# 5.2 Psychotomimetic

The term "**psychotomimetic**" is used to describe substances that can produce effects in the mind that mimic symptoms of psychosis, such as hallucinations, delusions, and alterations in perception. The term comes from "psycho" (mind) and "mimetic" (mimic). These substances are also commonly referred to as hallucinogens, due to their primary effect of causing hallucinations. The understanding and categorization of these substances have evolved, and they are sometimes called "**psychedelics**," emphasizing their mind-manifesting capabilities rather than just their ability to induce psychosis-like states. The following are examples of psychotomimetic drugs, and we will go into more detail of each one in this chapter.

1. **LSD (Lysergic acid diethylamide)**- Perhaps the most well-known psychedelic, LSD is renowned for its potent effects, including visual and auditory hallucinations, altered thoughts, and time perception. The experiences, often referred to as "trips," can vary greatly based on the dosage and the user's environment and mindset.
2. **Psilocybin-**Found in psilocybin mushrooms, this substance is converted to psilocin in the body, leading to effects similar to LSD but usually with a shorter duration. It can cause visual and auditory hallucinations, emotional shifts, and a sense of expanded consciousness.
3. **DMT (Dimethyltryptamine)-**DMT is a powerful psychedelic found in several plants and is the active ingredient in ayahuasca, a traditional South American brewed tea. DMT produces intense visual and auditory hallucinations and profound emotional experiences that can seem otherworldly.
4. **Mescaline**- This compound is derived from the Peyote and San Pedro cacti and has been used for thousands of years in Native American spiritual rites. It produces visual hallucinations and profound insight and is known for its empathogenic qualities.
5. **Phencyclidine (PCP)-**Originally developed as an anesthetic, PCP is not commonly grouped with classic psychedelics but is considered a dissociative drug. It can induce hallucinations, distorted perceptions of sounds, and an altered sense of self and environment.

## **Effects and Mechanism of Action**

Psychotomimetic drugs typically exert their effects by disrupting normal neurotransmitter systems in the brain, especially those involving serotonin, dopamine, and glutamate. For example, LSD and psilocybin primarily affect serotonin receptors, which are critical for mood regulation, cognition, and perception. This disruption leads to the profound changes in consciousness and perception associated with these drugs.

The effects of psychotomimetic drugs can vary widely depending on the substance, dosage, individual psychology, and environmental context. They can range from enlightening and euphoric experiences to frightening and disorienting ones. The unpredictable nature of these experiences, especially in uncontrolled settings, contributes to the risks associated with these substances.

Despite their risks, research into the therapeutic potential of psychotomimetics is growing, particularly for conditions such as depression, PTSD, and addiction. The unique effects of these substances on the brain are thought to offer new ways to treat these conditions, potentially resetting or altering dysfunctional patterns of thought and emotional responses.

## **Substance-Induced Psychosis**

According to the National Alliance on Mental Illness (2023), psychosis refers to an episode in which an individual has a break from reality. This often includes but doesn’t require delusions, or false beliefs that are firmly held despite clear evidence to the contrary, and hallucinations. About 3 in every 100 people will experience at least one episode of psychosis in their lifetime. Substance-induced psychosis, also known as “**substance-induced psychotic disorder**”, is simply any psychotic episode that is related to the abuse of an intoxicant. This can occur from taking too much of a certain drug, having an adverse reaction after mixing substances, during withdrawal from a drug, or if the individual has underlying mental health issues1.

There is a correlation between hallucinations with mental illness (schizophrenia) and those produced through the use of psychedelics. A study published in the Schizophrenia Bulletin Journal (2020) compared hallucinations under psychedelics with those observed in schizophrenia-spectrum disorders. The study found that while there are similarities between the two, there are also differences in the phenomenology and neural mechanisms of hallucinations under psychedelics and in schizophrenia-spectrum disorders.

Research indicates that the type of drug a person takes before an episode of substance-induced psychosis can be a predictor of whether they will later develop schizophrenia. The review found that cannabis, hallucinogens, and amphetamines have the highest rates of substance-induced psychosis that later transition into schizophrenia2.

It's important to note that the use of hallucinogens/psychedelics is not a direct cause of schizophrenia, but rather a potential risk factor. In rare cases, psychedelics can trigger lasting psychotic reactions in individuals with a family history of psychosis or those predisposed to schizophrenia. This is why people with schizophrenia are typically excluded from clinical trials involving psychedelics3. While psychedelics are being researched for their potential therapeutic benefits in treating various mental health conditions, their use in individuals with schizophrenia remains highly cautious due to the risk of exacerbating psychotic symptoms4,5. More research is needed to fully understand the relationship between the two.

## References:

1. American Addiction Centers, 2024
2. Leptrougos, P., Fortier-Davy, M, Carhart-Harris, R., Corlett, P., Dupuis, D., Halberstadt, A., Kometer, M, Kozakova, E., Loroi, F., Noorani, T., Preller, K., Waters, F., Zaytseva, Y., and Jardri.R., 2020
3. The Rise of Psychedelic Psychiatry, Nature, Tullis, P., 2021
4. Hallucinogens and Schizophrenic Behavior: Exploring the Complex Connection, NeuroLaunch, 2024
5. Hallucinations Under Psychedelics and in the Schizophrenia Spectrum: An Interdisciplinary and Multiscale Comparison, Schizophrenia Bulletin-Journal of Psychoses and Related Disorders, Leptourgos, P., Fortier-Davy, M., Carhart-Harris, R., Corlett, P., Dupuis, D., Halberstandt, A., Kometer, M., Kozakova, E., Loroi, F., Noorani, T., Preller, K., Waters F., Zaytseva, Y., and Jardri, R., 2020

## Images:

Figure 1: An arrangement of psychoactive drugs via Wikimedia Commons <https://commons.wikimedia.org/wiki/File:Psychoactive\_Drugs.jpg>

Figure 2: Amphetamine pills via Openverse <https://openverse.org/image/66a645f3-adc6-47cf-85d9-ff14b2286c69?q=Amphetamine+pills&p=1>

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