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Psychedelics are a class of psychoactive compounds that, when ingested by humans, temporarily alter our brain chemistry and affect our perception, mood, and cognitive processes in characteristic ways.

The term “psychedelic” was coined in 1956 by the psychiatrist Humphry Osmond to describe the effects of drugs like LSD and mescaline. Osmond chose the Greek *psykhē* for “mind” and *dēloun* for “show,” translating this new term as “mind manifesting.”^{1, 2} The older term “hallucinogen” is still found in some laws and scientific literature. The newer term “entheogen” connotes spiritual intent or effect and is the term of choice in the movement to “decriminalize entheogenic plants and fungi.”

There are hundreds of psychedelic compounds. Some are naturally occurring in plants, fungi, and animals, and have been used in spiritual and medicinal practices for millennia.³ Others are created in the lab: the late chemist Alexander “Sasha” Shulgin (coauthor of *PIHKAL: A Chemical Love Story*, short for Phenethylamines I Have Known And Loved, and *TiHKAL: The Continuation*, which documents experiences with tryptamines) estimated he created nearly two hundred new psychedelic compounds,⁴ including 2C-B and 2C-T-7, which are similar in chemical structure to MDMA.⁵

We classify these compounds into two categories, classic and non-classic, depending on the ways they affect our brain. Below we outline some of these major compounds and the science of how they work. This list is far from comprehensive; it focuses on the compounds that have been the subject of significant research in recent decades.

For more information on the mental health research, potential risks, and the legal landscapes for each substance, see the related fact sheets.

Classic Psychedelics

Classic psychedelics work on serotonin 2A receptors in the brain and central nervous system. Studies suggest they also decrease blood flow to certain brain regions, including the default mode network, a group of brain regions associated with higher-order metacognition, the construction of the ego, and conceptions of the self.⁶

While they are active in the body, classic psychedelics can bring about visual and auditory distortions or changes; hypersensitivity to touch, light, and sound; an altered or slowed perception of time; synesthesia; and, in rare cases, hallucinations. Classic psychedelics are also associated with mystical-type or spiritual experiences, often marked by a sense of oneness or unity, or a dissolution of ego. These substances can also prompt uncomfortable and even terrifying experiences, including powerful negative emotions, confusion, paranoia, delusions, and dissociation.

Common Classic Psychedelics

Psilocybin mushrooms

Other names: magic mushrooms, mushrooms, shrooms

Psilocybin is a naturally occurring chemical compound found in more than one hundred mushroom species.⁷ It is usually consumed orally by eating either dried or fresh mushrooms, or

adding them to food or tea, or by taking a capsule of its dried material. Indigenous communities in Mexico and Central America have used psilocybin mushrooms in celebrations, healing rituals, and in religious ceremonies for centuries and possibly millennia.⁸

It usually takes under an hour for the psychedelic effects to become noticeable and the peak of the experience usually starts roughly two hours later. The entire trip can last six to eight hours, and positive effects sometimes last for months or even longer after the session.⁹

LSD

Other names: acid, lysergic acid diethylamide, LSD-25, L

LSD is a synthetic substance originally derived from ergot, a fungus that grows on rye and other cereal grains.¹⁰ The drug, first created in 1938, was the twenty-fifth in a series of compounds synthesized by the Swiss chemist Albert Hofmann at the pharmaceutical company Sandoz. It wasn't until 1943, after accidentally ingesting some of his creation, that Hofmann realized the substance had psychoactive properties. In 1947, Sandoz dubbed the compound Delysid and began distributing it as an experimental psychiatric drug.¹¹

In the 1950s and 1960s, scientists studied whether LSD could be used to treat alcohol addiction and trauma.¹² The U.S. government also launched a secret operation called MK-ULTRA, which covertly studied whether LSD could be used as a truth serum or mind-control agent, administering high doses to civilians, soldiers, and prisoners, often without their knowledge or consent.¹³ In the late 1960s, LSD was embraced by the counterculture movement.

LSD is usually ingested through small squares of paper ("blotter") containing the drug or orally as drops of a liquid solution. The onset of noticeable effects begin after some twenty to forty minutes, depending on the dose and the person, and the experience lasts from eight to twelve hours.¹⁴

Mescaline

Other names: Mescalito

Mescaline is a classic psychedelic found in several cacti, including San Pedro and the spineless peyote.¹⁵ It has been used for many generations and has played a role in Indigenous religious ceremonies in North America for over five thousand years.¹⁶ Peyote is the sacramental medicine of the Native American Church. (In religious contexts, it's not usually referred to as a psychedelic or even a drug.) Peyote grows wild only in Mexico and in small portions of the southern United States, and its population is in decline.

Mescaline was first isolated by the German chemist and physician Arthur Heffter in 1897,¹⁷ and in the 1950s the drug was used to simulate and study schizophrenia.¹⁸ Aldous Huxley made mescaline famous when he described his own psychedelic experiment with the drug in his landmark book *The Doors of Perception*.¹⁹

Like LSD and psilocybin, mescaline is ingested orally. The onset of subjective effects begins after around thirty minutes and lasts for ten to twelve hours. Mescaline is the least potent of the classic psychedelics, meaning more has to be ingested to occasion a certain intensity of effects.

DMT

Other names: Spirit molecule, Dimitri, businessman's trip, elf spice²⁰

N,N-dimethyltryptamine (DMT) is a naturally occurring compound commonly found in plant and animal tissue.²¹ It's one of only a few psychedelics that's naturally present in the human body, although its biological purpose is unclear.²²

DMT is a central component of ayahuasca, which Indigenous people in the Amazon basin have used for religious, divinatory, medical purposes for over a thousand years. It was first synthesized in 1931 by the Canadian chemist Richard Manske,²³ but it wasn't until 1957 that chemist Stephen Szára reported that DMT occasions psychedelic experiences similar to those of LSD.²⁴

DMT can be used in its isolated chemical form by vaporizing and inhaling it or by intravenously injecting it. Both methods bypass the digestive system (see “ayahuasca” below) and within seconds produce subjective effects, which are similar to those of other psychedelics, including possible mystical-type encounters.²⁵ At least one study found that “God-encounter experiences” were reported more often with DMT than with psilocybin or LSD.²⁶ The effects of DMT last only twenty to thirty minutes.²⁷ Because the trip is so short, DMT has been called the “businessman’s trip”²⁸ or “businessman’s lunch.”²⁹

Ayahuasca

Other names: Chacruna (plant); yajé, hoasca (tea)

Ayahuasca is the Quechua name the *Banisteriopsis caapi* vine and also for a tea made by combining the vine with leaves of the Amazonian shrub *Psychotria viridis*, which contains N,N-dimethyltryptamine (DMT), or with other plants.³⁰ This tea has been used for more than a thousand years by Indigenous people in Brazil, Peru, Bolivia, Colombia, and Ecuador in shamanic practices and to help diagnose or treat various medical, psychological, or spiritual conditions.³¹

On its own, DMT does not produce psychedelic effects if it’s taken orally, because the molecule is deactivated primarily in the gut by an enzyme called monoamine oxidase.³² But *Banisteriopsis caapi* contains monoamine oxidase inhibitors (MAOIs), which prevent that enzyme from deactivating DMT, allowing it to enter the bloodstream and reach the brain.

5-MeO-DMT

Other names: Bufo, the God molecule, the toad, and five-methoxy

5-MeO-DMT is short for 5-methoxy-N,N-dimethyltryptamine. It’s found in several plants and in high concentrations in the secretion of the toad *Bufo alvarius*.³³ It’s also possibly produced by the human body and has been found in human blood, urine, and cerebrospinal fluid.³⁴ 5-MeO-DMT was first synthesized in 1936 by Japanese chemists Toshio Hoshino and Kenya Shimodaira.

It’s usually inhaled through vaporizing or insufflation (snorting). Like DMT, the 5-MeO-DMT experience is quick, starting just a few seconds after ingestion and lasting about twenty to thirty minutes. (Snorted material comes on a bit slower and can last a bit longer.) The substance is sometimes paired with MAOIs, a class of antidepressants, which can make the experience longer and more intense.³⁵ However, this combination can be dangerous, causing abnormally high body temperature³⁶ and, in some cases, death.³⁷ In addition to effects shared with other classic psychedelics, some users have reported an empty or void experience similar to sensory deprivation.³⁸ There are also reports of fear, shaking, and profound terror.³⁹

Some worry that increasing demand for 5-MeO-DMT has threatened the Sonoran Desert toad population, which is already in decline.⁴⁰ Some herpetologists say there is no humane way to collect the secretion, because the compound is secreted as a defense mechanism only when the amphibians are in stressful or dangerous conditions.⁴¹ 5-MeO-DMT can also be synthesized in the lab. While many practitioners are satisfied with the synthetic chemical, other compounds in the toad secretion may have beneficial effects.⁴²

Non-Classic Psychedelics

Non-classic psychedelics include substances whose effect profiles overlap with those of the classic psychedelics but that don’t interact as prominently, or at all, with serotonin 2A receptors in the brain. Instead, these psychedelics interact with other neurotransmitter systems, including dopamine and glutamate, and often have effects outside of the general profile of the classic psychedelics.

Common Non-Classic Psychedelics

Ibogaine

Ibogaine is a naturally occurring psychoactive compound found in the root bark of *Tabernanthe*

iboga, a shrub native to Central West Africa. For centuries, members of the Bwiti religion have used iboga as a sacrament in rituals to bind themselves across time⁴³ with their ancestors and descendants or with one another through a shared experience of consciousness⁴⁴ It is still used by the Gabonese Fang people in religious ceremonies and as a stimulant and appetite suppressant.⁴⁵

How ibogaine works in the brain is not well understood. It interacts with numerous neurotransmitters in the central nervous system, including components of the acetylcholine, serotonin, dopamine, glutamate, and opioid systems.⁴⁶ It may also affect the neurotransmitter glutamate.⁴⁷ Its effects are prolonged, beginning half an hour to three hours after ingestion and peaking after eighteen to thirty-six hours.⁴⁸ The experience is often described as being in a “waking dream.” At first, users experience visual and sensory distortions. Some describe watching a panoramic readout or “slideshow” of past memories.⁴⁹ Afterward, they report going through a period of reflection and having residual effects including heightened awareness, mild stimulation, and disturbed sleep for up to seventy-two hours. In high doses, ibogaine can induce intense hallucinations.⁵⁰

Ketamine

Other names: K, Special K

In 1970, the Food and Drug Administration approved the synthetic drug ketamine for use as an anesthetic for humans.⁵¹ Ketamine is used widely as an anesthetic, especially for children and on the battlefield, and as a tranquilizer and anesthetic for animals. It is also sometimes used to treat chronic pain.⁵² Clinically, ketamine is administered intravenously, by intramuscular injection, or sublingually as a lozenge. Outside of medical settings, powdered ketamine is sometimes snorted.⁵³ In the 1970s, ketamine use increased, both as a recreational drug and as a tool for personal exploration.⁵⁴

Ketamine works by acting on receptors for the neurotransmitter glutamate, which may play a role in regulating mood.⁵⁵ At lower doses, ketamine can alter one’s perception and sense of time and space. At higher doses, the drug can cause a dissociative state, sometimes called a “k-hole,” during which people are unable to perceive or interact with the outside world.⁵⁶ These effects have some overlap with the general effect profile of classic psychedelics.

MDMA

Other names: Ecstasy, E, X, XTC, Molly, Adam

3,4-methylenedioxymethamphetamine (MDMA) is a synthetic drug first made in 1912 by the German pharmaceutical company Merck. It was used as an intermediate chemical in making a drug intended to stop blood loss but at that time it was not tested pharmacologically.

After LSD and other classic psychedelics became controlled substances in the United States, a few researchers turned their attention to the potential mental health benefits of MDMA.⁵⁷ During the 1980s, MDMA became a popular recreational drug at nightclubs and raves.

MDMA causes the release of serotonin, norepinephrine, and dopamine neurotransmitters, with the largest effect being on serotonin, which is associated with regulating mood. After the experience, serotonin levels may be depleted, causing some users to report feelings of depression, confusion, and poor memory, but those these symptoms usually resolve within days.⁵⁸ The long-term adverse effects of MDMA on memory and serotonin levels in chronic or heavy users are disputed.⁵⁹

Users typically consume MDMA orally in a pill or capsule and begin to feel its effects twenty to forty-five minutes later.⁶⁰ MDMA is known as an empathogen because while it does alter mood and has some psychedelic qualities, its effects differ significantly from those of the classic psychedelics. Rather than mystical-type experiences, MDMA usually produces a mellower experience during which people feel more empathetic, more open to bonding with others, and better able to process emotional or traumatic memories.⁶¹ The entire experience lasts about three to four hours.

Salvia divinorum

Other names: Salvia, diviner's sage, Maria Pastora, Sally-D

Salvia divinorum is a perennial herb native to regions in Oaxaca, Mexico.⁶² The Mazatec people indigenous to this area have used its leaves for centuries as a treatment for illnesses including headaches and gastrointestinal problems, and as part of their divinatory and spiritual practices.⁶³

Unlike LSD and other classic psychedelics, salvia doesn't act on the neurotransmitter serotonin. Instead, salvinorin A interacts with kappa-opioid receptors, which play a role in pain perception.⁶⁴

The method of consumption can affect the duration of the experience. Traditionally, the Mazatec consumed salvia by rolling fresh leaves into a thick wad and chewing or sucking on it, absorbing it through their cheeks, which results in a milder and longer-lasting experience. The Mazatec would also grind the leaves and mix them into a drinkable infusion.

Over the last decade, salvia has become more popular recreationally, with users typically vaporizing the dried, crushed leaves through a pipe or bong. This causes a nearly immediate, intense hallucinogenic experience that lasts only fifteen to twenty minutes. Users also drop a small amount of salvia-containing tincture under the tongue. This method takes up to ten minutes to produce effects, and the entire experience can last up to two hours.⁶⁵

Studies of participants who smoked salvia report intense visual and auditory effects similar to those of LSD and psilocybin, though with unusual hallmarks, such as feeling like a two-dimensional shape or perceiving the world as flat, like a coat of paint.⁶⁶ At higher doses it also caused participants to disconnect from reality and dissociate, reducing their ability to control or feel their bodies.⁶⁷

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