

Marijuana's Impact on Learning: GPA and Beyond

"The legalization of Marijuana for recreational and medical uses has altered the way we perceive the use of the weed. In our United States, "thirty-three states and the District of Columbia currently have passed laws broadly legalizing marijuana in some form. The District of Columbia and 11 states -- Alaska, California, Colorado, Illinois, **Maine**, Massachusetts, Michigan, Nevada, Oregon, Vermont and Washington - have adopted the most **expansive laws legalizing marijuana for recreational use**. Most recently, Illinois became the second most-populous state to legalize recreational marijuana after Gov. J.B.



Pritzker signed a bill passed by the legislature. Vermont earlier became the first state to legalize marijuana for recreational use through the legislative process, rather than via a ballot measure. Vermont's law allows for adults age 21 and over to grow and possess small amounts of cannabis. However, it does not permit the sale of nonmedical cannabis. Some other state laws similarly decriminalized marijuana, but did not initially legalize retail sales. Most other states allow for limited use of medical marijuana under certain circumstances. Some medical marijuana laws are broader than others, with types of medical conditions that allow for treatment varying from state to state. Louisiana, West Virginia and a few other states allow only for cannabis-infused products, such as oils or pills. A number of states have also decriminalized the possession of small amounts of marijuana"

To learn more and view the map depicting current state laws and recently-approved ballot measures legalizing marijuana for medical or recreational purposes, visit GOVERNING website: [State Marijuana Laws 2019](#)

"At the federal level, marijuana remains classified as a Schedule I substance under the Controlled Substances Act, where Schedule I substances are considered to have a high potential for dependency and no accepted medical use, making distribution of marijuana a federal offense" ([National Conference of State Legislatures](#)). Simply put, "**under federal law, "recreational and medical use" of marijuana is illegal**. Marijuana remains classified as a Schedule I Controlled Substance, meaning it has: •no currently accepted medical use in the U.S., •a lack of accepted safety for use under medical supervision, and •a high potential for [misuse] ([Drug Enforcement Agency- Marijuana Use amongst College Students](#)). **Institutions receiving federal funding must comply with federal law, even if marijuana legalization has occurred in the state in which the institution exists.**

"Marijuana is the most commonly used illicit drug in the United States. Its use is widespread among young people. In 2015, more than 11 million young adults ages 18 to 25 used marijuana in the past year. According to the [Monitoring the Future](#) survey, rates of marijuana use among middle and high school students have dropped or leveled off in the past few years after several years of increase. **However, the number of young people who believe regular marijuana use is risky is decreasing. This belief is supported by the legalization of Marijuana" ([NIH-Drug Facts](#)).**



The article; *The Academic Consequences of Marijuana Use during College* published in *Psychological Addicted Behaviors* (2015); reports “Marijuana use is common among college students in the United States, with one in three using within the past year ([Johnston, O’Malley, Bachman, Schulenberg, & Miech, 2014](#)) and 19.8% reporting past-month use ([Substance Abuse and Mental Health Services Administration, 2014](#)).

There is a belief amongst college students that marijuana is a means to cope with **anxiety**, however in a national research survey organized by American College Health Association National College Health Assessment (ACHA-NCHA), three hypothesis were examined.

“The first hypothesis 1). Students who reported experiencing anxiety symptoms within the past 30 days would be significantly more likely to endorse marijuana use within the same time frame than those without anxiety and second 2). Students who acknowledged having anxiety symptoms within the past 30 days, those who had not received any formal anxiety treatment would be significantly more likely to endorse marijuana use within the past 30 days than those who did receive such formal treatment. The third hypothesis assumed a significant negative correlation would occur between current marijuana use and grade point average (GPA) among students with anxiety who were not receiving formal anxiety treatment”

Hypothesis number one was not supported. “Among the student sample, those with current anxiety were no more likely to have recently used marijuana than those without anxiety”.

Hypothesis number two was not supported. “Students who were not receiving formal treatment for their anxiety were no more likely to currently use marijuana than those receiving formal treatment “

Hypothesis number three was supported. “Students with current anxiety yet **without any such formal treatment**, marijuana use was negatively correlated with GPA”

To learn more: [Assessing Marijuana Use, Anxiety, and Academic Performance Among College Students](#)

“Peer-reviewed, published [research](#) has compellingly demonstrated that the more students report using marijuana, the more they **skip classes**, have **lower GPAs**, have **enrollment gaps**, and **do not graduate on time**. Another [study](#) published in the journal *Drug and Alcohol Dependence* concurs stating college students who use marijuana have lower GPAs than those who do not and are more likely to drop out and less likely to graduate on time. Finally, [research](#) published last year in *PLOS ONE* **found a significant decline in GPAs over two years when students used both marijuana and alcohol at moderate to high levels**. In short, these studies found that **marijuana use by college students is incongruous with student success**” ([Higher Education Today](#))

Subjects with a history of daily marijuana use had brain abnormalities and showed a pattern of poor performance on a series of tests of working memory.



“The mechanisms underlying the association between marijuana use and poor educational outcomes are most likely very complex and not completely understood. **Marijuana use, particularly heavy use, has been shown**

to affect working memory, learning, and information processing; functions that are necessary for academic performance ([Crean, Crane, & Mason, 2011](#); [Jager, Block, Luijten, & Ramsey, 2010](#); [Solowij et al., 2011](#)). **Additionally, long-term, heavy use of marijuana has been linked to long-term changes in the structure of the brain, including the hippocampus, prefrontal cortex, and amygdala** ([Battistella et al., 2014](#); [Churchwell, Lopez-Larson, & Yurgelun-Todd, 2010](#); [Hall, 2015](#); [Volkow, Baler, Compton, & Weiss, 2014](#); [Yücel et al., 2008](#)). **These changes are associated with impairments in information processing, IQ, memory, attention, and neurocognitive performance** ([Block et al., 2002](#); [Bolla, Brown, Eldreth, Tate, & Cadet, 2002](#); [Fontes et al., 2011](#); [Medina et al., 2007](#); [Meier et al., 2012](#); [Solowij et al., 2002](#)), **and these effects can remain even after several weeks of abstinence** ([Bolla et al., 2002](#); [Medina et al., 2007](#); [Schweinsburg et al., 2008](#)).

It is possible that these neurocognitive effects of marijuana could contribute to academic problems among marijuana-using students, especially if use begins during adolescence and is regular and heavy ([Fontes et al., 2011](#); [Volkow et al., 2014](#)). [Brook, Stimmel, Chenshu, and Brook \(2008\)](#). Research has discovered that early onset of marijuana use was associated with lower levels of academic functioning at age 27. A possible link between marijuana use and amotivation has been suggested ([Bloomfield et al., 2013](#); [van Hell et al., 2010](#)), which could contribute to a lack of engagement in college and difficulties in sustaining a focus on academic pursuits. Skipping classes is a possible manifestation of the lack of commitment to one’s academic life during college and could also be exacerbated by the acute neurocognitive effects of marijuana smoking or withdrawal symptoms associated with more regular use.

Changes in such academic behaviors (i.e., missing classes, studying less) appear to play a role in explaining the relationship between excessive drinking and academic performance ([Powell, Williams, & Wechsler, 2004](#); [Williams, Powell, & Wechsler, 2003](#); [Wolaver, 2002](#)), and it is plausible that similar mechanisms might occur with marijuana use. ([Jones, Oeltmann, Wilson, Brener, & Hill, 2001](#); [O’Grady, Arria, Fitzelle, & Wish, 2008](#); [Wechsler, Dowdall, Davenport, & Castillo, 1995](#)), and use of other drugs is common among marijuana users ([Mohler-Kuo, Lee, & Wechsler, 2003](#)).

HOW MARIJUANA AFFECTS YOUR BODY

CHEMICALLY

ACTIVE CHEMICALS :

- ① TETRAHYDROCANNABINOL
- ② CANNIBIDIOL
- ③ CANNIBINOL

BRAIN FUNCTIONS AFFECTED :

- MENTAL STATE**
Lethargy, anxiety, paranoia
- SHORT TERM MEMORY**
Sense of alteration
- OCULAR PRESSURE**
Reduces intra-ocular pressure, dryness creates red eyes
- REASONING**
Altered visuospatial reasoning and effects on attention

PHYSICALLY

WHILE SMOKING YOU'LL FEEL...

- euphoria
- relaxation
- DEPENSUBILIZATION
- increased appetite

AND LATER

- RESPIRATORY & CARDIOVASCULAR PROBLEMS
- MEMORY & INTELLIGENCE DISRUPTIONS

DRY MOUTH
Compounds impede saliva production

HEART RATE INCREASE
THC is considered to be anxiety-producing

FUTURE LUNG OBSTRUCTION
Increased risk of developing chronic obstructive lung disease in smokers

PSYCHOLOGICALLY

ALTERED SENSE of TIME

The neurochemically altered state of mind marijuana produces causes the user's perception of time to become unclear

ALTERED SENSE of SPACE

Marijuana usage does have real effects on how users experience their environment, causing problems with coordination

VARIATIONS in MOOD

Although unproven, many long term studies indicate that users with certain risk factors face possibility of depression and schizophrenia

SOURCES

METRICK J, KAHLER CW, MCKEARY JE, MURPHY PA, ROBINSON DJ
"Acute effects of marijuana smoking on negative and positive affect"

LIQUORI ANTHONY, GATTO C P, ROBINSON J H
"Effects of marijuana on equilibrium, psychomotor performance, and driving"

JONES RT
"Cardiovascular system effects of marijuana"

SCIENCEBAILY
"Study Finds No Link Between Marijuana Use And Lung Cancer"

CLARK R R
"Marijuana Use Associated With First Episode of Psychiatric Illness"

TAN WC, LO C, JONG A, ET AL
"Marijuana and chronic obstructive lung disease"

DESIGNED BY ASHWIN ANANDHAN

When examining the complex relationship between marijuana use and academic performance, it is therefore critical to account for the **concurrent use of alcohol and other drugs.**

Moreover, mental health problems often **co-exist with marijuana and other substance use, especially anxiety and depression** ([Armstrong & Costello, 2002](#); [Pottick, Bilder, Vander Stoep, Warner, & Alvarez, 2007](#); [Sheidow, McCart, Zajac, & Davis, 2012](#)). These mental health problems have been found to independently contribute to academic problems among college students ([Arria et al., 2013a](#); [Eisenberg, Golberstein, & Hunt, 2009](#); [Hunt et al., 2010](#)). [Eisenberg et al. \(2009\)](#).

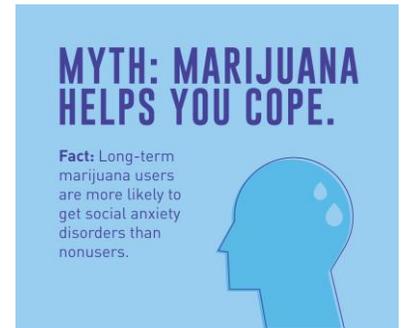
Depression, and especially depression-anxiety comorbidity, was associated with decreased GPA among college students, and [Arria et al. \(2013a\)](#) found that depressive symptoms were associated with a gap in enrollment during the first two years of college”).

To read this abstract: [The Academic Consequences of Marijuana Use during College](#)

Beyond College

Long Term effects of Marijuana use;

- Marijuana can affect brain development. When people begin using marijuana early in their lives, the drug may impair thinking, memory, and learning functions and affect how the brain builds connections between the areas necessary for these functions.
- People who started smoking marijuana heavily in their teens and had an ongoing marijuana use disorder lost an average of 8 IQ points between ages 13 and 38. The lost mental abilities didn't fully return in those who quit marijuana as adults.



Source: The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research

“Marijuana use and other illicit drug use are both associated with a decreased likelihood of continuous enrollment in college, independent of several other possible risk factors. These findings highlight the need for early intervention with illicit drug users to mitigate possible negative academic consequences”

Drug Use Patterns and Continuous Enrollment in College: Results From a Longitudinal Study

“Chronic, heavy marijuana use can impact cognitive functioning, which has the potential to influence academic performance of college students. Studies have shown that the **craving [alone] for marijuana may further contribute to diminished cognitive and affective functioning, thus leading to poor outcomes for students**” (online: [Marijuana use, craving, and academic motivation and performance among college students: An in-the-moment study.](#))

✦ When smoked, marijuana induces a feeling of euphoria (a 'high') almost instantly. The drug stimulates brain cells to release the reward chemical dopamine - the same pleasure centres targeted by other drugs such as heroin, alcohol and cocaine.

Cannabis also affects a brain receptor responsible for regulating hunger, C1BR - causing sudden hunger known as 'the munchies'. In effect, the drug 'reverses' the signal in the brain which normally tells you that you're full and you should stop eating - making smokers feel like they're hungry.

✦ The drug also increases heart rate by between 20% and 100%, an effect which lasts up to three hours after a user has smoked a joint. Many users report feeling relaxed, but others can feel panicky or paranoid.

✦ THC - the chemical in cannabis which causes the 'high' - attaches to cannabinoid receptors in the brain. These are found throughout the brain, including areas which regulate coordination, movement and memory. This leaves users unable to operate machinery, drive safely, and remember what they're doing.

After around two hours, levels of THC in the bloodstream start to drop - leaving users feeling tired, and sometimes depressed. While the drug doesn't cause withdrawal, it can lead to addictive behaviour, with up to 10% of users consuming the drug in a problematic way.

Cannabis is 'lipophilic', meaning it dissolves in fat in the body. This means traces of the drug can remain in the body for far longer than other drugs such as cocaine - leading to users failing drug tests up to 10 days after smoking a joint.

METRO

Our students are here to expand their minds, increase their knowledge and build their futures. They are the leaders of tomorrow. With marijuana use among U.S. college students on the rise it is important for our students to understand their risk.

There has been a dramatic increase in the vaping of marijuana on college campuses. “In 2018, 43% of full-time college students aged 19-22 reported using marijuana at least once in the prior 12 months (annual prevalence). The five-year trend, from 2013 to 2018, increased a statistically significant 7 percentage points. Twenty-five percent reported using at least once in the prior 30 days (30-day prevalence), showing a significant increase over the past five

years. Both of these prevalence levels are at historic highs since 1983, when they were 45% and 26%, respectively.

Thirty-day prevalence of vaping marijuana also increased for college students from 5.2% in 2017 to 10.9% in 2018, a significant 5.7 percentage point increase. Among noncollege respondents, 30-day prevalence was level at 8% in 2017 and 2018.

“This doubling in vaping marijuana among college students is one of the greatest one-year proportional increases we have seen among the multitude of substances we measure since the study began over 40 years ago,” said John Schulenberg, principal investigator of the Monitoring the Future Panel Study”

To read more: [Marijuana use among US college students reaches new 35-year high.](#)

Being Legal doesn't mean safe

When something becomes legal, this doesn't mean the risk was eliminated.

Alcohol is legal and is not without risk. Prescription drugs are legal and even when prescribed, there is risk.

Nicotine is widely used and legal. It is a very powerful drug and very risky.

Marijuana is no different. Because it has been legalized in many states does not mean it is not without risk.

It's important to understand risk ... **Choices Matter.**



For Comments on this, newsletter or suggestions for future articles please contact:

Diane Geyer, LCPC, LADC, CCS, NCC~ Coordinator of Clinical Substance Use Services at USM~

207-780-4050 Email: diane.geyer@maine.edu