How Neuroscience Predicts The Spontaneous Remission Of Addiction

What Is Spontaneous Remission Of Addiction?

Standard addiction treatment programs and 12 step fellowships like Alcoholics Anonymous have promoted the view that addiction is a chronic progressive disease which always gets worse and can never be cured except through a treatment program or a lifelong membership in a 12 step fellowship like AA or NA. However, the fact is that the research evidence tells us that the opposite is true. The "hijacked brain" model of addiction was created to explain this erroneous assumption that addiction is a chronic and progressive disease; many people in the addictions field sincerely believe that this assumption is true. But the reality is that the normal outcome of addiction is for people to overcome it on their own, without a rehab program, and without a twelve step group. The "hijacked brain" model is simply wrong.

NESARC (the National Epidemiologic Survey on Alcohol and Related Conditions) is the largest survey study of Alcohol Use Disorders ever conducted in the US. NESARC was conducted by the NIAAA (National Institute on Alcohol Abuse and Alcoholism) which is a US government agency. NESARC found that three fourths of all people with Alcohol Dependence (what lay people call "alcoholism") overcame it and that of those who overcame it, three fourths did it on their own, without AA, and without any rehab or treatment program (NIAAA 2009). Only one fourth did not get better.

Experts generally agree (New York Times 1994) that cigarettes are the single most difficult addiction to quit, even more difficult than heroin , yet the CDC (CDC 2004) tells us that there are now more ex smokers than current smokers: most people eventually overcome addiction to cigarettes and most people do it on their own (Peele 1991). Studies of heroin addicts also tell us that the majority recover on their own without rehab or the 12 steps (Winick 1962; White 1996). In fact, there is not adequate evidence that people who go to rehab or 12 step groups are more successful at overcoming addictions than those who do it on their own (Fletcher 2013).

The good news is that is the majority of people will overcome addictions on their own, regardless of what they are addicted to. The bad news is that while some people may kick addictions fairly quickly, for other people they can last a long time; it can take ten or twenty years or more for some people to decide to kick an addiction, whether they go to rehab or not.

The data tell us that the older you are the more likely you are to quit an addiction. Moreover, the older you are the less likely you are to take up an addiction. The NESARC data illustrated in Figure 1) below show that addiction is directly age-related (NIAAA 2008). Addictions decline with age because people quit them on their own--only a tiny minority of people with an addiction die from it or overcome it via addiction treatment.

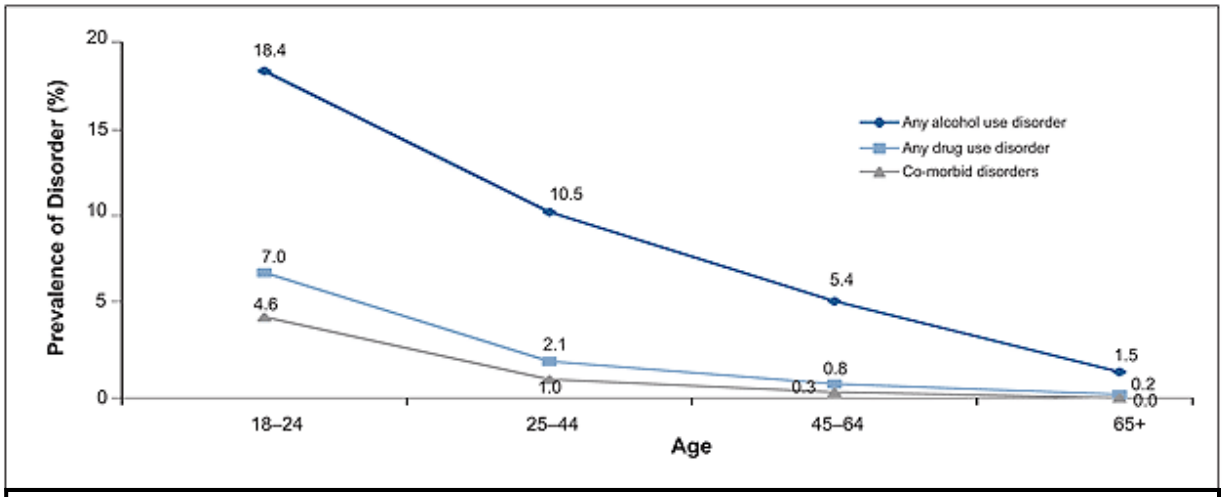

Figure 1)

The NIAAA cross sectional data presented in Figure 1 is also confirmed by longitudinal studies. Clark's (2004) study of the natural history of adolescent alcohol use disorders found that about half of adolescents with an alcohol use disorder matured out of it by adulthood and that the majority did so by cutting back on drinking rather than quitting. Chen and Kandel's (1995) longitudinal study of adolescent drug users found that the majority had ceased using illicit drugs by adulthood.

When people quit addictions on their own without rehab or AA, researchers call this "spontaneous remission." "Spontaneous remission" is a very misleading term because it is anything but spontaneous. Overcoming an addiction requires a hell of a lot of hard work and often there are slips on the path to finally kicking your bad habit for good. Addictions are overcome by making a voluntary and conscious effort, by making decisions, and by making plans for how to overcome them. Willpower alone probably won't cut it. But willpower combined with plans, tools and strategies will. You need not look for a cure outside yourself in a magic pill, a magic rehab, or a magic 12 step group, rather, look within to your own resources.

"Spontaneous remission" is also sometimes referred to as "maturing out" of an addiction. Maturity is an important factor in overcoming an addiction as well as in not getting addicted in the first place. As we shall see below, youthful brains are associated with a lot of risk taking and more mature brains are far more risk averse. Most people who start smoking cigarettes do it in their teens when they still believe that they are immortal; very few have their first cigarette after the age of 30. Neuroscience helps explain this. Most people who are addicted to something also decide to quit the addiction when they get older and once they have decided to quit their addiction are able to do so successfully without treatment or rehab. Neuroscience also helps to explain why this is so.

The Un-hijacked Brain

In recent years a neurobiological explanation of addiction has arisen which explains how addictive chemicals like heroin or cigarettes and addictive activities like gambling or videogames hijack the reward system of the brain by causing the release of dopamine in the nucleus accumbens, a part of the limbic system. The limbic system feeds into the prefrontal cortex in ways which we will discuss later. This model is actually very good and accurate so far as it goes; however, it makes the wrong predictions about how addictions work because it is incomplete. This model predicts that addictions will be progressive and lead the addicted individual to continue to pursue ever larger quantities of drugs or addictive behaviors until death ensues. Whereas, as we have seen, the opposite is the case, and the normal outcome of addiction is to overcome it as one matures.

What is wrong with the neuroscientific explanation of addiction given above is that it is incomplete; it assumes that there are no other neurochemical processes taking place in the brain except for the addictive process. The dopamine system in the nucleus accumbens gets hijacked by the addictive substance or activity and the entire rest of the brain is in stasis until death. The reality is that there are ten zillion different other neurochemical processes going on in your brain which are in competition with this addictive process. Moreover there are neurochemical and neurobiological processes involved in maturing from adolescence to adulthood and from adulthood to old age which make addiction less and less attractive the older one gets

There is a tug of war going on between the addicted brain circuits which find the addictive substance or behavior to be attractive, and the rest of the brain, which as it matures grows steadily more risk averse and steadily less attracted to the addiction. This is one important neurobiological factor which helps explain why as people grow older they become more likely to quit their addictions--with or without help. Most quit without help. Other neurobiological factors, as well as the sociological and environmental factors are also of great importance in the process of maturing out of addiction. These factors help to account for the NIAAA data illustrated in Figure 1) above.

As one gets older, both environmental and neurochemical factors militate against addiction. Peele has frequently noted environmental factors such as graduating from college, getting a full time job, a spouse, and children are factors which lead the majority of party-hearty collegiate substance users to give up their heavy involvement with substances and either abstain or become moderate users.

In addition to these environmental factors there are distinct physiological and neurochemical changes which take place in the brain as people age which make them more risk averse and make problematic substance use less and less attractive the older one gets. Research we will examine below clearly demonstrates that adolescents engage in the most risk taking behaviors, that adults are more risk-averse than adolescents, and that old people are the most risk-averse of all.

Adolescence To Adulthood To Old Age--Maturity And Risk Avoidance

Research shows us that people become progressively more risk averse with age. Dr. Julia Deakin and her research team had 177 subjects aged between 17 and 73 take part in a computer based gambling task and found that risk taking behaviors decreased in proportion to the age of the subject (Deakin, 2004). Neuroscience can help to account for this change in behavior by tying it in with changes in the brain which occur throughout the lifespan. We will first look at the transition from childhood to adolescence to adulthood.

Young children are quite risk avoidant. The onset of puberty brings with it a huge increase in risk taking behavior which is hypothesized to be a survival mechanism which leads to the separation of the adolescent from the parents and mating. This increase in risk taking behavior is intimately connected to a complete remodeling of the brain which occurs at this age period.

Our brains undergo a huge reorganization between the ages of 12 and 25. Axons become more insulated with thicker coatings of myelin. Heavily used synapses grow stronger while little used synapses wither away and disappear. A wholesale synaptic pruning takes place resulting in the loss of a great deal of gray matter: approximately 50% of neurons are lost between birth and age 25 (Low et al 2006). But this is actually good news because after this pruning is finished around age 25 the brain is much faster, more compact and more efficient and the prefrontal cortex, the seat of reason and judgment, becomes fully developed. This 25 year old brain is capable of good impulse control and mature decision making. Figure 2 illustrates this loss of gray matter which occurs between the ages of 5 and 20--cooler colors mean fewer neurons.

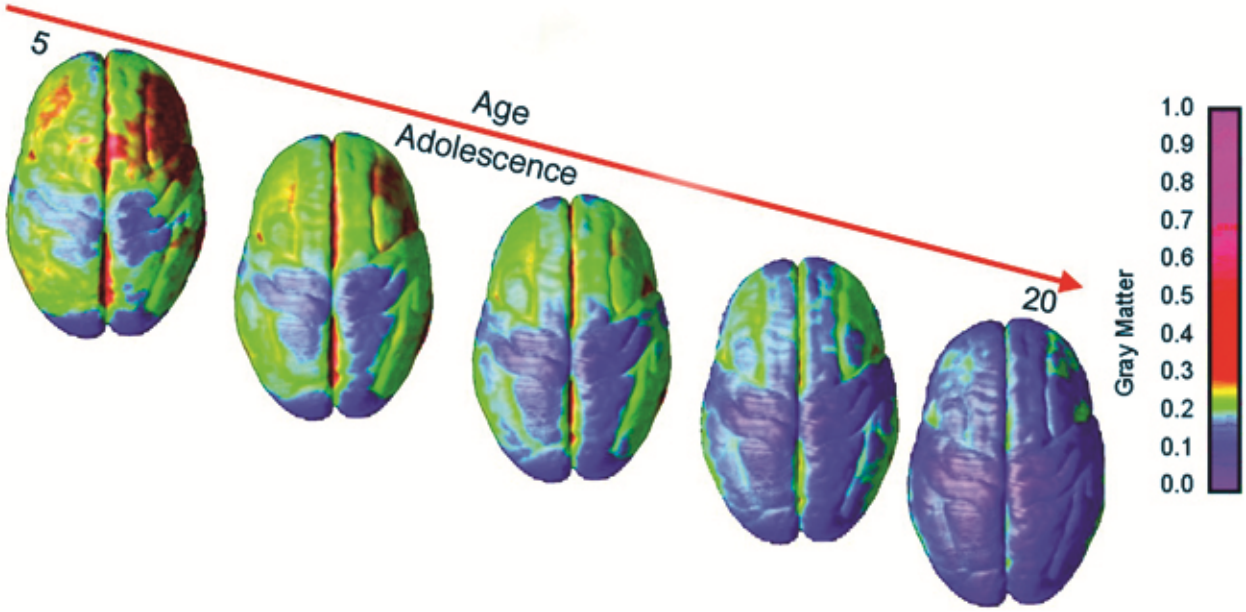

Figure 2) Synaptic Pruning

All of these changes in the brain render high risk behaviors such as heavy drinking or shooting heroin far less attractive to the mature brain of the 25 year old than they were to the sensation-seeking adolescent brain of the 16 year old.

Dr. Laurence Steinberg and colleagues (2008) studied 935 subjects between the ages of 10 and 30 and found that scores on sensation-seeking, risk preference, and reward sensitivity peaked between the ages of 13 and 16 and began to fall off thereafter. A Delay Discounting task was used to measure preference for short term rewards; it was found that preference for short-term rewards was greatest among the 12- to 13-year-olds. The Delay Discounting task compares the preference for a small reward which is delivered immediately to a large reward which is delivered after a delay. Most neuroscientist agree that it is the development of the mature prefrontal cortex which accounts for the empirical evidence of decreased risk taking found in experiments like Dr. Steinberg's.

Next let us look at some brain and behavioral changes which take place between adulthood and old age. fMRI studies have shown us that when people make a risky decision instead of a safe one there is more activation of the right insula of the brain (Paulus 2003). Moreover, the more risk-averse and harm avoidant a person is, the greater the activation that can be seen when this person make a risky choice. High activation of the right insula while making a risky choice is a neurobiological marker of a risk averse person. Low activation of the right insula while making a risky choice is a neurobiological marker of impulsive high risk takers. Impulsivity and risk taking are also characteristics which are associated with substance abuse.

Dr. Tatia Lee and colleagues performed an experiment to measure the activation of the right insula of a group of younger subjects (12 subjects, average age 30) compared to a group of older subjects (9 subjects, average age 65) during a risk taking task using fMRI. The task involved picking numbers which were flashed on a computer screen. The number 20 was always a safe choice and gained the participant 20 points. The numbers 40 and 80 were risky choices which could result in either the addition of 40 or 80 points or the subtraction of 40 or 80 points. The results were that the older subjects showed significantly greater activation of the right insula when making the risky choice than did the younger subjects, which neurobiologically identified the older subjects as far more risk averse and harm avoidant than the younger subjects. Not surprisingly the older subjects also made significantly fewer risky choices than did the younger subjects.

Figure 3) The Right Insula

What does all of this tell us about addiction? We see that high risk behaviors such as binge drinking, shooting heroin, or smoking cigarettes are bound to be far less attractive to old people than to mature adults, and far less attractive to mature adults than to adolescents. This increase in risk avoidance exactly mirrors the decrease in addiction due to spontaneous remission which we see in Figure 1. The older you get the more likely you are to quit an addiction because the less likely you are to find high risk behaviors to be attractive. Maturing out of addiction is clearly built right into our brains.

The Effect Of Peers In Adolescence

Numerous researchers have provided experimental and empirical evidence for increased risky behavior when adolescents are in the company of peers as opposed to when they are alone or in the company of adults. Dr. Laurence Steinberg (2008) tells us:

"The heightened attentiveness to social stimuli that results as a consequence of puberty is particularly important in understanding adolescent risk-taking. One of the hallmarks of adolescent risk-taking is that it is far more likely than that of adults to occur in groups. The degree to which an adolescent's peers use alcohol or illicit drugs is one of the strongest, if not the single strongest, predictor of that adolescent's own substance use. Research on automobile accidents indicates that the presence of same-aged passengers in a car driven by an adolescent driver significantly increases the risk of a serious accident. Adolescents are more likely to be sexually active when their peers are and when they believe that their friends are sexually active, whether or not their friends actually are. And statistics compiled by the Federal Bureau of Investigation show quite compellingly that adolescents are far more likely than adults to commit crimes in groups than by themselves."

Dr. Steinberg posits that there is a neurobiological basis for this peer-mediated increase in risky behavior which is due to an increase in oxytocin receptors in adolescence. Oxytocin is the "empathy hormone." Steinberg found changes in fMRIs which corresponded to increased risk taking in a video game when a peer was present.

Do Drugs Stunt Your Emotional Growth?

A favorite bit of rehab hype used as a scare tactic to stop people from using drugs is to say "The minute you start using drugs you stop growing emotionally and the minute you attain sobriety you start growing emotionally again." This bit of hyperbole is clearly untrue because it makes no distinction between someone who smokes one joint a month and someone who shoots heroin ten times a day. Drug use clearly does not entirely arrest intellectual or emotional growth in the brain. However, the question remains: Can drug use interfere with the normal development of the brain in children and adolescents in a dose dependent manner? Although this is a very under-researched question, the tentative answer seems to be yes. Alcohol, illicit drugs, and psych meds such as antipsychotics and antidepressants all appear to have some negative impact on the normal brain development of children and adolescents. If drug use cannot be eliminated then reducing it is far better than doing nothing it seems.

Dr.Feldstein-Ewing, who is a specialist in this area, states that, "There are no data supporting the common claim in the world of adolescent addiction treatment that a person with a substance use disorder is emotionally stuck at a certain age." She also notes that it is quite possible that it is the more emotionally immature adolescents who are attracted to drugs in the first place (Fletcher 2013).

A Word About The Prefrontal Cortex

The prefrontal cortex is the part of the brain which humans use to make plans and decision in order to acquire things which they like and to avoid things which they dislike because they are unpleasant or painful. The prefrontal cortex and the limbic system (including the reward system) work in tandem with each other to help the individual and the species survive; the reward system tells the prefrontal cortex that things like food or sex are good so that the prefrontal cortex will continue to make plans and decisions to get more of these pro-survival things.

The fact that the prefrontal cortexes of habitual drug users react positively to drugs and drug-related stimuli whereas those of non-drug users do not is not a mark of pathology--all it tells you is that habitual drug users like using drugs, One would no doubt see identical reactions to money on the brains of hedge fund managers; the pathology here is in the eye of the beholder, not in the reactions of the brain.

The notion that drug use somehow turns Dr. Jekyll into Mr. Hyde, that it gives people "addict personalities" and turns them into pathological liars and causes them to suffer from "denial" and other "character defects" is belied by all empirical evidence.

Research clearly demonstrates that people who are physically dependent on a substance are no more likely to lie then a general sample of the population. Research has also demonstrated that people who suffer negative consequences from drug use do not deny it to themselves. What causes denial is not drug use; it is incompetent drug treatment techniques. It is also very likely that rehabs teach people how to act like addicts and adopt many behaviors which they did not have before rehab (Szalavitz 2010, Fletcher 2013). Finally, if one only compares subjects in rehab with the general population then one will have a biased sample since the people in rehab

are the ones more likely to be caught. Antisocial personality disorder is far more prevalent in a sample of drug dependent people in rehab than a sample of drug dependent people in the general population for this very reason.

Confrontational counseling causes people to lie. Confrontation leads people to lie whether they are drug users or not. Likewise the threat of taking away something which an individual values will cause most individuals to lie, as will the threat of pain, regardless of whether that individual uses drugs or not. Miller and White (2007) tell us:

> "There never has been a scientific basis for believing that people with substance use disorders, let alone their family members, possess a unique personality or character disorder. Quite to the contrary, research on virtually any measure reflects wide diversity of personal characteristics among people with addictions, who are about as diverse as the general population, or as snowflakes. Studies of defense mechanisms among people in alcohol treatment have found no characteristic defensive structure, and higher denial was specifically found in a clinical sample to be associated not with worse, but with better treatment retention and outcomes.
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> "What might account, then, for the robust belief in an addictive personality with characteristic immature defense mechanisms, a professional view that persisted for decades? Surely the writings and speeches of Tiebout and others were not in themselves sufficient to crystallize this view. Counselors genuinely experienced their clients as inevitably mired in denial. If their clients did not walk through the door all the same, how did this belief become so widespread?
>
> "An answer, perhaps, is that confrontation and denial form a complementary and self-perpetuating cycle. Defensiveness is a normal human response when one is accused, demeaned, labeled, disrespected or threatened. In other words, suspicion and confrontation are self-fulfilling prophecies. Confronting evokes client defensiveness, which in turn appears to confirm the diagnosis and bolsters the belief that such clients are typically defensive and intransigent. Clinical experiments have demonstrated that clients' levels of resistance are very much under the control of the counselor, and influenced by therapeutic style. Counselors can drive resistance up and down within the same session and client, simply by switching back and forth between a directive-confrontive and a listening-supportive style."

Motivational interviewing is a non-confrontational therapy pioneered by William Miller. Therapists who use motivational interviewing find that clients are honest about drug use and its consequences. It is standard operating procedure in most rehabs to force clients to admit to being pathological liars and say that "all addicts are pathological liars"--clients who fail to do so are shamed by the group an otherwise punished. It is no wonder that rehabs teach people to have addict personalities by the time they graduate.

Ultimately it seems that the neuroscience teaches us that the prefrontal cortex of the substance dependent person acts essentially the same as that of the non-dependent person. In other words, the substance dependent person uses the prefrontal cortex to get what he likes and avoid what he

dislikes--exactly as does the nondependent person. What tells both non-dependent persons and dependent person what they like and what they hate? The limbic system and the reward center of the brain.

The real difference is that the drug dependent person likes drugs and feels pain when they are withdrawn--the nondependent person does not.

Genetics And Brain Hijacking

A very naive version of the hijacked brain theory posits that there is a single gene for addiction and if you have the gene and are exposed to a substance you will become an instant addict whereas if you don't have the gene it doesn't matter if you shoot heroin all day long you won't get addicted. Dr. Drew has stated (CNN 2003), "If you don't have the gene, you don't get the disease." This erroneous hypothesis posits that you either have the good gene and inherit a normal reward pathway or you have the bad gene and inherit a pathological reward pathway which guarantees addiction with a single exposure to a drug--any drug will suffice to addict you to all drugs.

No serious addiction researcher believes this. Addiction is not like the color of Mendel's peas, a trait which is located on a single gene. If you take yellow peas and cross them with green peas the offspring are not yellowish green peas--instead you get three yellow offspring for every one green offspring--this is what happens when a trait is associated with a single gene. In the case of human skin color, however, the trait is located across many different genes. When black people and white people have offspring the result is brown babies, it is not three white and one black baby. There are a whole multitude of genes which affect the predisposition of addiction. Genetic predisposition for addiction lies on a continuum--just like human skin color does. Moreover, serious genetic researchers posit that only about 50% of the tendency to get addicted is genetic (Ducci and Goldman 2008); even the strongest proponents of genetic causation posit that about 50% is due to other factors such as environment. One huge factor which has been identified is trauma; there is ever increasing evidence that trauma can turn the genes for addiction on (Mate 2010). Are there genetic variations in the reward pathways? The evidence suggests that we make a cautious answer of "yes" (Comings and Blum 2000). However it is also quite likely that these variations are analog and not digital--that they exist on a continuum and are not an on/off toggle switch.

Moreover, even if one has both genetic and environmental predispositions for addiction these are not causative. A single exposure to a drug will NOT cause addiction. It takes a lot. Moreover, if one wants to successfully kick an addiction it may well be necessary to eliminate the environmental factors that keep the addiction in place as the best coping mechanism which the individual has available to them. More on this below.

What Neuroscience Tells Us About Overcoming Addiction

The battle to overcome an addiction essentially consists of a battle between the mature prefrontal cortex and the id-like limbic system, although there are a number of other huge factors which can make or break the victory in overcoming an addiction including environmental factors and

trauma. The research clearly shows us that the more resources a person has intact, the more likely that person is to successfully overcome an addiction (Peele 1992).

You might have heard the popular myth that an alcoholic or addict has to "hit bottom" before they can recover. This is not only untrue, but it is dangerous and has resulted in the deaths of far too many people with substance use problems. The myth originates with AA and appears to stem from the fact that AA's founders found it easier to recruit members who were in a state of desperation. However, joining AA and overcoming an addiction are two separate things. The majority of people who overcome addictions do so without AA or treatment. Moreover, many people who join AA do not overcome their addictions as a result. Other people who join AA may not have addictions in the first place.

Trauma at any point in one's life increases the odds of addiction and/or problematic substance use. Early childhood trauma in particular increases the propensity towards addiction and the greater the number of traumatic incidents the child undergoes the more the propensity for addiction increases. There are several neurochemical reasons for this. Childhood trauma decreases the amount of oxytocin produced by the brain. Oxytocin is often called "the love chemical," it is responsible for such behaviors as empathy and bonding. Trauma also causes release of cortisol, the "stress chemical."

It is well known that many genes are turned on or off by environmental factors. For example, the sex of the European pond turtle, *Emys obicularis,* is determined by the temperature at which the eggs incubate. High temperatures turn on the genes for femaleness and turn off the genes for maleness and the result is female turtles. Low temperatures turn on the genes for maleness and turn off the genes for femaleness and the result is male turtles (Gilbert 2000).

An increasing body of evidence suggests that the environment can turn on or off genes related to addiction. A study which compared rhesus macaque monkeys raised in cages with those raised by their mothers found that those raised in cages drank more alcohol as adults and were more intoxicated by it (Barr et al 2003). Moreover, this behavior could be traced to the expression of a single gene: the serotonin transporter rh5-HTTLPR allele which was affected by the early environmental stress of being cage-raised. Data such as this coupled with the empirical evidence they individuals with a history of major childhood trauma are far more susceptible to addiction strongly suggests that this trauma leads to addiction by turning on genes for addiction and turning off genes protective against addiction. Addiction treatment should be trauma sensitive. Unfortunately far too much of addiction treatment found in the US serves only to traumatize individuals (Fletcher 2013) and interfere with the process of natural recovery.

Dr. Rajita Sinha states (Sinha 2009):

"Converging lines of evidence indicate that stress increases risk of addictive behaviors. Early life stress and child maltreatment, chronic cumulative adversity, major life trauma and negative emotionality and impulsivity/sensation seeking traits are each associated with increasing level of drug use and abuse. Persistent and uncontrollable stressful experiences interacts with individual genetic susceptibility to alter synthesis, expression and signaling in stress-related pathways (e.g. corticotrophin releasing factor (CRF), glucocorticoids, norepinephrine, GABA, neuorpeptide Y,

BDNF, serotonin, gluatamate and dopamine), thereby resulting in individual differences in stress responses. For example, genetic variation in the serotonin transporter gene interacts with early life stress resulting in hyperresponsivity to stressors that increase vulnerability to psychiatric disorders such as major depression. Similarly, individual variation in the NPY gene is associated with anxiety and emotional reactivity. Chronic adversity and early life stress is also associated with altered glucocortoid gene expression, increased CRF mRNA expression in the amygdala, and changes in serotonin function."

"Tough love" camps which torture teens in the name of "drug treatment" actually make addictions worse and interfere with the natural process of spontaneous remission from addiction for all the neurochemical reasons named above.

Battling The Limbic System

One of the least effective ways for the prefrontal cortex to battle with the limbic system's craving for the addictive substance is direct opposition: in other words sitting in a chair with your fists clenched telling yourself over and over that you won't drink. If you try to use this brute force "willpower" method then the odds are good that you will fail and that you will drink. The best strategies for overcoming an addiction are those that work to speed and strengthen the process of spontaneous remission by harnessing the power of the maturing prefrontal cortex and encouraging its maturation. Some very effective ways of harnessing the power of the prefrontal cortex to battle the limbic system and speed the process of natural recovery are the following:

- **Urge surfing:** This is a technique pioneered by Dr. Alan Marlatt (1985). Marlatt taught subjects that urges only last ten minutes or so, if one observed them and quietly waited them out they would pass on their own. He christened this technique "urge surfing."

- **Distraction:** Find a non-drug activity to distract you from thinking about drugs, such as going to a movie. Recommended by Dialectal Behavioral Therapy (DBT).

- **Self-Soothing:** Soothe yourself with a hot bath or ice cream instead of using a drug. Also from DBT.

- **Planning:** Write out a detailed plan of how you will avoid your addiction.

- **Charting:** If you are moderating, use a calendar to track your drug or alcohol use.

- **Doing a CBA:** Write out the pros and cons of using drugs and the pros and cons of not using drugs. This is also called a decisional balance sheet.

- **Doing an ABC:** A cognitive behavioral technique from Albert Ellis, see SMART's Crash course in ABCs for details.

- **Increase Self-Efficacy:** The more that one believes that one is capable of overcoming an addiction, the greater success one will have in doing so.

Is Abstinence Necessary?

The traditional view is that taking even one drink or one drug is like lighting a fuse to a bomb that lies dormant in the limbic system just waiting to explode into full blown addiction again with the first rush of dopamine into the nucleus accumbens. The problem with this picture is that it does not fit the empirically observed facts but rather fits in with a lot of mythology created by the treatment industry.

NESARC (NIAAA 2009) tells us that about half of people who overcome addiction to alcohol do so by cutting back and about half by quitting completely. The simple truth is that some people find that quitting is easiest and others find that cutting back is easiest.

If you used to get drunk every day and now you decide to start getting drunk every day again then most assuredly you will set off that dopamine bomb in your limbic system. However, if you limit yourself to two drinks instead of twenty you are going to release far less dopamine and you may find that this two drink limit is quite controllable. Other people successfully control their drinking by limiting the frequency with which they choose to get intoxicated. They may release large quantities of dopamine at once but because they do so infrequently this prevents the addiction cycle from re-establishing itself. Other people find that any drinking at all tends to be a trigger and that total abstinence is easiest to maintain. Some people find that controlled drinking is easier to maintain than abstinence because they feel deprived when abstaining totally and this drives them to go on period uncontrolled benders. So it is not necessarily for the best to try to convince someone who is successfully controlling their drinking to switch to an abstinence goal. Some people succeed best with abstinence. Some succeed best with controlled drinking. One size does not fit all.

Prevention

What the neuroscience and the empirical evidence together teach us is that the best way for society to fight addiction is through prevention. Effective prevention means social changes to reduce and eliminate childhood trauma and would need to be rooted in campaigns to eliminate economic and social disparity. Scare tactics like DARE do not work. Rehabs which teach powerlessness are no more effective than sticking pins in voodoo dolls. Politicians prefer to talk about genetics rather than social change and throw money at treatment because they are unwilling to talk about the far reaching social changes needed to make this a better world with less addiction in it.

Conclusion

What we see in a person with an addiction is a tug of war between opposing forces. The reward system of the brain pulls the individual in the direction of addiction and increased substance use. However, both environmental and neurobiological factors associated with aging and maturity pull the individual in the opposite direction away from addiction and substance use. Which wins?

The evidence shows us that in the majority of cases the addiction loses. Maturity wins. The natural outcome of addiction is for people to overcome it on their own without treatment or AA.

How much do we really know about the function of the brain and neurochemistry? Reputable researchers will put the number at less than 10%. But even with the little glimmers that we do have we are starting to understand something about how people overcome addiction. And it is not what the hype of the rehab programs tell us at all. People overcome addiction after making a decision to change and then doing the work required to succeed at changing.

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