



Psychoactive Drugs and Mental States

A **psychoactive drug** is a chemical substance that acts primarily on the central nervous system where it alters the brain's biochemistry (neurotransmitters), resulting in temporary changes in perception, mood, consciousness and behavior. Depending on their effects on the central nervous system and their impact on behaviour and mood, these drugs can be classified as stimulants, depressants, opiates and psychedelics. Some commonly used drugs however fall outside of these four classifications or may fall into more than one category.

Drug Class	Effects	Examples
Stimulants	Increases levels of physiological or central nervous system activity in the body. In moderate amounts, they produce feelings of excitement, confidence, and well-being or euphoria.	Nicotine, caffeine, cocaine, amphetamines, methamphetamines
Depressants	Slows activity in the central nervous system by reducing arousal and stimulation in certain parts of the brain. In moderate amounts, make a person feel calm and drowsy.	Alcohol, tranquilizers, and barbiturates
Opiates	Acts to relieve pain by mimicking the action of endorphins. Have a powerful effect on emotions and if injected produces feelings of euphoria.	Opium and their derivatives including morphine, heroin, methadone, and fentanyl
Psychedelic	Disrupt normal thought processes including the perception of time and space. May produce visual hallucinations. Emotional reactions vary from person to person.	Lysergic acid diethylamide (LSD), psilocybin (mushrooms) and <i>Salvia divinorum</i>

With long-term use, many psychoactive drugs can result in adaptive (compensatory) brain changes where a higher quantity of the drug is needed to get the same effect in what is known as *tolerance*. When dependence and tolerance to a drug has been developed followed by an abrupt cessation in use, many physical (nausea, sweating) and psychological (depression, sleep problems) symptoms will result in what is known as *withdrawal*.



Effects of Psychology on Drug Use

Although it has been shown that the chemical agent of a drug is the primary contributing factor to its physiological effects, there have been other biological/psychological effects that contribute to the psychoactive effects of drugs. These include:

- Individual factors - body weight, metabolism, initial state of emotional arousal, personality, and physical tolerance for the drug
- Experience with the drug – reactions to drugs change after frequent use
- Environmental setting – the context where the drug was taken
- Mental state – expectations about the drug's effect and reasons for taking it

Questions:

- 1) Which of the effects listed above explain why women get drunker than men on the same amount of alcohol consumed?
- 2) Which of the effects listed above explain why some people become more sociable and friendly upon taking drugs?
- 3) What are neurotransmitters?
- 4) How do psychoactive drugs produce their effects at the level of the central nervous system?
- 5) What neurotransmitters are affected by cocaine and are the amounts of these neurotransmitters increased or decreased?

Answers:

- 1) Individual factors – women generally have lower body masses and are smaller. Therefore their ability to metabolize alcohol differs from that of men.
- 2) Although some drugs have a direct impact on emotions (MDMA) due to the neurotransmitters that are being affected, the mental expectation of the individual often contributes to becoming friendlier or more sociable as is the case with alcohol.
- 3) Chemical substances that carry messages from one neuron to another at the synapse.
- 4) By increasing or decreasing the release of certain neurotransmitter at the synapse by: preventing reabsorption of excess neurotransmitters, blocking the effect of neurotransmitters or binding to the receptor to mimic the neurotransmitter that would normally cause a trigger.
- 5) Cocaine blocks the brain's reabsorption (reuptake) of the neurotransmitters dopamine and norepinephrine to make the levels of these neurotransmitters increase.

