

## **Heredity, Environment & Psychoactive Drugs**

As any doctor will tell you, all drugs have side effects; just read the label. If the drugs are psychoactive, they will primarily work on the brain, but that doesn't mean that they won't impact other parts of the body, especially the heart and the lungs.

People take drugs to feel different about themselves and their surroundings. People take drugs primarily to alter their mood. Most often, the sensations people get from these drugs pass quickly, sometimes they have negative reactions, but most often, they are not fatal. The more frequently a person uses a drug, the more reinforcing it becomes, which increases the potential for a wide range of physical and mental health consequences.

The way drugs are put into the body affects the speed at which they reach the bloodstream and ultimately the brain.

Ingesting takes 15 to 20 minutes through the small intestine;

Snorting takes 3 to 5 minutes through nasal capillaries;

Injecting takes 15 to 30 seconds in a vein and 3 to 5 minutes in a muscle or under the skin;

and smoking takes 5 to 7 seconds through the lungs.

"Whew, I have tried them all. I have, when I first got introduced to methamphetamine, um, it was snorting, and um, it was painful. Then after years of that it came to smoking it when then I started IV using as well."

Within ten to fifteen seconds after a drug's molecules enter the bloodstream, they reach and cross the blood-brain barrier, a shield that normally keeps unwanted substances and bacteria from reaching the brain. The brain is the most protected organ in the body, so any breach of this barrier means that all organs of the body have been breached. Psychoactive drugs cross the blood brain barrier because they are fat soluble and the brain is essentially a fatty organ.

The central nervous system or CNS is a communications network that includes the brain and the spinal cord. It has connections through the peripheral nervous system to every other organ and tissue in the body so any alteration of the CNS can affect every other organ and tissue.

Normally, messages travel from nerve cell to nerve cell until they reach their desired target. These messages travel as electrical impulses until they reach the junction between nerve cells called a synapse. There, tiny bits of chemicals called neurotransmitters are released, cross the synaptic gap, and slot into receptor sites on adjoining nerve cells reestablishing the electrical impulse. This alteration between electrical and chemical signals occurs constantly within our brain.

Psychoactive drugs affect the mind and body because they either resemble these natural or endogenous neurochemicals or they manipulate them.

“Our brain has its own uppers like adrenaline and noradrenaline. It has its own downers like GABA and serotonin. It even has its own all arounders like anandamide and acetylcholine. And psychoactive drugs by accident happen to mimic or interfere with these natural brain chemicals.”

In general, each class of psychoactive drugs affects a unique group of neurotransmitters. However, there is one neurotransmitter all psychoactive drugs have in common and that is dopamine, sometimes referred to as the reward chemical because it affects the reward-reinforcement circuit.

Under normal circumstances, the reward-reinforcement circuit gives a surge of pleasure when a survival related action takes place. These include eating, satisfying thirst, or having sex. Once the person has eaten, drunk, or had sex and that need has been satisfied, another part of the circuit which contains the satiation or satisfaction switch, is activated sending a feedback message to stop.

Psychoactive drugs hijack this circuit, misleading the brain into believing that the drug is crucial for survival and therefore should be used again and again and again. . . .

“Crack tastes like more . . .that’s all I could say. You take one hit, it is not enough, one hit is not enough, a thousand is not enough. You want to keep going on and on because it is like a 10 second head rush, right after you let the smoke out.”

In addition to the powerful messages to repeat the action, psychoactive drugs or addictive behaviors disrupt the satiation switches. A person doesn’t know when to stop . . . there is no satiation point . . . In fact, in drug dependent people, the craving increases as the drug is used, instead of decreasing as it normally would.

“People really have to appreciate both addicts and non addicts, how powerful the message is that addictive psychoactive drugs send to the brain. They impact the very basic system of the brain and make the individual continue using the drug.”

A person’s attachment to any mind altering substance can be divided into six levels.

The first level is abstinence. There is no use, except accidentally.

The second is experimentation. People do not seek out the drug; they are simply curious and try it when it becomes available to satisfy that curiosity. It has no negative consequence in their lives.

"I always wanted to smoke weed, like since I was younger like cause I heard it was tight so then um, I don't know, my friend gave me some and we smoked behind my house, I got ripped."

Social or recreational use is the third level; people do seek out a drug, but there is no established pattern and it has little impact on their lives. Beers at a party or an occasional marijuana joint with some friends fit this level.

"And I started college at 17 and it was just a social a, drinking at sorority/fraternity parties, things like that although I was not a member of a sorority. It was weekends only. You know, I went to school. I had good grades. I was on the honor roll. I um, kept a part time job."

With habituation there is a definite pattern of use. The TGIF high, the wake-up bong, or the quad espressos throughout the day are some examples. Regardless of circumstances, the person will use their drug of choice, and if it doesn't affect their life in a very dangerous or negative way, it could be called habituation.

"I, I, I used to think like you know, it was harder for me to go sleep, not being high, or being high or yeah, it was a lot easier for me to sleep if I was high but nowadays, I find that if I get really stoned before I go to sleep, I can't go to sleep because I am just constantly thinking my brain is running a million miles and hour and there is a full orchestra playing in my head and I can't stop."

The fifth level is abuse, defined as the continued use of a drug despite negative consequences - the meth user with a history of high blood pressure. . . the alcoholic diabetic . . . the two-pack-a-day smoker with emphysema.

"I got citations for um, possession of alcohol and a, marijuana and then I got um, when I was put on probation then I had you know random urine tests, I, it came out dirty with cocaine two times and I got put in the hall for that. And just you know the consequence from my parents I lost their trust and everything."

The bridge between abuse and addiction is compulsion. When a person spends most of their time getting, using, or thinking about a drug, that is addiction. When, in spite of negative mental or physical health consequences, a person continues to use, that is addiction.

"You know, I was drinking exorbitant amounts of alcohol and I intended to only drink one night and ended up in a campground drinking for three months. I never made it home. I couldn't put it down. I realized at one point that I didn't have long left. I knew that I couldn't go on like that. I was up to a gallon of vodka a day."

So, what makes a person move from experimentation to abuse and addiction? What factors make a person susceptible?

“Addiction results from a complex interaction of a variety of important factors. There is first of all genetics; a person’s genetic contribution to their susceptibility or vulnerability to drug abuse. Secondly, there is the environment and the stress of the environment that contributes to your use of the drug and their continuing use of the drug. Included in that is even nutritional factors; the food that you put into the body and how that affects the brain. And finally of course, there is the use of the psychoactive drugs themselves which are basically toxins to the brain. The brain recognizes the toxins and adapts to try and deal with that toxin because those adaptations lead to greater compulsivity.”

Researchers now believe that genetics account for from 10 to 60% of a person’s susceptibility to addiction. This means that there are dozens of genes that have the potential to affect compulsive behavior and if an individual is born with most of them, genetics might account for 60% of the susceptibility. If an individual has only one or two of the genes, then heredity might be responsible for only 10% of the susceptibility.

“I know I’m genetically predisposed. It’s definitely within my family, um, both sides as far as my parents. My dad’s mother and my dad and then on my mom’s side she’s not but her daddy was. We have a long history of it in our family.”

Genetics is simply a starting point; a person’s environment takes over from there, shaping and connecting the brain to experiences, particularly emotionally charged ones.

“My mom’s boyfriends, dealers, whatever, I had a lot of that shit going on, a lot \* of abuse, I was always getting beaten up. Being molested, that kind of shit by all \* of her dealers. And a, actually the first time I went into the institution was when I was 13. It was because a couple of months before that I had been raped.”

Finally, genetic and environmental susceptibility can then be triggered and reinforced by continued use of a psychoactive drug.

“When I got in like ninth grade, started like, I, I didn’t drink beer any more, straight tequila, like whiskey, whatever, Bacardi, all that, and I would drink like bottles of that shit.”

“What will you have gents?”

“Another glass of sherry and see if you can’t find a king size egg to toss in, it’ll be my breakfast.”

Heredity, environment, and psychoactive drugs all conspire to reshape the central nervous system’s chemistry and anatomy and compel a drug user to move from experimentation to abuse and finally to addiction.

“Stick to whiskey, nothing bad will ever happen to ya.”

“It was the stress of work that caused me to really just throw myself into my drug use. It wasn’t recreation anymore. It was to forget. From forgetting, it became an addiction. It was just something I had to have whether my day was good or bad. I just had to have it.”

“The brain is really set up to avoid things that bring us harm or bring us problems in life but in an addict, what happens with addictive psychoactive drugs is the brain cells have changed, they’ve altered and they have changed to the point where the ability to stop something that brings us harm and brings us problems in life cannot operate. So an addict continues to use drugs despite negative consequences which is a total violation of how the brain is supposed to act.”