

## Marijuana and Memory

The illegal and legal use of marijuana is widespread, and for millions of people all over the world, it is their recreational drug of choice. Marijuana is by far the most widely available street drug and the compound of THC in cannabis reportedly causes pleasure and euphoria among users. Although marijuana use is most popular among teenagers and young adults, usage among older adults is prevalent well into middle age. This is especially true with medical marijuana, which is now legal in twenty states and is used widely for relief of pain, control of epilepsy, help with nausea for chemotherapy in cancer patients, and a whole host of other ailments. But how dangerous is marijuana and what effects does it have on memory and basic functioning? Does marijuana irrevocably damage the maturing brain in young people and act as a precursor for psychotic behavior and conditions such as schizophrenia? Does marijuana affect I.Q.? And finally, does the widespread legality of marijuana and ensuing problems with perception and memory lead to reckless behavior, with disregard for physical and mental health, especially leading to irresponsible and dangerous driving behind the wheel?

This scope of this analysis will focus on marijuana's implications for memory and cognitive abilities including IQ and the predilection for chronic disease such as schizophrenia, the harm that marijuana has on development of the development of adolescent brains and the social ramifications of that harm, and

finally, with the advent of medical marijuana, how cognitive deficits affect driving and performing simple tasks, i.e., the long term implications for marijuana use.

The research is conclusive when it comes to cognitive difficulties with marijuana, it does impair memory, especially working memory or short-term memory. Working memory is responsible for managing immediate and current information used for reasoning, perception, and comprehension. Short-term memory affects verbal intelligence, reaction time and the completion of tasks simultaneously or multi-tasking (Smith, Longo, Fried, Hogan, Matthew, & Cameron, 2010). Using science in layman's terms, marijuana negatively affects memory by attacking neurons related to memory in the brain, causing them to collapse and shrink thus causing disability.

Marijuana usage affects the frontal lobe of the brain, which affects making decisions and solving problems and in turn causes attention and response difficulties. The research used MRI technology to monitor blood flow to the affected areas. Cannabis use, in short, decreases overall mental flexibility. Two distinctions are important here, first, the age in which the individual started smoking marijuana was an important factor, and second, how much marijuana is smoked per week. In most studies, the targets studied were primarily heavy users of cannabis with some exceptions. By far, the overwhelming opinion was that the younger use or abuse was started, the worse the memory and related cognitive problems.

Regarding marijuana affecting overall I.Q the research is mixed, but mostly erring on the side that cannabis does affect I.Q. negatively as far as testing and performance goes. This is because cannabis users often do poorly on the memory and verbal sections of an I.Q. test. Long-range studies have shown that individuals who used cannabis from an early age saw a downward spiral in I.Q. scores for a period of twenty-five years. This trend was true even for those individuals who has stopped smoking cannabis years before. Scientists say cannabis use permanently weakens the network of specific memory brain neurons and causes them to collapse on themselves, causing cognitive problems. Many researchers hold that short-term memory loss as well as other cognitive difficulties, directly affects intelligence (Dougherty, Mathias, Dawes, Furr, Liguori, Shannon & Acheson 2013). The latter researchers believe that I.Q. is at risk because the ability of the mind to properly assign importance to life's events and to memorize items and numbers in a sequence directly affects the ability to solve problems. And this is true with both verbal problems and numerical problems. Of course, whether this problem is short term, and goes away with discontinued use of cannabis is an area for further study. One important component of measuring intelligence is the age at which a given individual started using cannabis. The earlier an individual used the drug, the more pronounced the memory loss and motor function is (Hanson, Lucian 2010). Low I.Q. has huge ramifications on a young person's self esteem and affects performance in school, performance in a job as well as future job choice and success, the hallmarks of a young person's future.

Another topic under discussion in the research is whether marijuana use and the resulting loss of memory, perception, and motor function among young teens can go a step further and precipitate mental illness, including psychotic disorders such as schizophrenia. In short, can marijuana permanently damage the brain? Schizophrenia usually strikes younger people and because a disproportionate number of people with Schizophrenia have and continue to smoke marijuana, corresponding studies have been made. The literature is divided as to whether there is already a genetic factor present that could cause mental illness or if marijuana itself causes the break in mental functioning (Balderston, Rhea, & Crockford, 2014). There is similar brain activity in people with schizophrenia and those with chronic marijuana abuse, and schizophrenia shares many of the same tenants of marijuana use, loss of short-term memory, attention problems, problem-solving difficulties and reaction time (Stern, 2014). The results most often conclude that underlying illness factors and genetics were present prior to marijuana use, but that cannabis use, with this particular affliction, makes the symptoms worse (Malchow, Hasan, Fusar-Poli, Schmitt, Failai, & Wobrock 2014). The debate on this topic is still ongoing.

The final issue concerns how marijuana use affects society as a whole. With the proliferation of medical marijuana, legal now in twenty states and totally legal in two, Washington and Colorado, and the fact that marijuana usage grows exponentially every year, there are dire consequences concerning health, and specifically on reckless driving behind the wheel. The fact that medical marijuana is more powerful now because of plant manipulation is troubling. The

diminishment of short-term memory and impaired judgment, poor decision making, decreased motor function and planning that cannabis users demonstrate in test after test lead to high risk behaviors that aren't rational, and have huge implications on mental and physical health. Surprisingly, smoking a marijuana cigarette is ten times more damaging to the lungs than smoking one tobacco cigarette and chronic use can cause lung cancer. And despite large-scale drug prevention campaigns that start in grade school, the use of marijuana has not decreased. Marijuana users show little concern for the potential dangers of marijuana and only describe the positive effects of the drug (Alfonso & Dunn, 2007). In other words most users do not think of the future and possible dangers of the drug.

Besides lack of concern regarding physical or mental health, individuals under the influence of marijuana take part in dangerous sexual behavior, have poor performance in school with a growing drop out rate (the batteries of tests telling students they are "less than" don't help), and tend to drive recklessly, having trouble changing lanes and braking at an appropriate time, endangering both themselves and others. There are serious, potential life-threatening problems when individuals drive under the influence of marijuana. The poor spatial memory, lack of flexibility, lack of movement coordination, lack of good motor function, and poor reaction time, leads to accidents and driving poorly because of poor coordination (Penning, Veldstra, Daamen, Oliver, & Verster 2010).

Marijuana does indeed cause short-term memory deficits and an array of cognitive deficits as well. Marijuana use also negatively affects I.Q and test

taking in the areas of short-term memory and perception. In addition, marijuana complicates the issue of further mental illness, and brain development. Finally, marijuana use causes individuals to exhibit risky behavior, disregarding mental and physical health. The latter point especially predicts poor driving performance and places individuals, under the influence of marijuana, in serious danger of having or causing traffic accidents. A question this study invites is whether the discontinuation of marijuana use stops the short-term memory deprivation, perception difficulties, and cognitive deficits so common in users of cannabis. Many researchers say memory loss is permanent and I.Q. loss is persistently lower than with individuals who have never used marijuana. No matter what the further studies of the permanence of marijuana use prove, the fact that marijuana usage, especially with chronic use and individuals beginning at an early age, is a deterrent to the maturation of young minds and causes serious memory and perception problems that seriously affect a young person's array of choices for the future.