

Release

Drugs, The Law & Human Rights

LSD

Introduction

LSD is the shortened name of *Lysergic Acid Diethylamide*, a semi-synthetic drug of the ergoline family. Discovered (through accidental ingestion) by Swiss chemist Albert Hofmann in 1943, it is a powerful hallucinogenic drug. Originally a promising psychotherapeutic agent, the drug's unusual effects led to its popularity with the 1960s counter culture.

LSD causes the user to experience flowing visual patterns, though rarely full hallucinations; what many find striking are the changes it brings about in the sense of self, space, time and meaning. Some individuals have had what they regard as spiritual experiences with the drug, while critics suggest that it merely plunges one into a world of illusions. For this reason, LSD is known, by different scholars, both as an *entheogen* (producer of religious experiences) and a *psychotomimetic* (producer of psychosis-like effects).

The drug's effects are mediated by both the individual and their surroundings, and it is difficult to predict what type of experience a user will have. Effects can last from 8 to 24 hours, though the latter is rare. LSD is not addictive, and the drug quickly becomes ineffective if used daily.

Called 'acid', it usually comes as tablets or on blotting paper, though liquid LSD is occasionally available.

Chemistry

LSD affects a large number of the G protein coupled receptors, including all dopamine receptor subtypes, all adrenoceptor subtypes as well as many others. LSD binds to most serotonin receptor subtypes except for 5-HT₃ and 5-HT₄. However, most of these receptors are affected at too low affinity to be activated by the brain concentration of approximate 10–20 nM. Recreational doses of LSD can affect 5-HT_{1A}, 5-HT_{2A}, 5-HT_{2C}, 5-HT_{5A}, 5-HT_{5B}, and 5-HT₆ receptors. The psychotropic effects of LSD are attributed to its strong partial agonist effects at 5-HT_{2A} receptors as specific 5-HT_{2A} agonist drugs are psychotropics and largely 5-HT_{2A} specific antagonists block the psychotropic activity of LSD. Exactly how this produces the drug's effects is unknown, but it is thought that it works by increasing

glutamate release and hence excitation in the cerebral cortex, specifically in layers IV and V. In the later stages, LSD might act through DARPP-32-related pathways that are likely the same for multiple drugs including cocaine, methamphetamine, nicotine, caffeine, PCP, ethanol and morphine.

History

The discovery of the subjective effects of LSD is a well-known episode of 20th century drug cultural lore. Dr Albert Hofmann, working at the Sandoz pharmaceutical company in Basle, Switzerland, had been researching the fungus Ergot, which commonly grows on rye, and extracted a number of ergotamine molecules, one of which he had named LSD-25. On Friday April 16th 1943, he accidentally absorbed some of the substance through his skin, and experienced a mild trip. He repeated the experiment three days later, this time using a much larger dose: this was to become the famous ‘bicycle day’, named after Hofmann’s cycle ride on which he experienced the full effects of LSD.

The genie that Albert Hofmann released from its bottle that day was to have enormous social and cultural repercussions for the twentieth century and beyond.

The US military employed LSD amongst numerous other drugs in its notorious project MK Ultra in the 1950s; military personnel were given experimental doses in order to test its utility as a ‘truth drug’, a ‘brainwashing’ agent and so on; subjects were usually dosed without their knowledge and at least one suffered depression and suicide as a result.

Other Americans began using the drug for psychotherapeutic and spiritual purposes in the late 1950s and early 60s, and the drug showed great promise as a therapeutic adjunct. It rapidly spread beyond these intellectual and therapeutic domains into popular culture particularly that strand which was in the process of becoming the *counter*-culture. Former Harvard psychologist Timothy Leary (fired when his psychedelic sessions with students and counter-cultural luminaries became embarrassing for the college’s authorities) came to international notice with his *Turn on, Tune In, Drop out* slogan and his psychedelic religion.

The 60s generation, with its iconic bands in the vanguard (The Beatles, The Rolling Stones, Jefferson Airplane, Grateful Dead etc), all took acid and preached Make Love Not War cultural revolution. 1967 was the Summer of Love.

The US government outlawed the drug in 1966 and the UK government the following year. With the decline of the hippie movement, the use of LSD waned, having a resurgence in the 1990s in the context of radical dance culture. The end of LSD’s status as a mass drug and its weakening as a symbol of social revolt has, interestingly, enabled some of the research that had to be abandoned in the 1960s in the face of media panic and state repression to quietly resume.

Use and culture

LSD is a very powerful substance, with doses being measured in micrograms, and 50 to 250 micrograms being sufficient for a powerful experience, depending on metabolism, bodyweight, age, gender and so on. It usually comes in the form of blotters on which liquid LSD has been dissolved, sometimes as small tablets (microdots) and rarely as a liquid. The effects usually last between 6 and 12 hours, though they can last longer.

LSD is the psychedelic drug *par excellence*, in the sense that its effects can be unpredictable and are dependent on a number of factors. Dr Norman Zinberg referred to these as 'set' and 'setting', the former term denoting the state of mind and perceptual framework of the user, the latter denoting the physical and social context in which the use takes place. The kind of experience or 'trip' one has with a drug like LSD (psychedelic means 'mind-manifesting', that which unlocks and reveals the contents of the subject) is acutely influenced by these factors. As a result, the trip can be ecstatic and revelatory, or it can be extremely frightening and nightmarish. The popular use in the 60s and 70s, much of which was flippant, did lead some people into deep mental confusion; others undoubtedly found the drug to supply a profound and richly rewarding inner journey. Anybody contemplating taking the drug for the first time should find out as much as possible about it first, and make sure that it is taken in a safe and secure setting in the company of trusted friends, preferably with experience of using the drug. Once LSD is ingested there is little that can be done to stop its effects, though normally a trusted and experienced 'guide' can 'talk down' someone who is in a frightened and confused state of mind. If this proves impossible, an anxiolytic such as diazepam may help.

Health

Those who are suffering from mental health problems may find that LSD and psychedelics generally can make these worse, while there is some evidence that latent psychoses may be precipitated by use of the substance. 'Bad trips' may resemble psychotic states of mind but are usually transient unless underlying problems exist.

Research by Sandoz indicates that LSD can stimulate uterine contractions; therefore its use in pregnancy should be avoided. While various pieces of research conducted in the climate of the 1960s and 70s media panic claimed that LSD could, for example, cause chromosomal damage, this research is not considered reliable, and its results have not since been duplicated. The balance of the evidence is that LSD does not cause any lasting chromosomal changes.

The more realistic set of risks attending its use are those that stem from its influence on the faculty of judgment, and this seems to be particularly affected where the taker is also using anti-depressants such as lithium and the tricyclics. Accidents and physical injuries have resulted from such circumstances.