Self-regulation, controlled processes, and the treatment of addiction

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1 Introduction

Addictive behavior is often tragic for the addict and his or her loved ones. Addicts behave in ways that seem irrational and incompatible with conscious, deliberate choice. After all, no one thinking clearly would choose to be an addict. The traditional scientific perspective on addiction has been to treat it as a disease of the mind brought on by the consumption of drugs (e.g., Jellinek 1960). The implication is that the drugs take over the mind, causing the addict to lose control over his own choices and actions. This perspective is also consistent with popular methods of treating addiction. For example, Alcoholics Anonymous asks addicts to submit to a higher power and to acknowledge their powerlessness over alcohol. Thus, the traditional perspective is that unconscious, automatic, and uncontrolled processes determine addictive behaviors. From this perspective there is little room for consciously controlled processes such as choice, preference, willpower, and future planning.

In this chapter, however, we explore a complementary view. In reading the scientific literature, we have found that consciously controlled processes are indeed very important for explaining addictive behavior (Baumeister and Vonasch 2015; Baumeister et al. 2015). Automatic processes surely do contribute to addictive behaviors, but so do consciously controlled processes. Addicts use willpower and planning both to use and to stop using drugs (Baumeister and Vonasch 2015; Baumeister et al. 2015). Addicts consciously choose to use drugs because they like the subjective experiences the drugs provide (Heyman 2009). Unconscious, automatic processes are nonetheless important because they influence how motivated people are to use drugs. People who strongly enjoy drugs (or who dislike the feeling of not using drugs because they suffer withdrawal symptoms or because they are self-medicating) are presumably much more vulnerable to addiction than people who dislike drug experiences. While automatic processes often determine people’s motivations to use drugs,
people consciously control when they actually use drugs. For example, even a person “hopelessly” addicted to crack will usually exert self-control to avoid lighting up until he is beyond the sight of a police officer. In our view, the fact that addicts use self-control in this and other ways offers hope that they can control their behavior to cease their problematic use.

Elsewhere (i.e., Baumeister and Vonasch 2015; Baumeister et al. 2015), we have reviewed the literature and concluded that addicts use conscious processes to regulate their addictive behaviors in each stage of addiction: i.e., the stage before regular use, the stage of regular use, the stage of quitting or reducing use, and the stage of maintaining sobriety (or reduced levels of use). In this chapter, we only have space to summarize the major findings from those reviews and their implications for treatment. We first introduce the reader to the most up-to-date scientific theories about consciously controlled processes, especially willpower (called self-regulation in the scientific literature). We then apply these theories to explain addictive behaviors. We focus in this chapter on the controlled processes involved in the quitting and sobriety maintenance stages of addiction. Based on our understanding of these controlled processes, we offer some treatment suggestions to aid addicts in quitting and in maintaining sobriety or reduced levels of drug use. Many of the treatment suggestions we make will be familiar to readers, but we think it may be useful to think about these treatments from the perspective that many addictive behaviors are controlled rather than out of control.

2 Self-regulation theory

Self-regulation refers to the ability to override one’s impulses and exert top-down control over the self’s thoughts, emotions, impulses, or actions (Baumeister et al. 1994). When Sally has an urge to smoke a cigarette and decides to wait until her lunch break, she is self-regulating the timing of her behavior. If she decides to distract herself from her urges by thinking about
something else, she is regulating her thoughts (and desires). Self-regulation usually involves overriding and inhibiting an automatic, intuitive thought, emotion, impulse, or action (Baumeister et al. 1994). However, self-regulation can also involve doing something rather than nothing when the automatic impulse is to be passive (Vohs et al. 2014). For example, when Brad is feeling lazy but decides to get off the couch and go to the gym anyway, he is self-regulating his behavior. A person is self-regulating whenever he changes his behavior to do something other than what his initial intuitions would motivate.

Self-regulation by definition involves a directed change in behavior, not just a random different behavior. People self-regulate in order to bring their behavior in line with standards. Standards can take many forms, including ideals, norms, values, goals, peer expectations, and desires to behave consistently with one’s past self. These may be set by others. For example, Sally waited to smoke a cigarette until her lunch break because of a rule established by her employer or government stipulating that employees are not allowed to smoke except on designated breaks. In addition, however, many standards are self-imposed. For example, Stan is attempting to curtail his drinking by setting a three-drink limit for himself each night.

Thus, standards help to guide people’s behavior. To know when to self-regulate, people compare their behavior to a standard and adjust their behavior until it meets the standard (Carver and Scheier 1981, 1982). Clear standards aid self-regulation because they make it easy to know when behavior is sufficiently adjusted. Clear, explicit standards constitute what some call “bright lines,” referring to the fact that one cannot miss that one is crossing the line (Ainslie 2001). Zero drinks is a bright-line rule, because consumption of any amount is a clear violation. Trying to drink less is not a bright line because there are many different ways of calculating “less.” This is likely a reason why many treatment programs, including Alcoholics Anonymous, require clients
to remain completely abstinent. When standards are unclear or conflicting, self-regulation is hampered because it is difficult to know when self-regulation has been successful.

To successfully adhere to a standard you must attend to both the standard and your behavior. Although it may seem as though you are always aware of your own behavior, psychologists have shown that people are not always self-aware enough to regulate their behavior successfully. Several factors can impair the self’s ability to monitor behavior and thereby weaken self-regulation, including intense emotions, distractions found in social settings like bars and parties, and intoxication. People often find it difficult to keep track of their participation in a busy evening’s events even when sober, let alone while drunk or high. Studies have shown that alcohol reduces self-awareness (Hull 1981), so it is especially difficult to monitor your own behavior when you have been drinking. As a result, alcohol users have impaired self-regulation across a variety of domains: they eat more, smoke more, spend more money, leave overly large tips, are less modest, and drink more alcohol (Baumeister et al. 1994). For a person trying to quit alcohol or other drugs, drinking alcohol disrupts the monitoring process and makes it even harder to know when to stop. This can result in a vicious cycle of increasing consumption.

If you know your desired standard of behavior and you know that you are currently not meeting that standard, you may still fail to achieve the standard because of a lack of willpower. One perspective on self-regulation that has engaged our laboratory is the limited resource model of self-regulation (Baumeister et al. 1994; Baumeister et al. 1998; Muraven and Baumeister 2000; Baumeister et al. 2007). The core idea is that the self’s ability to regulate behavior is limited by a resource that becomes depleted with effort. In other words, willpower is limited.
Many studies have been conducted testing this idea using a dual-task paradigm in which participants who engaged in self-regulation in a first task performed worse on any subsequent task that also required self-regulation. For example, participants in one study (Baumeister et al. 1998) were randomly assigned to either restrain themselves from eating a plate of freshly-baked cookies and instead taste test a plate of radishes, or to indulge in the cookies and leave the radishes alone. Of course, it is much easier to enjoy the cookies than to restrain oneself from eating them and instead eat bitter radishes. In the second part of the experiment, participants were given a puzzle to solve that actually had no correct answer (i.e., the puzzle was impossible). Experimenters timed how long the participants took before giving up. Participants who had depleted their willpower by restraining themselves from eating the cookies gave up sooner on the puzzle than participants who had been allowed to eat the cookies. We call the depletion of willpower “ego depletion,” in recognition of its similarity to an old Freudian theory of the operations of the ego.

Recent theoretical developments have added nuances to the theory (Baumeister and Vohs 2014). It is now clear that ego depletion is not caused by running out of the limited resource. Rather, depleted people restrict their usage of the resource in order to conserve it for the future (Muraven et al. 2006). Even depleted people can use willpower, but they often choose to conserve their energy instead (Beedie and Lane 2012). This is good news for people struggling to avoid addictive behaviors. Even when depleted, people can exert willpower if they are motivated enough. However, exerting willpower feels very effortful and every feeling and desire tends to feel more extreme when people are depleted (Vohs et al. 2014). One should not count on strong motivation to overcome strong desires forever. People who are severely depleted may ultimately exhaust their resources (Baumeister and Vohs 2014). Because any act of self-regulation can
deplete the resource, a person who is attempting to quit drugs should avoid exerting self-regulation for other purposes (such as dieting, or completing a difficult assignment at work) while quitting.

There is some evidence that glucose in the bloodstream (a chemical used for energy by the brain and body) relates to the limited resource (Gailliot et al. 2007; Gailliot and Baumeister 2007). Diversion of glucose from the brain to other body parts can lead to symptoms resembling depletion. For example, during the late luteal, or premenstrual, phase of the menstrual cycle, many women experience symptoms of premenstrual syndrome (PMS) as the ovaries increase their metabolic expenditures and use more glucose (Webb 1981, 1986). This may leave less glucose available for self-regulation, implicated by PMS symptoms’ resemblance to ego depletion (Gailliot et al. 2010). Women’s use of nicotine, caffeine, alcohol, and nonprescribed drugs increases during the late luteal phase (Mello et al. 1987; Marks et al. 1994; Snively et al. 2000). Alcohol also reduces blood glucose, which may partially explain why alcohol impairs self-regulation.

Willpower can be trained, much like strengthening a muscle (Muraven et al. 1999). Thus, in the long term, exercising willpower strengthens it, but in the short term, exercising willpower depletes it. Training willpower has been shown to increase the successful quitting rates of smokers. For example, one study assigned participants to practice squeezing a hand grip for as long as they could twice a day or to resist sweets all day for two weeks before attempting to quit smoking (Muraven 2010). Those who practiced these habits—which required self-regulation to monitor and change thoughts and behavior—were more successful at quitting smoking than participants who performed easy and brief math problems or wrote down their urges in a diary, which did not require self-control.
3 Addiction

Although we do not have space to fully describe the theory of controlled processes within addiction (see Baumeister et al. 2015), here we briefly outline the main arguments. The word addiction originally referred to a strong desire for something, but now it more often refers to a problematic desire (Orford 2001). The stereotypical view of addiction is that it is characterized by an overwhelming, perhaps uncontrollable and irresistible craving. This view is advocated by some scholars, such as Leshner (1997, 1999), who view addiction as a brain disease. We do not dispute that addiction, like all mental phenomena, is mediated by brain processes. What we take issue with is the idea that, because addiction changes the brain, it does so exclusively through uncontrolled processes that bypass the self. The available evidence supports the idea that the conscious self plays an integral role in establishing a pattern of addictive behavior.

Addiction is not just a brain state but a pattern of addictive behavior. At any one point in time, an addict may face a desire to use. A recent study by Hofmann et al. (2012) found that desires for alcohol and tobacco among regular drinkers and smokers (not all of whom were clinically addicted) were actually weaker on average than all other desires, and they were less likely to be rated as “irresistible.” Desires to drink and smoke were quite frequent, however, and that may be a key to understanding addiction. It is not that one must use a tremendous amount of willpower to overcome an overwhelming urge to smoke, but that one must use a little bit of willpower many times each day. Viewed in that way, it is hardly surprising that many people fail to suppress those urges every single time.

What differentiates an addict from a casual user is the degree of problematic use. Addictive behavior is characterized by a series of dysfunctional, impulsive choices to use drugs despite substantial negative consequences (Redish et al. 2008; Heyman 2009). As we said earlier,
it is likely that no one ever decides to become a drug addict. But people do choose to use drugs each time they use them (aside from rare cases in which people are coerced to use drugs). Most of these everyday decisions to use drugs are guided by short-term, pleasure-seeking motivations. People use drugs because drugs make them feel good (or because drugs prevent them from feeling bad). Using drugs once usually has few negative consequences, but using drugs repeatedly can be seriously detrimental to health, finances, occupational performance, and social relationships.

Some theorists have promoted the brain disease theory of addiction by pointing to evidence of brain changes linked to long-term addiction (Leshner 1997, 1999; Robinson and Berridge 2003). However, these changes do not indicate that people lose the ability to choose and control their actions. As critics such as Schaler (2000) and Heyman (2009) have pointed out, the changes are mainly localized in the so-called desire centers of the brain rather than the motor control centers. Thus, when addiction changes the brain, it changes the patterns of wanting, not the ability to control one’s movements. The addict does not lose control; rather the addict develops a persistent desire to use drugs for their pleasurable effects and to avoid displeasure from not using drugs.

Addiction does not begin or end overnight. The life course of addiction and addictive behaviors can be subdivided into four heuristic stages (Baumeister and Vonasch 2015; Baumeister et al. 2015). These stages are only guidelines to help think about addictive behaviors, rather than rigidly differentiated steps. For example, it may not usually be possible to specify the exact moment at which a person becomes “addicted.” The four stages are pre-addiction, regular use, fighting against addiction, and fighting against relapse. We will not discuss the pre-addictive or regular use stages further, except to emphasize the importance of the addict’s decision to cease
regular use and fight against addiction. The remainder of the chapter focuses on the decision to fight against addiction, the self-regulatory processes involved in fighting against addiction, the self-regulatory processes involved in fighting against relapse, and treatment suggestions for fighting against both addiction and relapse.

4 Deciding to fight against addiction

Given our view that many addictive behaviors are the result of controlled but unwise and problematic choices, treating addicts primarily involves helping them make better choices. The first step for an addict is to resolve to reduce or eliminate her use of the problematic substance or substances. The literature is very clear that an addict is most successful in quitting when the addict decides herself (albeit sometimes with encouragement from others) to cease problematic use (e.g., Chapman and Mackenzie 2010; Miller and Rollnick 1991; Liskow et al. 1990). Coerced sobriety rarely lasts long beyond the coercion (Freedberg and Johnston 1978; Gallant et al. 1973; Rosenberg and Liftik 1976). When self-motivated, however, many people can quit or reduce consumption to non-problematic levels. Many people who at one time abused substances now continue to use those substances at rates deemed not problematic (Heather and Robertson 1981; Zinberg 1984).

4.1 Motivations to quit

Most addicts (including those who meet the clinical diagnostic standards laid out in the Diagnostic and Statistical Manual of Mental Disorders) quit without seeking formal treatment (Chapman and Mackenzie 2010; Heyman 2009). For example, since the Surgeon General’s first report linking smoking to cancer, many millions of people quit smoking, and 90% of them did so without professional help or treatment (American Cancer Society 1989). Far more people were
addicted at some point in life than are currently addicted, which indicates that most people do stop their addictive behaviors (Compton et al. 2007).

For many people, a lifestyle change precedes quitting. For example, during the Vietnam War, 20% of American soldiers in Vietnam met clinical standards for narcotics addiction. But upon returning home, the addiction rate among Vietnam veterans fell to only 1%, mostly without formal treatment (Robins et al. 1975). Many aspects of military life in Vietnam may have been conducive to heroin use: combat, stress, uncertainty, danger, boredom, tolerant norms, and the easy availability of the drug. Most of these diminished or vanished upon returning home to the United States. Most addicts apparently decided that abusing narcotics would interfere with work, family, and the other trappings of civilian life.

Other lifestyle changes are less dramatic than returning from war but nonetheless are associated with reduced addiction rates. Many people quit addiction in connection with major pragmatic and symbolic life changes, including becoming a parent, getting married, or having a brush with death (Russell and Davies 2009). Events like these catalyze not only the decision to quit but also immediate attempts to do so, as opposed to planning and waiting to quit. Smokers who try to quit immediately after deciding to quit are more likely to remain abstinent from smoking (for at least six months) than those who delay their plan (West and Sohal 2006). In general, people abuse drugs more when they do not have other good uses of their time, and people use drugs less when they have other important uses of their time (Heyman 2009).

The central role of personal enjoyment suggests that voluntary, self-serving behavior is an important component of addiction. Although it may be that some addicts use only from fear of withdrawal or the discomfort that accompanies abstinence (e.g. Kristeller 1994; Naqvi and Bechara 2010), enjoyment is in general a good predictor of continued use. On the whole, the
more addicts like their drug, the less likely they are to quit. People who expect alcohol to be especially pleasurable have low rates of success in quitting (Brown 1985). Likewise, about half of smokers who know the habit is bad for them reported continuing to smoke because of the enjoyment derived from it and the other half because it relieved stress (Fidler and West 2009). As mentioned before, positive feelings or avoidance of negative feelings play a large role in continued drug use. For example, one study found that individuals who had the most positive emotional response to smoking after a night of abstinence were most likely to relapse (Strong et al. 2011). This positive feedback undermines the necessary initial desire to quit, the catalyst to use self-regulation to alter relevant thoughts and behaviors.

4.2 Beliefs about addiction

Because addiction is about choice more than physiological dependence, addicts’ beliefs about addiction affect their decisions to continue abusing drugs (Heather et al. 1982, 1983). Many addicts deny that they have a problem with drugs because they believe they can overcome any deleterious effects of drugs. The problem is that addicts do not always know when their addiction becomes a problem for themselves and for other people. The implications of people’s lack of realization of their problem can be tragic. In 1995, Shannon Hoon, lead singer of the talented band Blind Melon, sang about his drug use, claiming that “I smoke a lot of grass, and I pop a lot of pills, but I’ve never done nothing that my spirit couldn’t kill.” \(^1\) Ironically, Hoon died of an overdose not long after recording those lyrics.

It may be difficult to persuade an addict to quit using drugs insofar as drugs are pleasurable. Observers may readily see the negative consequences, such as the expense or the danger, but addicts may not adequately consider those costs. Another eminent musician, Layne

\(^1\) The lyrics were slightly altered from the original version of “The Pusher” by Steppenwolf to emphasize Hoon’s purported ability to withstand the effects of the drugs.
Staley (vocalist for Alice in Chains), much beloved by some of the present authors, sang about his decision to use drugs, claiming a seemingly rational basis for his addiction: “What’s my drug of choice? Well what have you got? I don’t go broke, and I do it a lot.” Staley also died of a drug overdose. Ultimately, addiction can be a costly and even fatal disorder, but many addicts presumably do not acknowledge the danger. Hence two important first steps toward recovery are acknowledging the problem and deciding to stop abusing drugs.

One of the most effective treatments for addiction is “motivational interviewing” (Miller and Rollnick 1991). This is a very simple treatment that focuses on helping the addict decide to quit and giving him resources to help guide him to a successful treatment plan when he does decide to quit. Motivational interviewing can take as little as fifteen minutes—just enough time to discuss the pros and cons of continued drug use and to help the addict reach his own conclusion that he must quit drugs. Obviously, a brief interview contains no opportunity to reduce an addict’s drug tolerance or address any physiological problems. Nonetheless, two meta-analyses of the scientific studies on motivational interviewing have shown it to be highly effective in improving successful quit rates (Burke et al. 2003; Rubak et al. 2005). Motivational interviewing, like other motivational treatments, is effective because it changes people’s minds about addiction and helps them decide to fight against addiction.

5 Self-regulation in fighting against addiction

Once an addict has decided to fight against addiction, he or she must self-regulate to succeed. In this section, we will apply the theories of self-regulation described earlier to explain how addicts succeed or fail in attempting to rein in their problematic drug use. Once a person has been addicted to a substance and used it regularly for some time, the person’s use may have
become habitual. Therefore, self-regulation in the fighting against addiction phase is primarily used to override the bad habits developed in the regular use phase.

5.1 Standards

To change one’s habits, one must first know which habits one wishes to change, and how. Thus, as we mentioned before, self-regulation begins with determining clear standards for behavior. Many drug treatment programs establish very strict behavioral standards, most commonly complete abstinence. There are costs and benefits to this approach. The main benefit of such bright lines is that they are eminently clear and unambiguous standards — and clear standards are extremely helpful for successful self-regulation. But there are also two possible risks. First, a person may be less likely to decide to fight against addiction if the standard appears unattainable or miserable. A person may decide it is not even worth trying to reduce his drinking or drug use if one must maintain complete abstinence to meet the standard. It may seem too painful, or he may simply enjoy drinking too much to give it up entirely. Adopting less stringent, but still clear, standards may help avoid this risk. For example, an alcoholic might be willing to adhere to a one-drink limit, thereby dramatically reducing his drinking without having to give it up entirely.

The second risk is that setting a very stringent standard means that one has failed as soon as there is any violation, which can be severely demotivating (Marlatt and Gordon 1985). For instance, an addict may begin a program for quitting smoking in which complete abstinence is required. At some point, she may have a lapse of judgment or willpower and have a single cigarette. Once she has broken the rule that smoking is forbidden, she may think to herself, “what the hell, I might as well enjoy myself tonight. I’ll quit again tomorrow.” She may then proceed to smoke an entire pack. This phenomenon is known informally to researchers as the
“what the hell effect” and more formally as the abstinence violation effect (Cochrane and Tesser 1996; Herman and Polivy 1983). When people violate a standard even by a little bit, they may decide to overindulge because they have failed already, and (to them) a large failure is not qualitatively different from a small failure. This is a major downside to setting a standard of complete abstinence and believing that a single violation of that means you “fell off the wagon.” As violations, a sip and a three-day binge count the same... But, of course, a binge is much more damaging than a sip.

5.2 Motivations for quitting

For an addict to quit successfully in the long term, the addict usually must be internally motivated to adhere to the standards. Treatments in which addicts are coerced into quitting (an external motivation) may be successful in forcing the addict to quit, but once they are complete, addicts tend to begin using again because they enjoy using and they did not make a conscious decision (internal motivation) to quit (Freedberg and Johnston 1978; Gallant et al. 1973). When drinkers are persuaded to quit to avoid punishment, they tend to quit until the threat of punishment is removed (Rosenberg and Liftik 1976). Celebrity addicts cycle through numerous treatment programs in which they are sober for several weeks, but shortly afterwards begin drinking again. In our framework, these relapses occur because the treatment programs offer strong external motivations to not drink during the program, but once she returns to the glamour of Hollywood, both her internal and external motivations change so it is rewarding and enjoyable to have a drink.

Externally imposed standards can be effective, but usually only in the short run. An example of an externally imposed standard is contingency management therapy (e.g., Petry et al. 2000). Contingency management entails rewarding people for good behavior (abstinence, in
most cases), or punishing people for bad behavior (i.e., using the abused substance). In the most effective contingency management programs, addicts receive a small reward (usually money) for each sequential day of abstinence. The rewards increase daily, such that on the first day you may only receive $1, but on the second day you receive $2, and so on. By the tenth day, you might really want to smoke a cigarette, but doing so would not only cost you $10 today, it would also mean starting over at $1 tomorrow, instead of the $11 you could earn by remaining sober. Of course, these programs cannot last indefinitely: they cost a substantial amount of money, even though the per diem payment eventually plateaus. The trouble is that these programs are most effective only as long as the payments continue. Many smokers who had successfully stopped smoking for 18 continuous months during a contingency management program began smoking again once the payments stopped (Volpp et al. 2009).

Other external incentives have been tried, and are effective, though temporarily. For example, one study offered abstinent smokers a trip to Hawaii (King et al. 1987). Again, the incentive increased quit rates, but they were short-lived. Some people do quit long-term for external reasons, as long as the long-term reasons remain reasons. For example, almost 100% of physicians who wrote a resignation letter in case of a potential failed drug test remained abstinent for the duration of their career (Crowley 1984).

Internal motivation to quit appears to be essential for long-term success. Addicts who have decided for themselves that they want to quit and that they intend to quit are indeed more likely to quit than those who merely perceive that society or their peers think they ought to quit (Smit et al. 2011). Again, most addicts quit on their own without any formal counseling or therapy (Chapman and Mackenzie 2010). We believe this is because the main reason for prolonged addiction is that, although addicts may want to quit, they do not want to abstain from
using on any particular occasion. This does not mean that therapy is unhelpful or unnecessary. As we stated before, therapies like motivational interviewing are highly effective at helping people recognize their problem and motivating them to solve it earlier than they would have on their own (Miller and Rollnick 1991).

5.3 Self-efficacy

People are unlikely to attempt to quit if they believe it will not be possible to quit. To quit successfully, an addict must believe it is possible to stop using. In technical terms, the addict must possess self-efficacy or, more precisely, the belief that it is possible to quit. Several studies have shown that smokers with high self-efficacy were more likely to quit (and less likely to relapse) than smokers with low confidence in their ability to quit (e.g., DiClemente 1981; Garvey et al. 1992). Higher self-efficacy is also associated with greater rates of quitting alcohol (e.g., Solomon and Annis 1990). Presumably, self-efficacy is important because if you do not believe you are capable of quitting (either on your own or with the help of a particular treatment program), you would have little reason to put in effort. At the first sign of possible failure, rather than buckling down, you might give up. However, self-efficacy is also important for another reason.

Having high self-efficacy may actually reduce the temptation to smoke (DiClemente et al. 1985). People who believe they cannot quit (i.e., have low self-efficacy) report being very tempted to smoke. Among people who actually do quit, however, there was only a minimal correlation between temptation strength and self-efficacy. In other words, people who did quit often did so despite being very tempted to use again. Therefore, having strong temptations did not make it impossible to quit. But believing that it is impossible to quit may actually make it harder to quit because it increases the temptation to give in to one’s urges.
5.4 Willpower

Controlling one’s behavior is a form of self-control and, according to the limited resource theory, self-control depends on willpower. Many sources of evidence confirm that willpower is one potent key to stopping addictive behavior. For one thing, people who report having higher overall trait self-control are both less likely to become addicted and more likely to successfully quit than people with low trait self-control. People with high trait levels of self-control are more likely to successfully quit smoking than people with lower self-control (Brandon et al. 2003). Furthermore, low self-control behaviors like failing to use seatbelts are more common among habitual smokers than nonsmokers (Remington et al. 1985). People whose willpower has been depleted also tend to drink more alcohol than less-depleted people (Christiansen et al. 2012).

People high in trait self-control are not necessarily better at resisting a temptation that is staring them in the face. Rather, people high in trait self-control tend to avoid dangerous situations in which they might be tempted (Fishbach and Shah 2006). Avoiding the need to use willpower is a better strategy than counting on the strength of one’s willpower to hold up in the face of temptation.

Because willpower relies on a limited resource, addicts have a particularly difficult time fighting addiction when they are also self-regulating other aspects of their behavior. For example, people who attempted to diet and quit smoking at the same time were less successful at quitting smoking than people who focused their mental energy on quitting smoking and did not attempt to restrict their diet (Patten and Martin, 1996). People who lead particularly stressful and busy schedules are more likely to fail when attempting to restrict their drinking than people with less busy and depleting schedules (Muraven et al. 2005). Other experiments suggest this is not simply a case of busy people drinking more. People who were randomly assigned as part of an
experiment to do a depleting task (as opposed to an easy task that did not require self-regulation) also drank more than they intended to (Muraven et al. 2002). Although we are not aware of any experiments testing the effects of depletion on the use of hard drugs (such studies may not have been done, for ethical and practical reasons), the theory would suggest that addicts with depleted willpower would also be more likely to fail to restrain themselves from using hard drugs.

Depletion may be of particular concern for smokers because smoking itself reduces the depletion effect (Heckman et al. 2011). Smokers may therefore rely in part on cigarettes to help them regulate themselves throughout their day and in order to reduce depletion from other domains in their life. Therefore, when quitting smoking, even more so than when quitting other drugs, it may be especially important to avoid stress and other depleting situations.

Recall that willpower can be trained, helping addicts to quit. The smokers who were asked to do simple self-control exercises (avoiding sweets or performing daily handgrip exercises) for two weeks before quitting smoking more than doubled (from 12% to 27%) their rate of success in quitting smoking for at least one month (Muraven 2010). Quitting smoking is clearly a difficult thing to do, but training willpower may be a great new tool to help people quit.

Based on the limited resource theory of self-regulation, we recommend addicts train their willpower by performing willpower exercises before attempting to quit (see Muraven 2010). Timing is critical. Training willpower during quitting may deplete one’s willpower and make it even harder to quit. Willpower exercises should be performed daily for at least two weeks before quitting. We also recommend quitting during a period of reduced stress, when willpower reserves will be at their highest. Quit during vacation, or a slow period at work. Try to keep a positive mood, as this alleviates depletion (Tice et al. 2007). If possible, addicts should think about how quitting affirms one of their own core values, as this also alleviates depletion.
(Schmeichel and Vohs 2009). When tempted, addicts should think in terms of the long term consequences of quitting (they will be healthier, more productive at work, have a better family life, etc.) rather than the immediate pleasure they could have by drinking, smoking, or otherwise consuming their drug of choice.

6 Self-regulation for fighting against relapse

When a person has successfully self-regulated to reduce drug use to reasonable levels, the next stage is avoiding relapse by maintaining reasonable levels of use (or complete abstinence) for the duration of the person’s life. From the perspective of a physiological addiction, this should become easier over time as the addict’s brain reconfigures itself to adjust to life without its drug. From a self-regulatory perspective of addictive behavior, the risks of relapse persist for different reasons. Primarily, former addicts are at risk of relapse because they are fully aware of the pleasurable effects of the drug. Even decades after quitting alcohol, for instance, an addict might seek the pleasure of a drink because he remembers how good alcohol used to make him feel. (In this perspective, use of the drug is itself self-regulation, because the person uses it to adjust his or her mood and emotional state.) The more pleasurable the addict remembers the drug to have been, the more likely he is to begin using again, even long after the quitting. For example, the more positive people expect alcohol to be, the less likely they are to maintain sobriety after quitting (Brown 1985). Pleasurable memories of drug use present risks that all former drug users face.

As when fighting to quit drugs in the first place, maintaining sobriety requires self-regulation. Most of our advice for quitting also applies to avoiding relapse. Maintaining clear behavioral standards remains key. Former addicts must maintain clear rules about what behaviors they allow themselves and which behaviors violate their standards. Efficacy remains
important. People must believe they are capable of remaining sober. And people must maintain willpower to avoid temptation.

The long-term nature of fighting against relapse offers special challenges for preserving willpower. One should not think of fighting addiction as doing mental battle against a single powerful urge. Maintaining sobriety is more like swatting away a particularly persistent mosquito. It is not very difficult to swat the mosquito any one time, but one must persist in swatting it every time, or risk relapse. Like a mosquito, addicts’ urges to use come frequently, but do decrease in strength and frequency over time (Hofmann et al. 2012). It would be easy after several months or years of sobriety to become complacent and assume further addictive behaviors are not a risk. Because willpower can become depleted, however, whenever an opportunity to use arises, the addict must hope that his willpower stores are adequate to resist. No studies have been done to test whether training willpower is effective in the long-term. It is likely that continuing to train one’s willpower would maintain one’s willpower strength, but this idea should be accepted only tentatively.

6.1 Avoiding Temptation.

The best strategy for avoiding self-control failure is to avoid tempting situations. For most addicts this will involve self-regulating to reorganize important parts of one’s life, including repograming habits and changing social groups to avoid other drug users.

Addicts who resist making the required life changes may find it very difficult to quit. Imagine trying to abstain from drinking yet going to the bar with your old drinking buddies every Friday. Every week you would be tempted to drink, and a single lapse in judgment could end your sobriety. It would be much easier to avoid the bars altogether. Any time you put yourself in a situation in which you habitually used drugs, your automatic inclination would be to use, and
you would have to control and restrain yourself. Making lifestyle changes that remove an addict from temptation is a strong strategy, and research shows that it is highly effective (Marlatt and Donovan 2005). People who change their lifestyles so that they do not face frequent temptations are far more likely to remain abstinent. From our self-regulatory perspective on addiction, this is because it is easier to avoid situations that require willpower than to use willpower to resist temptations.

**6.2 Avoiding relapse from a single failure**

Many people assume that an addict who has failed to abstain one time has relapsed. It is true that many people who, after quitting, smoke a single cigarette, or have a single drink, tend to “fall off the wagon” and relapse into regular use (Garvey et al. 1992). However, there is no evidence that this occurs because that single cigarette or drink takes over the person’s motor cortex and forces him to smoke or drink in excess. More likely, the belief that having a single cigarette or drink irreparably ruins one’s sobriety causes the addict to think “what the hell” and go on a binge.

One clever study tested these two competing ideas to explain why smokers who smoke a single cigarette tend to relapse (Juliano et al. 2006). A group of regular smokers abstained for four days and then were randomly assigned to one of three conditions for the fifth day of the study. On that fifth day, participants were either given 5 real cigarettes, 5 denicotinized cigarettes, or no cigarettes to smoke. The researchers then offered monetary rewards to participants if they did not smoke for an additional six days. The key result was that participants who had smoked either type of cigarette on day five were more likely to relapse within the next six days than participants who did not smoke on day five. The study showed that the nicotine did not cause relapse, because participants who smoked cigarettes with the nicotine removed were
just as likely to relapse as participants who smoked cigarettes with nicotine. A more likely explanation is that participants who believed they had already “ruined” their streak of abstinence were more likely to give up and stop fighting against relapse.

7 Treatment suggestions

In this section we briefly summarize treatment suggestions that are consistent with or that arise from the self-regulation model of addictive behaviors. Self-regulation requires motivation, clear behavioral standards, and the use of willpower to adhere to those standards. Continued successful self-regulation entails avoiding relapse. Therapeutic techniques that increase motivation to avoid substance abuse, provide clear behavioral standards, and strengthen and maintain willpower to adhere to those standards will likely aid in controlling addictive behaviors. Maintaining motivation, standards, and willpower are also needed to avoid relapse, though a complementary strategy is to avoid situations in which willpower will be needed. Realistically, it may be impossible to completely avoid situations in which one might be tempted. For example, an alcoholic probably cannot avoid all grocery stores in which alcohol is sold. Therefore, we recommend a combination of maintaining motivation, adhering to clear standards, strengthening willpower and avoiding situations in which willpower must be used to control addictive behaviors.

8 Conclusion

In this chapter, we have briefly summarized the self-regulatory theory of addiction (Baumeister and Vonasch, 2015; Baumeister et al. 2015). This theory holds that self-regulatory processes are fundamental to understanding addictive behaviors. We summarized the role of self-regulation in quitting addiction and preventing relapse. We also offered treatment suggestions for helping addicts quit (or reduce usage to reasonable levels) and for helping them prevent relapse.
References


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