why you shouldn’t eat the marshmallow. While the cool system is reflective, the hot system is impulsive and emotional. The hot system is responsible for quick, reflexive responses to certain triggers — such as popping the marshmallow into your mouth without considering the long-term implications. If this framework were a cartoon, the cool system would be the angel on your shoulder and the hot system, the devil.

When willpower fails, exposure to a “hot” stimulus essentially overrides the cool system, leading to impulsive actions. Some people, it seems, may be more or

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When presented with tempting stimuli, individuals with low self-control showed brain patterns that differed from those with high self-control.

FURTHER READING

Casey, B. J., et al. (2011). Behavioral and neural correlates of delay of gratification 40 years later. *Proceedings of the National Academy of Sciences, 108*(36), 14998–15003.

Metcalf, J., & Mischel, W. (1999). A hot/cool system analysis of delay of gratification: Dynamics of willpower. *Psychological Review, 106*(1), 3–19.

Mischel, W., et al. (1989). Delay of gratification in children. *Science, 244*(4907), 933–938.

Mischel, W., & Ayduk, O. (2004). Willpower in a cognitive-affective processing system: The dynamics of delay of gratification. In R. F. Baumeister & K. D. Vohs (Eds.), *Handbook of Self-Regulation: Research, Theory, and Applications*. New York, NY: Guilford Press.

Nordgren, L., & Chou, E. (2011). The push and pull of temptation: The bidirectional influence of temptation on self-control. *Psychological Science, 22*(11), 1386–1390.

less susceptible to hot triggers. And that susceptibility to emotional responses may influence their behavior throughout life, as Mischel discovered when he revisited his marshmallow-test subjects as adolescents. He found that teenagers who had waited longer for the marshmallows as preschoolers were more likely to score higher on the SAT, and their parents were more likely to rate them as having a greater ability to plan, handle stress, respond to reason, exhibit self-control in frustrating situations and concentrate without becoming distracted.

As it turns out, the marshmallow study didn't end there. Recently, B.J. Casey, PhD, of Weill Cornell Medical College, along with Mischel, Yuichi Shoda, PhD, of the University of Washington, and other colleagues tracked down 59 subjects, now in their 40s, who had participated in the marshmallow experiments as children. The researchers tested the subjects' willpower strength with a laboratory task known to demonstrate self-control in adults.

Amazingly, the subjects' willpower differences had largely held up over four decades. In general, children who were less successful at resisting the marshmallow all those years ago performed more poorly on the self-control task as adults. An individual's sensitivity to so-called hot stimuli, it seems, may persist throughout his or her lifetime.

Additionally, Casey and colleagues examined brain activity in some subjects using functional magnetic resonance imaging. When presented with tempting stimuli, individuals with low self-control showed brain patterns that differed from those with high self-control. The researchers found that the prefrontal cortex (a region that controls executive functions, such as making choices) was more active in subjects with higher self-control. And the ventral striatum (a region thought to process desires and rewards) showed boosted activity in those with lower self-control.

Research has yet to fully explain why some people are more sensitive to emotional triggers and temptations, and whether these patterns might be corrected. However, the recent findings offer an intriguing neurobiological basis for the push and pull of temptation.

Is Willpower a Limited Resource?

Although Mischel's hot-cool framework may explain our ability to delay gratification, another theory known as willpower depletion has emerged to explain what happens after we've resisted temptation after temptation.

Every day, in one form or another, you exert willpower. You resist the urge to surf the Web instead of finishing your expense report. You reach for a salad when you're craving a burger. You bite your tongue when you'd like to make a snide remark. Yet a growing body of research shows that resisting repeated temptations takes a mental toll. Some experts liken willpower to a muscle that can get fatigued from overuse.

Some of the earliest evidence of this effect came from the lab of Roy Baumeister. In one early study, he brought subjects into a room filled with the aroma of fresh-baked cookies. The table before them held a plate of the cookies and a bowl of radishes. Some subjects were asked to sample the cookies, while others were asked to eat the radishes. Afterward, they were given 30 minutes to complete a difficult geometric puzzle. Baumeister and his colleagues found that people who ate radishes (and resisted the enticing cookies) gave up on the puzzle after about 8 minutes, while the lucky cookie-eaters persevered for nearly 19 minutes, on average. Drawing on willpower to resist the cookies, it seemed, drained the subjects' self-control for subsequent situations.

Since that work was published in 1998, numerous studies have built a case for willpower depletion, or ego depletion, as some experts call it. In one example, volunteers who were asked to suppress their feelings as they viewed an emotional movie gave up sooner on a test of physical stamina than did volunteers who watched the film and reacted normally. In another, people who actively suppressed certain thoughts were less able to stifle their laughter in a follow-up test designed to make them giggle.

Unfortunately, depleting events are all too common. If you've ever willed yourself to be diplomatic with an infuriating colleague or forced a smile through your in-laws' extended visit, you've probably discovered that social interactions often demand self-control. Indeed, research shows that interacting with others and maintaining relationships can deplete willpower. In one demonstration of that effect, Kathleen Vohs, PhD, of the University of Minnesota, and her

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FURTHER READING

Baumeister, et al. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology*, 74(5), 1252–1265.

Baumeister, et al. (2007). The strength model of self-control. *Current Directions in Psychological Science*, 16, 351–355.

Gailliot, M., et al. (2007). Self-control relies on glucose as a limited energy source: Willpower is more than a metaphor. *Journal of Personality and Social Psychology*, 92(2), 325–336.

Inzlicht, M., & Gutsell, J. (2007). Running on empty: Neural signals for self-control failure. *Psychological Science*, 18(11), 933–937.

Job, V., et al. (2010). Ego depletion — Is it all in your head? Implicit theories about willpower affect self-regulation. *Psychological Science*, 21(11), 1686–1693.

Martijn, C., et al. (2002). Getting a grip on ourselves: Challenging expectancies about loss of energy after self-control. *Social Cognition*, 20(6), 441–460.

Muraven, M., & Baumeister, R. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin*, 126(2), 247–259.

colleagues found that people who were asked to convince a hostile audience that they were likable suffered more willpower depletion than people who were asked to act naturally before the audience.

Dealing with a hostile audience (or your in-laws) may feel exhausting, but depletion is not simply a matter of being tired, as Vohs demonstrated. She subjected half of her study subjects to 24 hours of sleep deprivation before asking them to suppress their emotional reactions to a film clip. Then she tested the subjects' self-control strength. To her surprise, she found that the subjects who'd been up all night were no more likely to become willpower-depleted than those who'd spent the night snug in their beds.

So if depletion isn't physical fatigue, what is it? Recent investigations have found a number of possible mechanisms for willpower depletion, including some at a biological level. Scientists at the University of Toronto found that people whose willpower was depleted by self-control tasks showed decreased activity in the anterior cingulate cortex, a brain region involved with cognition. When your willpower has been tested, your brain may actually function differently.

Other evidence suggests that willpower-depleted individuals might be low on fuel. The brain is a high-energy organ, powered by a steady supply of glucose (blood sugar). Some researchers have proposed that brain cells working hard to maintain self-control consume glucose faster than it can be replenished. In a study lending support to this idea, obedient dogs made to resist temptation had lower blood-glucose levels than dogs that did not exert self-control.

Studies in humans have found similar patterns. Human subjects who exerted willpower in lab tasks had lower glucose levels than control subjects who weren't asked to draw on their self-control. Furthermore, restoring glucose appears to help reboot run-down willpower. One study, for example, found that drinking sugar-sweetened lemonade restored willpower strength in depleted individuals, while drinking sugar-free lemonade did not.

Yet evidence also suggests that willpower depletion can be kept in check by beliefs and attitudes. Mark Muraven, PhD, of the University at Albany, and colleagues found that people who felt compelled to exert self-control (in order to please others, for example) were more easily depleted than people who were

driven by their own internal goals and desires. When it comes to willpower, those who are in touch with themselves may be better off than their people-pleasing counterparts.

Muraven, Baumeister and their colleagues also explored the effects of mood. By lifting their subjects' spirits with comedy videos and surprise gifts, they demonstrated that a good mood can overcome some of the willpower-depletion effects normally seen after exercising self-control.

Other research suggests that a person's basic beliefs about willpower may be important. A 2010 study by Stanford University researcher Veronika Job, PhD, and colleagues found that individuals who thought willpower was a limited resource were subject to having their willpower depleted. But people who did not believe willpower was easily exhaustible did not show signs of depletion after exerting self-control.

In a second component of that study, the researchers manipulated volunteers' beliefs about willpower by asking them to fill out subtly biased questionnaires. The volunteers who had been led to believe that willpower was a limited resource showed signs of ego depletion, while those who had been led to believe that willpower was not limited showed no signs of dwindling self-control.

So is willpower a limited resource? Proponents of this idea point to a large and robust body of supporting evidence that has accumulated over the last decade. They argue that factors such as mood and belief may only buffer the effects of willpower depletion in its earliest stages. Still, further research is needed to explore how beliefs, moods and attitudes might affect one's ability to resist temptation.

FURTHER READING

Muraven, M. (in press). Ego-depletion: Theory and evidence. In R. M. Ryan (Ed.), *Oxford Handbook of Motivation*. Oxford: Oxford University Press.

Muraven, M., et al. (2008). Helpful self-control: Autonomy support, vitality, and depletion. *Journal of Experimental Social Psychology*, 44(3), 573–585.

Tice, D., et al. (2007). Restoring the self: Positive affect helps improve self-regulation following ego depletion. *Journal of Experimental Social Psychology*, 43(3), 379–384.

Vohs, K., et al. (2011). Ego depletion is not just fatigue: Evidence from a total sleep deprivation experiment. *Social Psychological and Personality Science*, 18(2), 166–173.

Vohs, K., et al. (2005). Self-regulation and self-presentation: Regulatory resource depletion impairs impression management and effortful self-presentation depletes regulatory resources. *Journal of Personality and Social Psychology*, 88(4), 632–657.



Limited willpower is often cited as a primary roadblock to maintaining a healthy weight, and research supports this idea.

Willpower and Healthy Behaviors

Every day, you make decisions to resist impulses in the quest for a healthier, happier life. Whether it's turning down a second helping of mashed potatoes, dragging yourself to the gym, forgoing another round of cocktails or resisting the urge to skip the Monday-morning meeting, your will is tested on a near-constant basis.

Limited willpower is often cited as a primary roadblock to maintaining a healthy weight, and research supports this idea. A study by Eli Tsukayama at the University of Pennsylvania and colleagues found, for example, that children with better self-control were less likely to become overweight as they transitioned to adolescence, thanks to their ability to control impulses and delay gratification.

However, as described previously, resisting those impulses may diminish one's strength to withstand the next temptation. Todd Heatherton, PhD, of Dartmouth College, and Kathleen Vohs demonstrated this in a study in which they offered dieting students ice cream after they'd watched a sad film. Some of the subjects had watched normally, while others were instructed to stifle their emotional reactions, an effort that required willpower. The researchers found that subjects who tapped into their willpower to squelch their feelings ate considerably more ice cream than did those who were free to respond emotionally to the movie.

People often blame bad moods for so-called "emotional eating." But Heatherton and Vohs found that their subjects' emotional states didn't influence how much ice cream they ate. In other words, willpower depletion was more important than mood in determining why the subjects indulged.

The reasons that someone is dieting may also play a role. As the previous section described, Muraven and colleagues found that a person's beliefs and attitudes may buffer them from the effects of depletion. In one example of this idea, he asked volunteers to resist eating from a plate of cookies placed before them. Then he tested their self-control strength by having them squeeze an exercise handgrip for as long as they could. He found that the people who chose not to eat the cookies for internal reasons (such as enjoying the challenge of resisting the treats) showed better self-control in the handgrip test than did people who resisted for external reasons (such as wanting to please the experimenter).



It's clear that willpower is a necessary component of healthy eating. In an environment where unhealthy (and mouthwatering) food choices are everywhere, resisting temptation is likely to deplete willpower, chipping away at the resolve of even highly motivated dieters. Yet overeating behaviors are complex, with numerous psychological and neurological underpinnings. As a result, the role of willpower is somewhat contentious when discussing treatments for obesity.

Some experts believe that stressing self-control and personal choice stigmatizes people — and is unlikely to motivate them to lose weight. Health practitioners should avoid emphasizing willpower in this pursuit, such experts argue, and focus on minimizing the impact of the environment on eating behavior. After all, when it comes to our modern environment, resisting the urge to overeat can be an enormous challenge. We're bombarded with ads for high-calorie treats. Fast, cheap, processed food is readily available 24 hours a day, seven days a week — and often costs less than healthier options. Still, both willpower and the environment play a role in food-related choices. Better understanding of both elements will improve options for individuals and health practitioners wrestling with obesity.

Willpower plays a role in other healthy lifestyle choices as well, including the use and abuse of tobacco, alcohol and illicit drugs. Developing good self-control as children may prevent substance abuse problems in teenagers and adults, according to Kevin King, PhD, of the University of Washington. King and his colleagues explored self-control in adolescents as they progressed from grades 6 to 11. They found that the adolescents who had more self-control problems in sixth grade — such as talking out of turn in class or acting without thinking — were more likely to use alcohol, tobacco and marijuana as high school juniors.

Unsurprisingly, willpower also appears to be important in curbing alcohol use, as Muraven demonstrated in several studies. In one experiment, he found that social drinkers who exercised self-control in a lab setting went on to drink more alcohol in a supposed "taste test" than subjects who didn't previously dip into their self-control stockpiles. In another study, he found that on days when underage social drinkers found themselves having to exert more self-control

Developing good self-control as children may prevent substance abuse problems in teenagers and adults.





Understanding the role of willpower is likely to be important for developing effective treatments for addiction and in helping guide people toward making healthy choices.

than usual, they were more likely to violate their own self-imposed drinking limits. This finding provides more evidence that exerting willpower in one sphere can undermine your capacity to resist temptations in other, unrelated areas of life.

Understanding the role of willpower is likely to be important for developing effective treatments for addiction and in helping guide people toward making healthy choices, such as eating well, exercising and avoiding illicit substances. Research on willpower already offers suggestions for sticking with healthy behaviors. Strategies for managing willpower will be discussed later.



FURTHER READING

Appelhans, B., et al. (2011). Time to abandon the notion of personal choice in dietary counseling for obesity? *Journal of the American Dietetic Association*, 111(8), 1130–1136.

King, K., et al. (2011). Changes in self-control problems and attention problems during middle school predict alcohol, tobacco, and marijuana use during high school. *Psychology of Addictive Behaviors*, 25, 69–79.

Muraven, M. (2008). Autonomous self-control is less depleting. *Journal of Research in Personality*, 42(3), 763–770.

Muraven, M., & Shmueli, D. (2006). The self-control costs of fighting the temptation to drink. *Psychology of Addictive Behaviors*, 20(2), 154–160.

Muraven, M., et al. (2005). Daily fluctuations in self-control demands and alcohol intake. *Psychology of Addictive Behaviors*, 19(2), 140–147.

Muraven, M., et al. (2002). Self-control and alcohol restraint: An initial application of the self-control strength model. *Psychology of Addictive Behaviors*, 16(2), 113–120.

Tsukayama, E., et al. (2010). Self-control as a protective factor against overweight status in the transition from childhood to adolescence. *Archives of Pediatric Adolescent Medicine*, 164(7), 631–635.

Vohs, K., & Heatherton, T. (2000). Self-regulatory failure: A resource-depletion approach. *Psychological Science*, 11(3), 249–254.

Willpower, Poverty and Financial Decision-Making

Whether you're lured by new shoes or a new car, the temptation to buy is a familiar test of will. Just as unhealthy food choices have become ubiquitous, so too have opportunities for impulse spending. ATMs are everywhere, and online shopping means you can burn through your savings without ever leaving the couch. And, as in other areas of life, from overeating to resisting alcohol, people's purchasing behavior has been shown to be subject to willpower depletion.

Kathleen Vohs and Ronald Faber, a professor of mass communication at the University of Minnesota, studied willpower depletion and impulse buying. They showed volunteers a silent film clip in which a series of common one-syllable words appeared across the bottom of the screen. Some of the participants were instructed to actively ignore the words, a task known to require self-control. Afterward, participants paged through product listings for objects such as watches and cars and then reported how much they'd be willing to pay for each item. Subjects who had exerted self-control in the video task were willing to spend considerably more — \$30,037, on average, versus \$22,789 — than participants whose self-control hadn't been run down.

In a second experiment, Vohs and Faber tested subjects' actual spending behavior by presenting them with an opportunity to purchase low-cost items such as mugs and playing cards. Those who had previously exerted self-control in a lab exercise reported experiencing more temptation to buy. And in fact, they purchased a larger number of items and spent a greater amount of money than did participants who hadn't performed the willpower-draining task.

Financial decision-making may be even more challenging for people living in poverty. Princeton University doctoral candidate Dean Spears conducted a series of experiments in rural India to explore the link between willpower strength and poverty. In one, he visited two villages of different financial standing and offered people a chance to purchase a popular brand of body soap at a significantly discounted price. The soap was a good deal, but it still represented a difficult financial choice for individuals living in poverty.

Before and after the soap was offered, the participants were asked to squeeze an exercise handgrip, a common test of self-control strength. Spears found that

Just as unhealthy food choices have become ubiquitous, so too have opportunities for impulse spending.





Eliminating the decision of whether to spend or save helped customers avoid willpower failure.

FURTHER READING

Ashraf, N., et al. (2006). Tying Odysseus to the mast: Evidence from a commitment savings product in the Philippines. *The Quarterly Journal of Economics*, 121, 635–672.

Baumeister, R., et al. (2007). Free will in consumer behavior: Self-control, ego depletion, and choice. *Journal of Consumer Psychology*, 18(1), 4–13.

Spears, D. (2010). Economic decision-making in poverty depletes behavioral control (Working Paper No. 213). Center for Economic Policy Studies, Princeton University. Retrieved from <http://www.princeton.edu/ceps/workingpapers/213spears.pdf>

Vohs, K., Baumeister, R., & Tice, D. (2006). Self-regulation: Goals, consumption, and choices. In C. P. Haugtvedt, P. Herr, & F. Kardes (Eds.), *Handbook of Consumer Psychology*.

Vohs, K., & Faber, R. (2007). Spent resources: Self-regulatory availability affects impulse buying. *Journal of Consumer Research*, 33(4), 537–547.

richer participants squeezed the handgrip for about the same length of time before and after the soap-purchasing opportunity. Poorer participants, though, squeezed for a significantly shorter duration the second time around. Their willpower strength, he concluded, had been run down by their difficult financial decision-making.

In another study, Spears turned his attention to a cross-section of American shoppers. All shoppers, rich and poor, engage in economic decision-making. But financial decisions that are quick and easy for richer shoppers are likely to represent difficult tests of self-control among people who are financially insecure. Therefore, poorer shoppers, Spears reasoned, would likely experience a greater depletion of their willpower as they faced repeated, difficult financial decisions. And in fact, he found that poorer individuals were considerably more likely to consume food and drink while shopping than were richer individuals — an indicator that financial decision-making had run down their self-control stockpiles.

There is a silver lining to this research. If people in poverty are more prone to willpower depletion, then perhaps reducing the number of difficult decisions they must make can help to maintain their stores of self-control for future decisions. Harvard Business School economist Nava Ashraf, PhD, and colleagues demonstrated that effect among bank customers in the Philippines. They offered the customers a chance to open individual savings accounts, with a catch: The customers could withdraw their funds only after they'd reached a target date or target savings amount that they themselves had chosen. After a year, participants who enrolled in the accounts saved 82 percent more than customers in a control group who had not opened the special accounts. Eliminating the decision of whether to spend or save helped customers avoid willpower failure.

Together these findings suggest that people at the low end of the socioeconomic spectrum may be particularly vulnerable to a breakdown of their willpower resources. It's not that the poor have less willpower than the rich, rather, for people living in poverty, every decision — even whether to buy soap — requires self-control and dips into their limited willpower pool.

Strengthening Self-Control

A large body of research has been developed in recent years to explain many facets of willpower. Most of the researchers exploring self-control do so with an obvious goal in mind: How can willpower be strengthened? If willpower is truly a limited resource, as the research suggests, what can be done to conserve it?

Avoiding temptation is one effective tactic for maintaining self-control. In Walter Mischel's marshmallow study, the children who stared directly at the treat were less likely to resist it than were kids who closed their eyes, turned away or otherwise distracted themselves.

The "out of sight, out of mind" principle applies to adults, too. One recent study, for instance, found office workers who kept candy in a desk drawer indulged less than when they kept the candy in plain sight.

Another helpful tactic for improving self-control is a technique that psychologists call an "implementation intention." Usually these intentions take the form of "if-then" statements that help people plan for situations that are likely to foil their resolve. For example, someone who is watching their alcohol intake might say before a party, "If anyone offers me a drink, then I'll ask for club soda with lime." Research among adolescents and adults has found that implementation intentions improve self-control, even among people whose willpower has been depleted by laboratory tasks. Having a plan in place ahead of time may allow you to make decisions in the moment without having to draw on your willpower.

The research suggesting that we possess a limited reservoir of self-control raises a troubling question: When we face too many temptations, are we destined to fail? Not necessarily. Researchers don't believe that one's willpower is ever completely exhausted. Rather, people appear to hold some willpower in reserve, conserved for future demands. The right motivation allows us to tap into those reserves and persevere even when our self-control strength has been run down.

In a demonstration of this idea, Mark Muraven found that willpower-depleted individuals persisted on a self-control task when they were told they'd be paid for their efforts, or that their efforts would benefit others (such as helping to find a cure for Alzheimer's disease). High motivation, he concludes, might help overcome weakened willpower — at least to a point.

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Researchers who study self-control often describe it as being like a muscle that gets fatigued with heavy use. But there is another aspect to the muscle analogy, they say. While muscles become exhausted by exercise in the short term, they are strengthened by regular exercise in the long term. Similarly, regularly exerting self-control may improve willpower strength.

In one of the first demonstrations of this idea, Muraven and his colleagues asked volunteers to follow a two-week regimen to track their food intake, improve their moods or improve their posture. Compared to a control group, the participants who had exerted self-control by performing the assigned exercises were less vulnerable to willpower depletion in follow-up lab tests. In another study, he found that smokers who practiced self-control for two weeks by avoiding sweets or regularly squeezing a handgrip were more successful at quitting smoking than control subjects who performed two weeks of regular tasks that required no self-control, such as writing in a diary.

Others have also found that flexing your willpower muscles can strengthen self-control over time. Australian scientists Megan Oaten, PhD, and Ken Cheng, PhD, of Macquarie University in Sydney, assigned volunteers to a two-month program of physical exercise — a routine that required willpower. At the end of two months, participants who had stuck with the program did better on a lab measure of self-control than participants who were not assigned to the exercise regimen. The subjects also reported smoking less and drinking less alcohol, eating healthier food, monitoring their spending more carefully and improving their study habits. Regularly exercising their willpower with physical exercise, it seemed, led to stronger willpower in nearly all areas of their lives.

The finding that willpower depletion is tied to glucose levels also suggests a possible remedy. Eating regularly to maintain blood-sugar levels in the brain may help refuel run-down willpower stores. (But don't let the term "sugar" fool you. Healthy meals without refined sugar are actually better than sweets at keeping blood-sugar levels on an even keel, experts say.) Dieters, who are aiming to maintain willpower and cut calories, might do better eating frequent small meals rather than skipping breakfast or lunch.

The evidence from willpower-depletion studies also suggests that making a list of resolutions on New Year's Eve is the worst possible approach. Being depleted in one area can reduce willpower in other spheres, so it makes more sense to



focus on one goal at a time. In other words, don't try to quit smoking, adopt a healthy diet and start a new exercise plan at the same time. Taking goals one by one is a better approach. Once a good habit is in place, Baumeister says, you'll no longer need to draw on your willpower to maintain the behavior. Eventually healthy habits will become routine and won't require making decisions at all.

Many questions about the nature of self-control remain to be answered by further research. Yet it seems likely that with clear goals, good self-monitoring and a little practice, you can train your willpower to stay strong in the face of temptation.

Being depleted in one area can reduce willpower in other spheres, so it makes more sense to focus on one goal at a time.

FURTHER READING

Baumeister, R., & Vohs, K. (2007). Self-regulation, ego depletion, and motivation. *Social and Personality Psychology Compass*, 1(1), 1–14.

Baumeister, R., et al. (2006). Self-regulation and personality: How interventions increased regulatory success, and how depletion moderates the effects of traits on behavior. *Journal of Personality*, 74(6), 1773–1801.

Duckworth, A., et al. (2011). Self-regulation strategies improve self-discipline in adolescents: Benefits of mental contrasting and implementation intentions. *Educational Psychology*, 31(1), 17–26.

Oaten, M., & Cheng, K. (2006). Longitudinal gains in self-regulation from physical exercise. *British Journal of Health Psychology*, 11(4), 717–733.

Painter, J., et al. (2002). How visibility and convenience influence candy consumption. *Appetite*, 38(3), 237–238.

Muraven, M. (2010). Practicing self-control lowers the risk of smoking lapse. *Psychology of Addictive Behaviors*, 24(3), 446–452.

Muraven, M., & Slessareva, E. (2003). Mechanisms of self-control failure: Motivation and limited resources. *Personality and Social Psychology Bulletin*, 29(7), 894–906.

Muraven, M., et al. (1999). Longitudinal improvement of self-regulation through practice: Building self-control strength through repeated exercise. *Journal of Social Psychology*, 139(4), 446–457.

Webb, T., & Sheeran, P. (2003). Can implementation intentions help to overcome ego-depletion? *Journal of Experimental Social Psychology*, 39(3), 279–286.





Key Points and Conclusions

- Willpower is the ability to resist short-term gratification in pursuit of long-term goals or objectives.
- Willpower is correlated with positive life outcomes, such as better grades, higher self-esteem, lower substance abuse rates, greater financial security and improved physical and mental health.
- When willpower fails, exposure to an emotionally charged stimulus overrides one's rational, cognitive system, leading to impulsive actions.
- One's capacity for self-control appears to be persistent. Those with better self-control as preschoolers tend to have better self-control as adults.
- Individuals with low self-control show differing brain patterns when presented with tempting stimuli.
- Willpower can be compared to a muscle that becomes fatigued with overuse. Studies show that repeatedly resisting temptation drains the ability to withstand future enticements.
- Willpower depletion has a physical basis. Individuals whose willpower has been depleted have decreased activity in a brain region involved with cognition and have lower blood-glucose levels than those whose willpower has not been diminished.
- The effects of willpower depletion may be mitigated by positive moods, beliefs and attitudes.
- Willpower depletion impacts a range of behaviors, including food intake, substance use and abuse, and purchasing behavior.
- Financial decision-making may be even more depleting for people living in poverty, since virtually all financial decisions are likely to represent difficult tests of self-control.
- Avoiding temptation and planning ahead are effective tactics for maintaining self-control in the face of temptation.
- With the right motivation, people may be able to persevere even when their willpower strength has been depleted.
- Maintaining steady blood-glucose levels, such as by eating regular healthy meals and snacks, may help prevent the effects of willpower depletion.
- Because being depleted in one area can reduce willpower in other spheres, it is more effective to focus on a single goal at a time rather than attacking a list of multiple resolutions at once.
- Just as muscles are strengthened by consistent exercise, regularly exerting self-control may improve willpower strength over time.



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What You Need to Know about Willpower: The Psychological Science of Self-Control was written by Kirsten Weir.

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