Humans indulge in activities that alter both the content and the experience of their own consciousness. Drugs are a means for achieving a number of particular, often recreational, changes in conscious experience. However, drugs are also a large contributor to, and facilitator of, human suffering and health problems. The best health advice anyone can give to most people most of the time regarding recreational drug use is this: “Do not use drugs”. Many people however, including me, do not find this advice particularly attractive, or even sensible. Assuming that a person wants to enjoy the mind-altering effects of psychoactive substances, two questions follows: which drugs are dangerous to use? And, more importantly - how can one know which drugs are more dangerous than others? The answer to both questions, of course, can be found through the illuminating lens of the scientific method.
David Nutt and his colleagues have studied the relative harm of drugs. In one of Nutt’s studies that were published in *The Lancet*, members of the British Independent Scientific Committee on Drugs was asked to rate 20 drugs on 16 criteria such as drug-specific damage, mortality, dependence and international damage.

Here is a display of the weighted scores:

In the diagram above both individual and societal factors are considered. It may come to a surprise to many readers that LSD and ecstasy are one of the least dangerous drugs. Notice also that Alcohol is the highest rated dangerous drug and that tobacco is on seventh place just below Cocaine (Both alcohol and tobacco are not even considered a drug by many people, including, sadly, politicians). However, heroin, crack and metamfetamine tops the list for the most dangerous drugs when only individual factors are considered, alcohol then dropping down to a fourth place amongst the most dangerous drugs. So, even when the obvious societal effects due to the widespread use of alcohol are not considered (alcohol rates very high, unsurprisingly, on “family adversities” and “environmental damage”) it still is the fourth most dangerous drug. Yes, that’s right. Alcohol nearly receives the bronze-medal for danger to individuals.
The particular type of neurotransmitters that a drug affects in the brain has a huge impact on the harms the drug can contribute to. A major similarity between the drugs that tops the list above is that these drugs, in addition to other areas in the brain (click here for a discussion), directly affect the dopaminergic “reward system” in the midbrain. This area has been shaped and “designed” by millions of years of natural selection in mammals to reward for adaptive behavior such as sex and the intake of nutritious food. When they are artificially stimulated by drugs such as heroin and crack cocaine they have adverse consequences for addiction and health (that is the reason why drugs such as nicotine and heroin have the characteristic addictive effects). Drugs at the bottom of the list, such as MDMA (ecstasy), mushrooms and LSD stimulate mainly serotonergic neurons (several places in the brain), and does not directly stimulate the mesolimbic reward systems (which is why they are not addictive).

The many myths and popular beliefs surrounding psychoactive substances and their harms are perpetuated through the popular media. An empirical observation of this phenomenon was provided by Alasdair Forsyth in 2001. He compared the official statistics on drug deaths in Scotland to the drug-deaths reported in the Scottish newspapers. His results are somewhat astounding: a huge proportion of deaths caused by recreational drugs were reported, whereas deaths caused by pharmaceutical drugs were vastly underreported. For example, 26 of 28 deaths were MDMA (ecstasy) was a possible contributor to death was reported, whereas just one in every 256 deaths caused by aspirin and one in 50 deaths caused by paracetamol were reported. This clearly gives a biased representation of the relative harm of drugs, particularly ecstasy, which, as is reported in the diagram above, is not at all that dangerous.

Cannabis is, relative to other drugs, one of the less harmful drugs. This may be hard to believe for some, because cannabis is one of the drugs that are highly politicized - misinformed policies and governments contribute a great deal to the wrongful assumptions and belief-patterns held in many societies. A common worry is that cannabis causes psychotic disorders and/or schizophrenia or that it is a “gateway drug” which leads to the abuse of more dangerous drugs. Both hypotheses have been put to the test:

There is indeed a correlational pattern between cannabis use and the development of psychosis (individuals with schizophrenic disorders are four times more likely to have smoked marihuana than the general population). This could mean, but not necessarily, that cannabis use causes psychosis - but correlation, importantly, does not imply causation. A Danish study found that individuals who were treated for post-marihuana smoking psychotic episodes had the same likelihood of having first-degree family members (mothers, siblings etc.) with schizophrenia as individuals who had been treated for schizophrenia itself (non-cannabis smokers). Those results suggest that cannabis can induce schizophrenia/psychosis in individuals that are genetically predisposed for developing the disorder, regardless of cannabis use. Arendt, one of the authors of the study, has commented that "these people would have developed schizophrenia whether or not they used cannabis”.

The gateway hypothesis is more controversial in the scientific literature. However, research on the gateway-hypothesis often suffers from the same flaws: a correlation between cannabis use and other drugs can be found, a possible causal relationship needs further scientific inquiry. Once again, the logical pitfall of the Post hoc ergo propter hoc fallacy must be avoided. Many cannabis smokers drank milk.
before they started smoking pot. Is there a causal effect? The reason why there is a relationship between cannabis smoking and other drugs (or indeed between the uses of several drugs in general) can be a result of genetic risk factors that contributes to increased risks for drug abuse in particular individuals. Humans with a stronger activation pattern in the brains reward system during intake of a drug have a susceptibility to drug abuse in general (interestingly, individuals that have a weak or absent activation in their dopaminergic reward systems when injected with alcohol are much more likely to be abstainers). This is why, most likely, that there is a correlation between cannabis use and other drugs, not because it is a “gateway” to the usage of several drugs.

It is important not to confuse illegality with dangerousness. The reasons why drugs are assigned particular legal statuses are mainly cultural and political in nature, not scientific. Now, does it not make sense, given the scientific understanding of relative drug harm, to correspond a drug’s legal and social status with the harm one can prescribe to it? It is of a great moral concern if risks of harm on particular psychoactive substances and their legal status remain unrelated. A study comparing cannabis use in Amsterdam (where cannabis is decriminalized) and San Francisco (criminalized) found no evidence that criminalization of cannabis reduces use, or that decriminalization increases use. In other words, cannabis legal status seems to be fairly unrelated to the amount, and to which extent, people get high. Clearly, a legal system that regulates and taxes cannabis use (like alcohol), rather than imprisons and criminalizes its users, which by the way, uses ridiculous amounts of tax-payers money, makes more sense.

Imagine if your child were to try a mind-altering drug. Would you rather have your child use a drug which, compared with other drugs, are less likely to cause harm? If you are a person with a decently functioning moral-reasoning device, “yes” is probably your answer. Harm is not the only relevant factor either. Some drugs (e.g. Psilocybin, LSD, and MDMA) can produce insightful and interesting effects on the mind that expands, rather than numb down, one’s own conscious experience. Sam Harris puts it nicely:

“Needless to say, if I knew my daughter would eventually develop a fondness for methamphetamine or crack cocaine, I might never sleep again. But if she does not try a psychedelic like psilocybin or LSD at least once in her adult life, I will worry that she may have missed one of the most important rites of passage a human being can experience.”