

Addiction, Compulsion, and Persistent Temptation

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Abstract Addicts sometimes engage in such spectacularly self-destructive behavior that they seem to act under compulsion. I briefly review the claim that addiction is not compulsive at all. I then consider recent accounts of addiction by Holton and Schroeder, which characterize addiction in terms of abnormally strong motivations. However, this account can only explain the apparent compulsivity of addiction if we assume—contrary to what we know about addicts—that the desires are so strong as to be irresistible. I then consider accounts that invoke the phenomenon of “ego depletion,” according to which a person can resist temptation for a while, but not indefinitely. Implicit in this account is the assumption that addiction-related desires persist long enough to deplete the addict’s willpower. The balance of the paper argues that the persistence of the desire to consume drugs is a significant form of dysfunction in its own right, and that it makes an important and independent contribution to the compulsivity of addiction. I argue that addiction involves dysfunction in a mechanism that normally prevents a person from being tempted to do something that would invite disaster.

Keywords Addiction · Compulsion · Motivation · Craving

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1. My former neighbor, a college-educated, middle-class man with a spouse, a young child, and a nice home, was convicted of embezzling. He got a year in the county jail, with a day-time work release. At the work-release job, he was caught using and dealing OxyContin. He is now serving 4 to 20 years in prison many miles away from his family, who lost their house and moved in with relatives.

Another man began drinking as a teen. He had a career in radio, eventually becoming an on-air reporter. He sometimes drank before driving to report on traffic accidents—some involving drunk drivers. He drank at home while calling in fake news reports over the air. Finally, a close call with police investigating a murder convinced him to join Alcoholics Anonymous. But, he reports, “I might get a good 6 months of sobriety under my belt, but then I would get a bottle to celebrate.” [1, pp. 452–55].

As these examples show, drug use can sometimes be so irrational and so self-destructive that it is difficult to believe that it is completely free. It is tempting to see people in cases like these as being compelled to act as they do. In this way, such cases lend credence to the common picture of addiction as involving some sort of compulsion.

2. However, from a certain perspective, the addict’s choice might not seem compulsive at all: He sees an opportunity to improve his hedonic condition, which he desires to do, and so he consumes drugs. Such choices may be unwise, but it is hardly news that human choices—even fully voluntary ones—can often be unwise. It is sometimes claimed that while the actions of

addicts may be irrational, they are not compelled. Such “deflationary” approaches to addiction (as we may call them) seek to explain the behavior of drug addicts in the same terms that other voluntary (but perhaps unwise) behavior is explained. Some deflationists claim that addiction is a voluntary and understandable (even if sub-optimal) reaction to bad external circumstances or mental health problems [2–4]. Other deflationists claim that “addictive desires are just strong, regular appetitive desires” for pleasure that should be regarded as *prima facie* autonomous [5, p. 14]. Still others claim that excessive drug use is irrational, but that it results from the same mechanisms that produce more ordinary forms of irrational behavior. In short, deflationary approaches argue that addicts consume not because of any compulsion, but simply because they want to; and if such consumption is irrational, its irrationality can be explained the same way that other forms of voluntary but irrational behavior are explained.

Deflationists often cite data showing that addicts modify their drug consumption in response to incentives as evidence that their behavior is voluntary. However, such data typically show only that *most* addicts abstain when given the incentive. Gene Heyman, for example, cites several studies in which addicted professionals (airline pilots and physicians) were subjected to drug tests, where testing positive would result in job loss. In these studies, 80 to 90% of the subjects successfully abstained. Heyman concludes that “when there are relatively immediate and salient consequences for reducing drug use, addicts comply” [6, p. 86]. But this conclusion ignores the most striking data in these studies—the fact that 10 to 20% of the addicts did not abstain *even though they knew that consuming threatened careers in which they had made great personal investment*. Fortunately, this subset of addicts appears to be small, but it is precisely the group whose behavior provides the most convincing case for the claim that addiction can be compulsive [7, pp. 132–135].

Some deflationists appeal to decision-making biases which are pervasive among humans. An influential version of this strategy has been developed by George Ainslie, who offers a mathematical description of the familiar observation that humans suffer from a temporal myopia that leads to choosing the sooner but lesser good over the later but larger one [8]. While temporal myopia certainly helps explain much of the drug consumption behavior of both addicts and recreational users, it is not clear that it can explain the apparent compulsivity

displayed by some addicts. Such explanations face a dilemma. Either humans all have similar patterns of temporal myopia, or they do not. If we are all equally temporally myopic, then the theory does not explain why recreational drug users consume in moderation, while addicts consume without restraint. But if we assume that addicts suffer from more extreme temporal myopia than non-addicted recreational users, we face a new dilemma. Either this abnormally strong temporal myopia is a global feature of addicts’ behavior, or it is restricted to drugs. The first possibility is tempting, since addiction is associated with other behaviors indicative of a failure to delay gratification (academic difficulties, petty crime, etc.). But the population of addicts also includes professionals who could not have built their careers with global impairments in the ability to delay gratification. On the other hand, if the deflationist claims that addicts only display abnormal temporal myopia with regard to drugs, it is no longer clear that claims about temporal myopia are doing any explanatory work, for one now wants to know why addicts are more myopic about drugs than other goods.

Although these remarks are unlikely to convince committed deflationists, they may perhaps suffice to motivate treating the apparent compulsivity of addiction as something to be explained rather than explained away.

3. Recently, philosophers Timothy Schroeder and Richard Holton have developed accounts of addiction that appeal to abundant and well-known scientific research about the effects of addictive drugs on brain systems connected with reward and motivation.

Schroeder’s account of addiction draws on his earlier work linking the concept of desire to neuroscientific findings about the midbrain dopamine-based reward system [9]. In particular, Schroeder notes that dopamine is released into this system when the organism acquires a reward—i.e., something that it wants or needs. This dopamine release strengthens the motivation to engage in the behavior that led to the reward. Ordinarily, repeated reward acquisitions from the same behavior result in less and less additional strengthening of the motivation to perform that same behavior. This mechanism prevents the motivation to engage in rewarded behavior from becoming so strong that it crowds out motivation to engage in other biologically necessary behaviors.

Schroeder argues that “to desire something is for one’s reward system to treat it as a reward” [10, p. 395; 11, pp. 76–70]. That is, desire is an entity produced by a properly operating reward system. Although desires typically produce motivation, Schroeder

maintains that motivation and desire are distinct, and that “it is possible in principle for people to have strong motivations without having strong desires” [10, p. 395]. Schroeder cites neuroscientific evidence that drugs trigger the release of dopamine into the reward system *directly*, bypassing the normal self-limiting mechanism which *normally* keeps repeated rewards from continuing to strengthen the motivation to engage in the behavior that produced them. Since Schroeder defines desire in terms of what the *normally operating* reward system treats as a reward, he claims that the motivation created by this abnormal bypassing of the reward system should not be thought of as a desire. Hence, Schroeder writes, “Insofar as they are moved by their addictions, they are moved by forces other than desires.” [9, p. 404]. In short, the addict’s *motivation* to consume is stronger than his *desire* to do so.

Richard Holton offers a philosophical account of addiction that rivals Schroeder’s in its neuroscientific sophistication. Holton’s view is based on a neuroscientific theory called “Incentive Saliency,” which has been put forward by Kent Berridge (with whom Holton has co-authored a key paper) and Terry Robinson. Robinson and Berridge [12] argue that motivation and pleasure are mediated by different brain circuits, which respond differently to chronic drug use. Chronic drug use *sensitizes the motivational system*, thus *increasing* the motivation to consume. By contrast, it *habituates the hedonic system*, thus *decreasing* the amount of pleasure that drug consumption produces. As Robinson and Berridge put it, the more of a drug that chronic users consume, the more they want it, but the less they like it.

Holton suggests that this dissociation between wanting and liking the drug makes the addict’s desire to consume insensitive to her beliefs about how much—if any—pleasure it will provide. Holton offers this analogy:

Standardly if someone wants something—a clever device for peeling garlic, say—and then discovers it does not work, the want will simply evaporate. It is, as we might say, *undermined*. In contrast, if Robinson and Berridge are right, in cases of addiction there must be an almost complete disconnection between judging an outcome good and wanting it, or, conversely, between judging it bad and not wanting it [11, p. 108f.; 13, p. 261].

According to the incentive saliency theory, an addict keeps wanting the drug even when it ceases to “work” to produce pleasure. This insensitivity to changes in belief

implies that over time the addict will experience a motivation to consume that is increasingly out of line with his or her beliefs about how pleasant consumption will be.

Abstracting from difference in detail—the relative merits of which I do not plan to adjudicate—Schroeder’s approach and the Holton-Berridge approach share a core idea. Addiction, on both views, involves motivations to consume that are abnormally strong.

4. But can the claim that addiction produces abnormally strong motivations to consume explain the apparent compulsivity sometimes displayed in addiction? After all, there is nothing particularly exotic about a person’s motivations being stronger than they should be given her beliefs. Most forms of garden-variety weakness of the will exemplify this phenomenon: My desire to eat donuts is stronger than it should be given my beliefs about the optimal balancing of the brief hedonic benefits versus the long-term health costs, to take a quotidian example. Although acting on a motivation that is stronger than it should be given one’s beliefs is typically akratic, it does not seem to be ipso facto compulsive. If I act on my overly strong desires for donuts, I do so akratically, but it would be hyperbole to call my behavior compulsive.

Of course, an abnormally strong motivation would be clearly compulsive if it was so strong as to be irresistible. But the suggestion that addiction-related desires are irresistibly strong does not fit the empirical facts about the behavior of addicts. Even those addicts who engage in extremely dangerous behavior routinely resist desires to consume, at least temporarily. A not-yet-intoxicated addict with a stash of cocaine or heroin will generally be able to resist the urge to consume while a police officer is nearby. Addicts who have developed tolerance sometimes deliberately reduce their consumption to “dial back” their tolerance. Yet if the addict’s desires to consume drugs were irresistibly strong, then such things would be impossible.

5. Perhaps a distinction will help. On what we might call the strong, or “face value” understanding, a desire is irresistible at time *t* if it is so strong that the agent is unable to resist it at *t*. But we might follow James Stacey Taylor in distinguishing a weaker notion of irresistibility, according to which a “weakly irresistible” desire is one which “the agent who is subject to it must eventually satisfy (unless he takes steps to ensure that he is unable to satisfy it

owing to his subjection to a more powerful force of either internal or external origin), but that he need not satisfy every time he is subject to its promptings" [14, p. 243].

A number of recent philosophical accounts of addiction have appealed to weaker understandings of irresistibility like the one suggested by Taylor. Some of these [15–17] appeal to a psychological theory called "ego depletion." This theory, developed by Roy Baumeister, Dianne Tice, and colleagues [18], holds that willpower is a limited resource that is depleted when used. The key empirical finding that motivates this theory is that temptation becomes progressively more difficult to resist as the time during which it must be resisted increases.

As Neil Levy observes, ego depletion theory explains why addicts consume against their better judgment without the implausible assumption that their desires to consume are strongly irresistible at any given instant: Because addicts can resist for a time, they can often abstain temporarily. But because the ability to resist fails over time, in the long run addicts often "engage in illegal, dangerous or degrading activities in order to procure their drug, they lose their jobs, their partners, their homes" [16, p. 17].

It is worth noting that ego depletion theory claims that a single reservoir of will-power is employed for a huge variety of tasks thought to require any form of self-control. Thus, it predicts that resisting the temptation of a plate of cookies will degrade that person's performance in a wide variety of tasks thought to involve self-control, from solving math puzzles to donating money to charity. This particular aspect of the ego depletion theory has recently been called into question [19]. However, these criticisms do not apply to the more basic finding that exerting self-control of a single type—say, resisting a persistent impulse to use drugs—becomes progressively more difficult as time passes. And this finding is all that is required to vindicate the idea of weak irresistibility.

6. There is no need to pit the ego depletion account against the abnormally strong motivation account of addiction. Presumably, it is more taxing to resist a strong desire than a weak one, so the factors pointed to by strong motivation accounts will also make it more difficult for the addict to resist in the long run. However, in order to do any explanatory work, the ego depletion/weak irresistibility account must assume that the desire to consume the drug persists long enough to wear down the addict's ability to resist temptation.

The persistence of addiction-related desires is sometimes noted in the literature [15, 20, 21]. However, I think that recent accounts of addiction understate the abnormality of the persistence of addiction-related desires. I suggest that addiction can involve desires with an extraordinary form of persistence which separates them from the desires driving more ordinary irrational behavior, and which helps account for the apparent compulsivity of some addicts' behavior.

7. To develop this suggestion, I'll start with a common observation about how desires operate: A person who desires that *P*, and believes that *A*-ing would be conducive to *P*'s obtaining, typically becomes motivated to *A*. David Hume makes an equally important, but less often noted, observation:

The moment we perceive the falsehood of any supposition, or the insufficiency of any means our passions yield to our reason without any opposition....I may will the performance of certain actions as means of obtaining any desired good; but as my willing of these actions is...founded on the supposition, that they are causes of the proposed effect; as soon as I discover the falsehood of that supposition, they must become indifferent to me [22].

More formally, when an agent's motivation to *A* arises from her desire that *P* and her belief that *A*-ing is conducive to *P*'s obtaining, then it typically disappears if she abandons her belief that *A*-ing is conducive to *P*'s obtaining. So, in addition to a mechanism whereby we (typically) become motivated to do what we think is conducive to bringing about states of affairs that we desire, we also seem to have a mechanism whereby such a motivation is, let us say, "*quashed*" if we discover that the belief on which it is based is false. Holton's garlic peeler example is a case in point.

It is important to emphasize that what gets quashed is the motivation to *A*, not the desire that *P*. Suppose that I want some Guinness and I believe that the corner store has it, so I become motivated to go to the corner store. If I learn from a friend that the store does not carry Guinness, and if I have no other reason to visit that store, then my motivation to go there will dissipate. But this will be unlikely to change my desire for Guinness. Notice also that this quashing requires no conscious decision or effort—as Hume says, it occurs "without any opposition." Once I learn of the Guinness-free state of the store, I don't have to resist the motivation to go there now; it vanishes on its own.

The quashing Hume discusses happens when the agent abandons a belief about the conduciveness of *A* to something the agent wants. However, I think that quashing also happens in other kinds of situations as well. Consider these:

- Christopher Cherniak tells this story: “Smith believes an open flame can ignite gasoline...and he believes the match he now holds is an open flame... and Smith is not suicidal. Yet Smith decides to see whether a gasoline tank is empty by looking inside while holding the match nearby for illumination” [23, p. 57]. Suppose that, just in time, Smith realizes what he’s about to do. We would expect his motivation to strike the match to vanish immediately.
- I was hurriedly driving home from an errand and wanted to get through an intersection before the signal changed. Suddenly, brake lights on the vehicle in front of me announced that it was stopping. Just as suddenly, my motivation to enter the intersection vanished.
- Last summer, I was overdue for a new computer. One day, I was working in the nearly-deserted university center when a stranger asked me to “guard” her new computer while she went for coffee. Although I could easily have taken the computer, I felt no temptation to do so. I gather that most people are not seriously tempted to steal desired items from stores. If the temptation to take a “five-finger discount” arises at all, it usually dissolves before we have to spend much effort to resist it.
- In a classic study on Obsessive-Compulsive Disorder, Stanley Rachman and Padmal de Silva [24] found that most people occasionally experience impulses to harm another person, to shout something inappropriate, to crash one’s car, or to jump from a precipice. Interestingly, the respondents reported that these impulses normally go away on their own, usually in a few seconds or, at most, a couple of minutes. These findings have been confirmed by follow-up studies.

Taken together, these data support the hypothesis that motivations to do something disastrous, repugnant, or otherwise unacceptable are typically quashed, either before or soon after impinging on the agent’s consciousness.

To describe this phenomenon more precisely, let us define a “proximal motivation to *A*” as a motivation to

perform or begin performing a token of action type *A* *right away*.¹ Not all motivations are proximal. For example, I have a non-proximal motivation to visit Greece someday, but I have a proximal motivation to take a sip of coffee right now. Often, the object of a proximal motivation will be an act which the agent regards as an apt means to achieve some desired state of affairs. Thus, Smith’s proximal motivation to strike the match arose from his desire that the inside of the gas tank be visible, together with his belief that striking a match is a way to make things visible.

It is important to emphasize that quashing may affect a proximal motivation while leaving intact the desire from which it arose. Thus, Smith may still want to see into the tank even after the proximal motivation to strike the match is quashed; I still wanted to go home from my errand quickly after the proximal motivation to continue forward into the intersection was quashed; I still wanted a new computer despite the quashing of any motivation to steal one.

One might suggest that, rather than being quashed, the proximal motivations in these examples simply get outweighed by stronger desires. However, this suggestion doesn’t pan out. Consider what happens when a proximal motivation loses the motivational tug-of-war with another desire. When my health-related desires overcome my proximal motivation to eat another donut, the donut-eating motivation typically does not go away quietly. Instead, it continues to exert a motivational force on me, which I experience as a temptation to reverse my decision. But this is not what happens in cases of quashing. Once Smith realizes what he is about to do, we would expect him to be free of any temptation to strike the match anyway. Once I saw brake lights, I was not tempted to keep going anyway. The subjects in Rachman and de Silva’s studies were not tempted to act on the repugnant impulses once they went away. In short, when a proximal motivation is quashed, it leaves

¹ I prefer “proximal motivation” to “proximal desire,” since the former specifies that the state I have in mind motivates action. The term “desire,” (along with similar terms like “want”) may refer to either a motivation to act or to an agent’s pro-attitude toward a state of affairs. In some contexts—especially where the object of the mental state is a state of affairs rather than the taking of an action, or where less specificity is required—I will use the term “desire.” Thus, I call Smith’s attitude toward the state of affairs in which he sees into the gas tank a desire, but I call his being moved to strike the match a motivation. Thus, in speaking of “proximal motivation” rather than “proximal desire,” I do not mean to draw the distinction between desire and motivation that Schroeder draws.

no motivational residue in the way that we expect when a proximal motivation is overpowered by a stronger desire.

Similarly, quashing is very different from resisting temptation through the deliberate exercise of willpower. Imagine what it feels like to resist the urge to eat a nearby donut. Now imagine finding out that all of the available donuts were adulterated with rat droppings. My guess is that you will have no trouble refraining from eating those donuts—the proximal motivation to eat them will simply vanish with no effort on your part. Although one may have to resist a proximal motivation briefly before it is quashed, the quashing process itself does not require the same sort of effort that resisting a proximal motivation would require; indeed, the quashing process seems thoroughly automatic. Resisting a proximal motivation takes effort, but when a proximal motivation is quashed, there is nothing there to resist.

The foregoing considerations support the claim that humans possess a mechanism that quashes the motivation to perform actions that the agent regards as disastrous or repugnant. This quashing mechanism is commonly triggered by prospects the agent regards as serious threats to herself and/or her most important interests and deepest concerns. Prospects that trigger the quashing mechanism are prospects that would keep a person up at night with worry, self-loathing, or shame. This mechanism may prevent the formation of a motivation altogether, or it may extinguish the motivation soon after it impinges on the agent's consciousness. Moreover, this process is distinct from the process by which motivational conflicts are settled in favor of the stronger desire, and it is distinct from resisting a desire or other deliberate processes of self-control. Although this mechanism often yields the same overt behavioral results as successful attempts to resist a desire, the two mechanisms (and their associated phenomenology) are very different.

The existence of a quashing mechanism that operates on motivations to do things that would normally cause the person to feel fear, anxiety, or disgust is likely a reflection or development of evolutionarily old systems that dampen motivation, as when the fight or flight response dampens the motivation to engage in feeding or reproductive behavior, or when visceral disgust eliminates feelings of hunger. Emotions like fear, anxiety, and disgust were originally connected to threats to survival. But modern humans are apt to experience fear and

anxiety toward threats to their careers, their liberty, and their social connections, while something like disgust can be triggered by the thought of violating a deeply engrained moral principle.

Like most psychological mechanisms, even an intact quashing mechanism can be defeated. Self-deception or distraction may prevent the system from recognizing a threat and triggering the process of inhibiting the relevant proximal motivation. Sometimes, extreme conscious effort can override the quashing mechanism: The lost hiker who must sever his trapped arm in order to survive might be able to force himself to overcome the normal loss of nerve that occurs when the quashing mechanism seeks to quash the proximal motivation to start cutting.

8. The most extreme addiction-related behaviors—and those most suggestive of compulsion—occur when addicts consume drugs in situations where such consumption poses a grave, obvious, and imminent danger to things that they care about—things like their careers, their family, their health, their freedom, their self-respect. For short, let us call these “D-type situations.” The puzzle of extreme addiction, then, is why some addicts sometimes consume even in D-type situations.

The men in our opening vignettes fit this description: Being on a work release from jail and subject to drug tests would be a D-type situation, as would drinking before driving to a place where police are investigating an accident. But there are even more extreme examples. In Russia a drug called “Krokodil” is reportedly quite popular, despite the fact that impurities in its manufacture commonly cause the flesh around the injection site to die and rot, so that “the average user...does not live longer than 2 or 3 years, and the few who manage to quit usually come away disfigured” [25]. In the wake of the fatal heroin overdose of actor Philip Seymour Hoffman, it was reported that many heroin addicts were not only undeterred by such overdoses, but some even sought out the specific “brand” of heroin involved, due to its apparent potency [26]. Such cases invite the thought of compulsion precisely because they involve agents consuming in situations where consuming is courting disaster—whether it is death or disfigurement, or the loss of one's career, family, or freedom.

It is true that non-addicted recreational drug users sometimes consume in D-type situations. But as a rule they don't do this nearly as often as addicts—otherwise the consequences would eventually catch up with them and they would fit the classic profile of the genuine

addict who wrecks his life in pursuit of drugs. What explains why addicts consume in D-type situations frequently enough to wreck their lives, while recreational users generally avoid consuming in those situations?

Although some drug use may have an automatic or habitual component (e.g., absent-mindedly lighting a cigarette), the majority of behavior involved in acquiring and consuming drugs consists of voluntary actions. Since voluntary actions are motivated, we can surmise that addicts are often *motivated* to consume drugs in D-type situations. When the addict consumes in a D-type situation, it is typically because she *wants* to. How is it, then, that non-addicts avoid consuming in (most) D-type situations? There appear to be two main possibilities:

- (1) Non-addicted users form proximal motivations to consume in D-type situations about as often as addicts do, but non-addicted users are better than addicts at resisting those proximal motivations.
- (2) Non-addicted users usually don't experience anything more than a fleeting proximal motivation to consume in D-type situations, even though they may be proximally motivated to consume in other situations.

Impairments to the ability to resist temptation referenced in the first hypothesis probably play a role in explaining addiction, since there is empirical evidence that addicts often have somewhat impaired abilities to engage in conscious, deliberate self-control [27]. But as we noted above, there are good reasons not to appeal to global deficits in self-control as the main explanation for addiction. I contend that the second possibility both explains a good deal of addiction-related behavior and distinguishes it from the sometimes weak-willed overconsumption by non-addicted recreational users. In other words, I suggest that, for most recreational users most of the time, proximal motivations to consume in D-type situations are quashed. Recreational users sometimes want to consume drugs, but they are typically not proximally motivated to do so in D-type situations.

I draft this passage at 2:00 p.m. on a Wednesday. I am working at home; in about 2 h, I'll drive to retrieve my children from school. Half a bottle of Jack Daniels whiskey sits twenty feet away in the cabinet. Why am I not drunk right now? I like drinking whiskey, and there is more than enough of it to produce a very pleasant hedonic state, and I have a standing desire for pleasant

hedonic states. Yet I have no discernible motivation to drink the whiskey, and certainly no motivation to drink enough of it to become inebriated. Here is what is *not* happening: I am not resisting a desire to break open the whiskey. But why not? I am aware of an opportunity to improve my hedonic condition, and I have a standing desire to improve my hedonic condition. Yet I feel no discernible temptation to spend the afternoon getting drunk. If I were tempted, then perhaps my powers of self-control would suffice to enable me to resist. But as much as I might like to think otherwise, my powers of self-control are average at best. If I really were tempted to open the whiskey, I'm not sure that they would be up to the task. It is therefore quite fortunate that I feel no particular temptation to drink, and thus I am not forced to deploy my powers of self-control in a battle they might not win. I suspect that if I were an extreme alcoholic, things would be quite different, and maintaining sobriety right now would require an act of will that I am spared having to undertake. Although the consequences I would face from getting drunk this afternoon are not as disastrous as the ones my neighbor faced for his use of oxy, they are apparently enough to quash any significant temptation to drink to inebriation.

Of course non-addicts sometimes do consume in D-type situations. Sometimes, through inattention, recklessness, self-deception, or honest error, they fail to realize that they are in a D-type situation. (No doubt this happens to addicts as well.) But when non-addicts are in D-type situations, they usually realize it, and they usually do not consume. And if my experience is typical, this isn't because of super-human powers of self-control, but rather because most of the time they simply face little if any temptation to consume.

Many people keep liquor in their homes without being constantly tempted to drink. Most bartenders routinely work their shifts without getting drunk. Most pharmacists forgo sneaking into the back room to snort oxy. Most DEA agents don't consume the drugs they seize. Given how bad humans are at resisting temptation, it would be remarkable if these phenomena represented feats of deliberate self-control. It seems more likely that for these non-addicts, most of the time, consuming in a D-type situation just isn't particularly tempting.

The conclusions so far suggest the following hypothesis: Addiction involves impairment to mechanisms that normally quash the proximal motivation to consume the drug in D-type situations. The addict, like most people,

has a standing desire to improve his current hedonic condition. When he becomes aware of an opportunity to do that by consuming a drug (opportunities that addicts appear to be particularly apt to notice, by the way), this awareness combines with the standing desire to create a proximal motivation to consume the drug. When this happens to a non-addict, and she recognizes that she is in a D-type situation, the quashing mechanism will usually either block the formation of the proximal motivation to consume, or eliminate it soon after it forms.² By contrast, the addict's proximal motivation to consume drugs often persists even when it is (or should be) obvious that consumption invites dangerous or repugnant consequences.³ This persistence sometimes wears down the addict's willpower, so that she often succumbs to this temptation.

Presumably there is more to say about the process whereby someone with depleted willpower succumbs to persistent temptation. Sometimes giving in may be a purely volitional, almost hydraulic, matter, like a persistent itch finally overwhelming the power to resist. In other cases, it may involve a shift in belief or judgement, where the person reasons—or rationalizes—that consuming would not be so bad after all, or that it would be worth whatever consequences ensue.⁴ Such a belief change might be sincere, even if it is caused by the persistent motivation rather than changes in the facts of the situation. Moreover, drug-related impairments to capacities

involved in identifying danger, predicting consequences, judging likelihoods might make the addict less certain than she should be that she is in a D-type situation, and this may help to tip the balance in favor of deciding that the benefits of consuming outweigh the risks.

9. Philosophical accounts of addiction—like those of Schroeder and Holton—that characterize addiction in terms of abnormally strong motivation appeal to a large neuroscience literature about the effects of addictive drugs on the brain's reward centers. Since the quashing account is meant to supplement rather than replace the strong motivation account, it is at home with those well-known findings. But the quashing theory also makes contact with another set of scientific findings that are less well-known among philosophers. These findings suggest that long-term use of addictive drugs can impair brain systems responsible for inhibiting previously rewarded behaviors that have now become inappropriate. The ability to inhibit such “pre-potent” behavior is commonly measured by laboratory tasks like the go/no-go task (where subjects are first trained to produce a certain behavior, and then required to withhold that behavior in response to a signal) and the stop signal reaction time task (where subjects are required to cancel a behavior that they have already begun to initiate). Deficits on such tasks among addicts are well-documented [29], and imaging studies show that addicts often display abnormalities in brain areas—such as the orbitofrontal cortex and the right inferior frontal gyrus—involved in these inhibition tasks [27].

Since quashing is a form of inhibition of a previously rewarded behavior that has now become inappropriate, the fact that addicts often display measureable deficits in the ability to inhibit such behavior is suggestive. Unfortunately, current findings about inhibitory deficits do not tell us whether these deficits involve processes that automatically suppress motivation to emit the now inappropriate behavior, or processes whereby a person consciously resists such a motivation. However, there is some evidence that these inhibitory processes are at least sometimes automatic and effortless [30]. While not definitive proof of the quashing account of addiction, these studies suggest that the inhibitory mechanisms known to be impaired in addicts sometimes operate automatically and without effort, and thus in ways that more closely resemble quashing than conscious resistance of temptation.

Moreover, research on craving suggests a link between response-inhibition deficits in addicts and

² Of course, some people never form a proximal motivation to consume drugs, even in non-D-type situations. For some people, differences in physiology or experience may attenuate the extent to which a given drug really does improve their hedonic condition. Others are so put off by certain aspects of the use of some or all drugs for moral, religious, or aesthetic reasons that they do not regard them as ways to improve their hedonic condition. Others may believe that drug consumption is likely to have a net negative effect on their hedonic condition. Consequently, many people will not become motivated to consume drugs in response to a desire to improve their hedonic condition. Such people do not create the central puzzle addressed in this paper, namely, why some people do become proximally motivated to consume drugs *in non-D-type situations*, while others become proximally motivated to consume drugs *even in D-type situations*.

³ Numerous findings about cognitive impairments associated with long-term drug use [27] suggest it can impair reasoning capacities involved in identifying danger, predicting consequences, judging likelihoods, and so on, which are central to being able to determine whether one is in D-type situation. Thus, addicts may be less likely than non-addicts to recognize D-type situations when they are in them.

⁴ The role of judgment shifts in addiction and other irrational actions is emphasized by Holton [11] and Levy [28].

differences in the extent to which addicts experience motivation to consume. Although craving is sometimes described as including intrusive thoughts akin to an obsession, it is almost always described as being or at least including the motivation or urge to consume. It is often triggered by stimuli associated with prior drug use (“cue-induced craving”), and in addicts, it tends to be especially strong in the presence of a perceived opportunity to consume [31]. In other words, cravings often fit the description of proximal motivations. Interestingly, addicts with impaired response inhibition have been shown to experience higher levels of craving than recreational users or users without significant inhibitory deficits [32–34]. Such findings suggest that one function of these inhibitory processes is to reduce the extent to which a person craves the substance. This in turn suggests that some addicts suffer impairments in brain processes tasked with reducing the extent to which they experience the (often proximal) motivation to consume drugs—just as the quashing account predicts.

One particularly interesting craving study [35] involved alcoholics treated with disulfiram, a drug that produces severe nausea and illness if alcohol is consumed. The study found no decrease in the urge to drink alcohol “right away” among the alcoholics, despite the fact that they knew that drinking right then would produce severe gastric distress. This is striking, since the prospect of severe gastric distress typically suffices to make one unmotivated to consume the source of that distress. Yet in these addicts, the motivation to consume persisted—just as the quashing theory predicts.

Certain animal studies also provide some support for the quashing theory. Several studies have shown that a subset of rats subjected to long-term drug use lose the ability to inhibit drug-acquisition behaviors when those behaviors become subject to punishments (e.g., foot shocks or administration of nausea-inducing substances) [36]. Of course, it is possible that the punishment-resistant rats are so strongly motivated to consume the drug that they are willing to endure punishment in order to get it. Although there is some debate in the literature about whether punishment-resistance always co-occurs with heightened motivation to consume the drug, some studies appear to demonstrate that some rats can develop punishment-resistant drug-acquisition behavior without becoming significantly more motivated to consume the drug [37]. If those results are valid, then it appears that a subset of rats exposed to long-term drug consumption display an impairment in the ability to withhold drug-

consumption behavior that is not explained simply by extremely strong motivation to consume. This would provide some *prima facie* support for the quashing theory for two reasons. First, it is rather implausible to regard the punishment-resistant rats as displaying deficits in the ability to consciously resist the motivation to consume in the face of punishment, since it is implausible to suppose that rats have such sophisticated cognitive abilities to begin with. Rather, it is more plausible to regard the impairment as affecting processes that automatically inhibit motivation in the face of punishment. Second, since evolution seldom throws anything away, if rats have non-conscious processes that automatically suppress motivation to engage in punished behaviors, it is plausible to suppose that these processes are preserved in humans.

It is important to avoid overselling this evidence: Nothing here constitutes a “smoking gun” that proves the quashing theory. However, taken together, these findings do provide at least circumstantial evidence for the claim that the normal human brain is capable of automatically and non-consciously suppressing motivation to engage in previously appealing but now inappropriate behaviors, and that impairment to this capacity can help to explain extreme addiction-related behaviors.

10. On the “impaired quashing” view, the addict acts on a proximal motivation that arises from the desire to improve her current hedonic condition and the belief that drugs will accomplish that. But what makes addiction a dysfunction is that this proximal motivation persists in situations where it would normally be quashed. The addict consumes to the point of disaster because her motivation to consume—unlike that of the non-addict—often goes unquashed in situations where acting on it invites disaster. Nothing in this theory suggests that the addict is subject to motivations that are irresistible in the stronger sense of the word. Rather, it suggests that the key problem in addiction is the persistence of the motivation to consume drugs even when doing so threatens dangerous or repugnant consequences.

Whether or not all of the details of the ego depletion theory are correct, it seems safe to claim that a strong motivation that persists for a long time becomes progressively more difficult to resist. Consequently, in the long run, those who must resist a ruinous motivation will tend to be less successful than those for whom the same motivation is simply and effortlessly quashed. In a D-type situation, the non-addict seldom needs to employ willpower for more than the short time it takes for the

proximal motivation to consume to be quashed. But for addicts, the proximal motivation to consume may persist even if she recognizes that consuming then and there invites disaster. The motivation's persistence exerts a continuous motivational pull toward disastrous consumption. The fact that the ability to resist such a pull is finite implies that, over time, persistent motivations tend to get acted upon, even if they are not irresistible in the strong sense.

In any given D-type situation where the addict is tempted to consume, she might manage to resist the proximal motivation to consume the drug for a while. Sometimes, her resistance will suffice long enough to outlast the D-type situation or the availability of the drugs therein, especially when the stakes are high enough to motivate strong efforts at self-control. Consequently, addicts will often pass through D-type situations without consuming. (And thus, their overall consumption will display some sensitivity to incentives.) However, if the addict with an impaired quashing mechanism remains in the D-type situation long enough, and if the drug remains available, then her resistance will often give out. The non-addict, by contrast, is in a much better situation, since the motivation to consume in a D-type situation is likely to be quashed before or soon after it appears, so that she will not have to expend much effort to resist it.

It is worth noting that the phenomenon of limited willpower also supports my earlier speculation that the reason why non-addicted bartenders, DEA agents, pharmacists, and people who keep liquor in their houses are able to abstain from consuming available drugs is that any proximal motivation to do so is quashed. If the power to resist temptation really is limited, then someone who spends a lot of time around drugs or alcohol—even in D-type situations—should not be able to resist the proximal motivation to consume *if it persists*. Something, it seems, must prevent the proximal motivation from persisting (or from forming at all). The fact that the non-addict's proximal motivation is quashed enables her to avoid consuming drugs in D-type situations (especially ones where the availability of the drug is impossible to ignore) without depleting her willpower. The addict, on the other hand, is likely to find her willpower overwhelmed by a persistent, unquashed proximal motivation to consume in such situations.

11. On the view I am suggesting, the apparent compulsivity of addiction is a product of three main facts: First, due to the effect of chronic drug use on the

dopamine-based reward system, the addict experiences a motivation to consume drugs that is abnormally strong, though not so strong as to be strongly irresistible. Second, these abnormally strong motivations to consume often fail to be quashed, so that the addict continues to be tempted to consume even in situations where doing so poses a high risk of disaster. Third, the ability to resist a persistent motivation—especially a strong one—is limited.

This makes the addict's predicament very different from the situation most of us face most of the time. Although the non-addict suffers from the same inability to resist strong temptation indefinitely, an intact quashing mechanism guarantees that, by and large, she will not face persistent temptations to do things that she knows are spectacularly self-destructive. Although non-addicts sometimes do spectacularly self-destructive things, this is more often a result of ignorance or self-deception that prevents her from seeing the likely consequences of her actions. Addicts also suffer from this problem, perhaps even more than non-addicts do. But on the view on offer here, addicts may continue to face temptation to consume even when they consciously realize that consumption threatens unacceptable consequences.

It is not for nothing that the familiar prayer includes a request not to be led not into temptation. Addiction, it appears, leads its victims into persistent temptations that non-addicts seldom face for more than an instant. Given the limitations to human willpower and the abnormal persistence of the motivation to consume despite dire consequences, it is no wonder that addicts sometimes give in and do things so disastrous that they seem compulsive.

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