The Misclassification of Medical Marijuana

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Marijuana has a complicated legal, social, and economic history in the United States, as well as an uncertain future. Marijuana has been consistently tied to racial minority groups since its arrival in the United States in the 1900s, and former Attorney General Jeff Sessions further propagated that notion. AG Sessions even recently wrote a memo that directly contradicted Obama-era policy, demonstrating that the current legal status of marijuana in both state and federal government is currently up for debate. While several states have legalized marijuana for medical or even recreational purposes, federal law still categorizes cannabis as a drug with no currently accepted medical use and a high potential for abuse. The comparison between marijuana, opioids, and ketamine in this article demonstrates that marijuana has been unnecessarily withheld and stigmatized by the federal government. Also reviewed is the impact of stringent marijuana-based legal policies upon the racial makeup of prison populations. The implications of current policy upon potential and future research are also discussed, with the determination that current policy has stymied research and prevented a more accurate determination of the risks and benefits of medical marijuana.

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Marijuana has a complicated legal, social, and economic history in the United States, and the issue of legalization has not yet been resolved. This article will comment upon the legal status of only medical marijuana, but it will discuss the potential risks of both medical and recreational marijuana to allay the fear that the legalization of medical marijuana poses a significant threat to public health. While several states have legalized marijuana for medical or even recreational purposes, federal law still categorizes marijuana as a drug with no currently accepted medical use and a high potential for abuse.[1] While the legalization of medical marijuana in several states prompted the federal government to reevaluate the status of marijuana, the U.S. Drug Enforcement Administration (DEA) reaffirmed the status of marijuana as a Schedule I drug in 2016, citing lack of evidence of efficacy.[2] This decision demonstrated, however, not a realistic evaluation of the risks and benefits of marijuana, but a demonstration of the current catch-22 within American legal policy regarding marijuana: namely, that few risks have been demonstrated and few benefits have been studied. The federal government has restricted access to marijuana on the basis of its unknown risks and lack of proven benefits despite the fact that synthetic cannabinoids have been demonstrated to elicit FDA-approved benefits.

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Marijuana in the United States of America: 1900–2018

Cannabis was initially marked as Schedule I for reasons related to race and class. Other drugs were associated with other racial minorities, such as the mythical linkage between Chinese men, opium, and the seduction of white women that eventually led to the 1909 Opium Exclusion Act.[3,4] Marijuana has been typically associated with negative racial stereotypes about both African Americans and Mexicans, as well as other Latin-American immigrants.[4] The wave of anti-marijuana legislation that led to the categorization of cannabis as a Schedule I drug dates back to the early 1900s, when one member of the Texas Senate stated on the floor, "All Mexicans are crazy, and this [marijuana] is what makes them crazy."[5] California was the first state to prohibit marijuana in 1913, with Texas following suit in 1914.[2] The federal government soon caught the anti-drug bug, and in 1915 the U.S. Secretary of Agriculture used the 1906 Pure Food and Drug Act to declare marijuana importation illegal based on the threat it posed to health.[4,5] A famous 1927 *New York Times* article entitled "Mexican Family Go Insane," proposed that "a widow and her four children have been

driven insane by eating the marihuana plant, according to doctors."[5] The period of 1933–1937, notably marked by the production of the infamous anti-cannabis film *Reefer Madness* in 1936, thus saw almost every state enforce the Uniform Narcotic Drug Act, thereby increasing the strength of policing for marijuana and other drugs.[3,5] In 1937, Congress created the federal Marihuana Tax Act, which forbade recreational and unlicensed use of cannabis.[3] Later laws established in 1951 and 1956 increased federal control on marijuana and foreshadowed the establishment of the Comprehensive Drug Abuse and Prevention and Control Act of 1970, better known as the Controlled Substances Act, by the Nixon Administration.[6] A former Nixon aide tied the Controlled Substances Act directly to the politics of race, stating, "the Nixon White House . . . had two enemies: the antiwar left and African American people. . . . By getting the public to associate the hippies with marijuana and African Americans with heroin, and then criminalizing both heavily, we could disrupt those communities."[7] Since the 1970s, the scheduling of drugs into different risk-based categories has presented various ethics, legal, and medical issues. While the Controlled Substances Act has worked to fight drug abuse and addiction, marijuana does not present the high risk level of a Schedule I drug and should not be classified as such.

Attorney General Sessions started to reverse Obama-era policies that allowed for the state-by-state legalization of medical marijuana. In 2013, then-Deputy Attorney General James Cole issued a memo limiting prosecution to "the most significant threats in the most effective, consistent, and rational way."[8] Essentially, Deputy AG Cole encouraged the federal government to leave the regulation of medical and recreational marijuana to the states that implemented policies of legalization.[8] Following this shift in federal policy, a bipartisan bill was proposed by Florida senators Matt Gaetz (Republican) and Darren Soto (Democrat) in April 2017 to recategorize marijuana as a Schedule III drug.[9] A January 4, 2018, memo written by AG Sessions, however, essentially reneged on the Obama-era policy.[10] This new memo directly contradicted the Deputy AG Cole's memo, although it did not contradict a later memo from 2014 discouraging the prosecution of money made from the sale of legal marijuana.[10,11] Because of AG Sessions' stance on cannabis, the future of medical marijuana in the United States is currently uncertain.

A Brief Discussion of the Schedule System

The federal government classifies drugs into several different categories, known as Schedules I–V. This article will largely focus on Schedules I–III. Schedule I drugs are currently defined, as described above, as having no currently accepted medical use and a high potential for abuse.[1] Along with marijuana, heroin, lysergic acid diethylamide (LSD), 3,4-methylenedioxymethamphetamine (ecstasy), and peyote have been classified as Schedule I.[1] Cannabis is not the only drug on this list to have potential medical use; LSD, for example, has recently been considered for use as an antidepressant or anxiolytic.[12]

Schedule II drugs, on the other hand, have at least one already proven, efficacious medical use, with "a high potential for abuse, with use potentially leading to severe psychological or physical dependence. These drugs are also considered dangerous."[1] Schedule II includes some unexpected drugs, such as cocaine and crystal methamphetamine, as well as most opioids, amphetamine/dextroamphetine salts (Adderall™), and methylphenidate (Ritalin™).[1] Cocaine is a Schedule II drug because of its approved medical use as a local anesthetic, despite its lengthy history of abuse;[6] methamphetamines can suppress appetite in obese patients and are legally prescribed to stabilize severe attention-deficit hyperactivity disorder (ADHD) symptoms in children over the age of six.[13] Adderall™ can be prescribed to children ages three or above.[14] Nabilone (Cesamet™), a synthetic oral cannabinoid derived from marijuana, has also been classified as Schedule II due to its use as an antiemetic.[15]

Finally, Schedule III drugs maintain "a moderate to low potential for physical and psychological dependence. Schedule III drugs abuse [sic] potential is less than Schedule I and Schedule II drugs but more than Schedule IV."[1] Schedule III drugs include ketamine, testosterone, and anabolic steroids.[1] A second synthetic cannabinoid and marijuana derivative, dronabinol (Marinol™), resides on the list of Schedule III drugs for its use as an appetite stimulant and antiemetic.[16] The federally defined schedules have been enumerated here to provide a context for the comparison among the schedules of marijuana, opioids, and ketamine.

Marijuana, Opioids, and Ketamine: Side Effects

Because marijuana is currently classified as a drug with no medical use, studies that discuss medical marijuana are limited in both number and scope. Many studies compare smoking habits and respiratory distress among cigarette and cannabis smokers, as well as symptoms of abuse and addiction in recreational users, but few address the side effects of medical marijuana.[17] One study in Canada described the most common side effects of cannabis use in patients with non-chronic cancer pain as a "high" and dry mouth.[18] In the United States, nabilone may produce a similar "high" or psychiatric symptoms, hypo- and hypertension, and tachycardia if the prescribed dosage is too high.[15] Dronabinol has also been associated with a "high," sleepiness, or withdrawal symptoms lasting up to 48 hours that appeared in only one study, which promptly stopped dispensing the medication.[16] The categorization of cannabis as Schedule I, therefore, is a double-edged sword: because few clinical trials have been run, few negative side effects have been reported.

Both opioids and ketamine, however, have far more significant side effects than those currently reported for marijuana. One study entitled "Opioid Complications and Side Effects" enumerated a list that included symptoms ranging from nausea and vomiting to respiratory depression, muscle rigidity, and immunological and hormonal dysfunction.[18] Many of these side effects can be mitigated by changing the type of opioid and route of administration, as well as proper patient screening and education.[18] One article also argues that the importance of respiratory depression has been exaggerated; however, the list of symptoms is still extensive.[19] Ketamine has its own list of side effects, which includes hallucinations, memory defects, nausea, panic attacks, cardiovascular stimulation, and hepatotoxicity.[20] While a similar comparison between ketamine and recreational marijuana use would point out that marijuana abusers face respiratory risks, side effects have not been seen in a clinical setting.[19] Still, the contrast between the currently known side effects of medical marijuana, opioids, and ketamine should be noted.

Marijuana, Opioids, and Ketamine: Abuse and Addiction

All three drugs discussed in this article place users at great risk for abuse and addiction; however, marijuana presents less potential for abuse than ketamine and less risk of addiction than opioids. Ketamine was labeled as an unscheduled drug until 1999, despite its potential for both addiction and serious abuse.[21] Ketamine, also known as "Special K, K, Kit Kat, [and] Cat Valium," among other names, is well known for its use as a party drug and date rape tool, two facts that seem to go hand in hand, as gamma-hydroxybutyrate (GHB) also fits both categories.[22–24] Ketamine can cause death directly, through interactions with other depressants, anesthetics, or sedatives, or indirectly, through risky behavior while under the influence.[22] Marijuana, on the other hand, can cause death indirectly through the disinhibition of risky or dangerous behaviors, but it has never yet been the direct cause of death.[25] Both marijuana and ketamine have also been associated with psychosis and can interact with other factors and facilitate the development of schizophrenia in a small number of users.[26,27] Abuse of both drugs can lead to addiction, and both cause symptoms of physical and mental withdrawal.[28,29] Marijuana abuse, however, does not lead to significantly higher rates of addiction or significantly worse withdrawal than ketamine.[30] Because marijuana presents a lower risk of abuse than ketamine, as well as equal or even less risk of addiction, it should be treated as a similar, or even less dangerous, drug.[30]

Given the current state of the opioid epidemic in the United States, marijuana clearly presents less risk of abuse and death. Opioids were classified as Schedule III drugs until 2014, making the comparison between the current legal classification of marijuana and opioids even starker.[31,32] While it is sometimes difficult to separate the role of heroin, a Schedule I opioid, from that of opioids now classified as Schedule II, fentanyl, a well-known player in the opioid epidemic, is a Schedule II drug used to treat severe pain.[31,33] The opioid epidemic took 52,404 lives in America in 2015, and data demonstrate that 20,101 overdose deaths resulted from prescription pain relievers.[31] In addition, opioid prescriptions often lead to heroin use, with four out of five new heroin users having misused prescription painkillers in the past.[31] While many other reports describe the statistics more thoroughly, opioids clearly represent a significant threat to both life and health. Marijuana, on the other hand, causes addiction. Approximately 4.0 million people in America qualified for marijuana use disorder in 2015.[34] Yet marijuana has never been

the direct cause of death for any of these patients, and animal research demonstrates that marijuana dependence occurs under a narrower range of conditions than that of opiates. Marijuana has even been offered as a potential solution to the opioid epidemic.[35]

Marijuana, Opioids, and Ketamine: Medical Benefits

Cannabis is the most difficult drug of the three groups to analyze because the federal guidelines that result from its status as a Schedule I drug have stifled marijuana research.[36] The National Institute on Drug Abuse (NIDA) has currently established one location for the legal growth of marijuana for testing and research at the University of Mississippi, creating a more significant bottleneck on marijuana production than that of any other Schedule I drug.[34] NIDA, however, has done little to reduce that bottleneck since 2015.[34] The Department of Health and Human Services also stopped accepting patients for its previous compassionate use programs in 1992.[34] Given the difficulties associated with marijuana research, not enough has been done to find new medical uses of cannabis, or to provide scientific evidence that either proves or disproves proposed hypotheses about the treatment or palliation of patients with multiple sclerosis (MS), epilepsy, and other disruptive diseases. Ketamine and opioids, on the other hand, have been extensively studied. The medical benefits of these drugs may therefore appear far more significant and more thoroughly vetted than those of marijuana, even though marijuana has the potential to treat many different diseases.

Marijuana is currently under study for far more than its well-established antiemetic properties.[37] One of the most promising areas of research involves epilepsy. Various case studies have described a decrease in the seizures in epilepsy patients, even highly treatment-resistant patients, who use marijuana.[36] Cannabidiol (CBD), the compound believed to be largely responsible for this effect, has not been synthetically produced as a separate compound like dronabinol or nabilone, both types of cannabinoids.[38] CBD, unlike cannabinoids, does not produce the "high" associated with marijuana; in addition, the drug has the potential to treat a range of psychiatric disorders, from anxiety to depression and even psychosis.[39,40] Perhaps cannabidiol could be synthesized as a separate compound like dronabinol or nabilone someday. For now, however, CBD merely has the potential to treat a number of diseases. The removal of marijuana from the list of Schedule I drugs would enable further testing of the antiepileptic and antidepressant effects of marijuana. A shift from the current method of case studies to the more statistically significant randomized controlled trials, in particular, could support or disprove the benefits of CBD and medical marijuana in general.

Marijuana has also been shown to treat both chronic and neuropathic pain. While many suspect that the opioid epidemic was caused by the prescription of opioids to manage chronic pain, marijuana does not pose the same threat to life or health with regard to chronic pain treatment.[40,41] In comparison to the research on epilepsy, studies on chronic and neuropathic pain are far more thorough. One study, for example, describes the benefits of marijuana on both chronic and neuropathic pain, as well as spasticity, due to multiple sclerosis.[38,41]

Research related to multiple sclerosis is much more thorough than that for epilepsy due to the FDA approval of dronabinol and nabilone.[38,40–43] Because these drugs were synthesized as separate compounds, they cannot represent the full potential of marijuana; however, they demonstrate that the benefits of these two cannabinoids go far beyond their antiemetic effects. The American Academy of Neurology combined cannabidiol with Δ(9)-tetrahydrocannabinol (THC), another marijuana-derived compound that is not FDA-approved, to produce a nasal spray called nabimixone.[38] The systematic review of this agent demonstrated possible benefits to "treating spasticity, central pain, and urinary dysfunction associated with multiple sclerosis."[38] Several other trials, including one in Canada, demonstrated the benefit of medical marijuana for patients with MS.[41] This research demonstrates a significant opportunity to better the lives of patients with MS, as well as other sufferers of chronic and neuropathic pain.[43]

Marijuana has also been shown to have anti-inflammatory and immunosuppressive effects that could prove beneficial to patients who suffer from hyperactive immune systems.[40] Patients with MS could benefit from this treatment, as could patients with diabetes, rheumatoid arthritis, and allergic asthma.[40] Cannabinoids, in particular, have an apoptotic effect on immune cells, because the cannabinoid receptor 2 largely appears on immune cells, and

both synthetic and natural cannabinoids can activate those receptors.[40] This effect, however, is weak, and both THC and cannabidiol may also play a role in the immunosuppressive response through a non-cannabinoid receptor mechanism.[39] While the immunosuppressant mechanism is not well understood, it represents merely one of many potential benefits that the medical research, let alone the use, of medical marijuana has to offer.

Opioids, on the other hand, only have use for short-term or perhaps for carefully regulated long-term pain treatment. While they can successfully be used to treat chronic pain, the risk of addiction is so great that non-opioid therapy should be given preference except in the instance of terminally ill patients.[44] Opioids provide well-established benefits for those who suffer from short-term pain, however.[45] While the use of opioids for short-term or even chronic pain is both thoroughly documented and very important, the current focus has shifted from expanding opioid use to curbing its rampant spread.

Ketamine, like marijuana, is undergoing research to demonstrate beneficial new uses of a familiar drug. Ketamine has been used as an anesthetic since 1970, and it is still used as an anesthetic for shocked or hypotensive patients in emergency care settings, to treat patients with reactive airway diseases, and in many other situations.[43] Similar to marijuana, ketamine has demonstrated anti-inflammatory effects, downregulating macrophages through an as-of-yet unknown mechanism.[40] Ketamine can also be used to treat both chronic and neuropathic pain because "the evidence for efficacy of ketamine for treatment of chronic pain is moderate to weak. However, in situations where standard analgesic options have failed, ketamine is a reasonable 'third line' option."[39] The evidence for neuropathic pain treatment is far stronger, although ketamine is not the first choice for neuropathic pain.[46] Ketamine is an NMDA-receptor antagonist, so it downregulates the hyperactive NMDA receptors responsible for chronic pain.[47] Ketamine has even been used to treat opioid abuse and withdrawal symptoms.[48] Recently, ketamine has been demonstrated to have potent anti-depressant effects in treatment-resistant patients.[49] Ketamine has also been proven effective as a treatment for posttraumatic stress disorder (PTSD) and obsessive-compulsive disorder (OCD), and shows potential for anxiety disorders.[50] Ketamine, like marijuana, has significant potential as a treatment for a multitude of different diagnoses.

Real-World Application

One benefit of future research on marijuana is that researchers will learn not only about the medical benefits of marijuana, but also the ways in which the drug is currently being misused. On one episode of "Last Week Tonight," John Oliver discussed the story of a man who used marijuana to treat his PTSD.[51] The little research done on the use of marijuana as a treatment for PTSD, however, has demonstrated that marijuana does not benefit PTSD patients; in fact, cannabis is associated with "worse PTSD symptoms, more violent behavior, and alcohol use. Marijuana may actually. . . nullify the benefits of specialized, intensive treatment."[52] The danger of the Schedule I classification of cannabis, therefore, is that research into not only the benefits but also the harm of marijuana is limited. Medical marijuana has been legalized in 28 states so far, but the treatments that these states offer have not, and largely cannot, receive validation through the most rigorous scientific processes.[53] The State of New York, with one of the most restrictive medical marijuana policies in the country, recently added PTSD to its list of conditions eligible for medical marijuana use.[54] The removal of marijuana from the Schedule I list, therefore, will not only benefit patients who could benefit from medical marijuana, but will also protect people from the harm associated with understudied or unknown side effects of cannabis. Further research should be done to prevent the increased use of marijuana to treat disorders that it worsens, not benefits, but such research will remain limited as long as marijuana is classified as a Schedule I drug.

Social Implications of Medical Marijuana

One of the most common misconceptions about marijuana is that recreational marijuana is a gateway drug. Under this hypothesis, although marijuana is a "soft drug," its use can lead to the use of "hard drugs" such as heroin and methamphetamine, two drugs that, under current law, are subject to milder restrictions than marijuana. The gateway hypothesis predicts that marijuana is the first base in a game of allegorical baseball: once players land on first base, they are much more likely to head to second, or even third; however, they are much more likely to stop at first base than they are to head straight for third.[55] Marijuana is the classical gateway drug in this theory, although alcohol and tobacco have also been assigned

this role at times.[55] The concept of the gateway drug recently reappeared in December 2017, when the *New York Times* came out with an article entitled, "A Comeback for the Gateway Drug Theory?"[56] The conclusion of the article, however, did not support the gateway hypothesis. Although there tends to be a sequence to recreational drug use, the article offered a competing hypothesis: common liability theory.[56] Common liability theory discusses the ways in which using drugs affects users, as well as their inherited or otherwise latent risk.[55] While the gateway hypothesis impedes research and hinders interventions, common liability theory encourages further research into the "mechanisms and biobehavioral characteristics that pertain to the entire course of development of the *disorder* [sic]."[55] Common liability theory reveals how both gateway theory and its D.A.R.E.-related solutions, such as the infamous "Just Say No" and "This Is Your Brain on Drugs" ad campaigns, have been problematically oversimplified.[57–59]

Although common liability theory has largely replaced the gateway drug hypothesis and all of its dire warnings for American youth, the reclassification of medical marijuana could prevent significant future harm to minority groups. The removal of marijuana from the list of Schedule I drugs cannot remedy the harm done to past generations of African-American and Latin-American citizens, immigrants, and refugees, nor can it prevent the incarceration of current casualties of the "War on Drugs." But the reclassification of medical marijuana can work to prevent future harm to these minority groups.

The history of New York City offers a prime example of racial bias in city policing, and marijuana was once a key tool in its racist arsenal. The New York City police department enacted "broken windows" policing in the 1980s, encouraging arrests for minor offenses to improve the quality of life in the city.[60] By 2000, smoking marijuana in public view had become the most common misdemeanor arrest, and most arrestees were either African-American or Hispanic.[60] In addition, data on stop and frisk policing from 2004 to 2008 in New York City reveal a racial bias centered on marijuana enforcement in African-American neighborhoods.[60] While "stop and frisk" ended in 2013 because of demonstrated racial profiling, African-American citizens are still unfairly targeted for marijuana use around the country.[61]

AG Sessions exemplifies the type of rhetoric that supports the race-based profiling. On May 1, 2017, he wrote a letter to members of Congress Mitch McConnell, Paul Ryan, Charles Schumer, and Nancy Pelosi requesting that the war on drugs not be derailed by recent legalization of recreational or even medical marijuana.[62] The letter states, "It would be unwise for Congress to restrict the discretion of the Department to fund particular prosecutions, particularly in the midst of an historic drug epidemic and potentially long-term uptick in violent crime. . . . Drug traffickers already cultivate and distribute marijuana inside the United States under the guise of state medical marijuana laws."[62] The "particular prosecutions" at stake, however, have demonstrated significant race-based profiling. To use one state as an example, in 2010 California imprisoned African Americans 13 times more frequently than other races for marijuana-related offenses; in 2011, that number dropped to only 10 times.[63]

The rescheduling of marijuana cannot stop racial profiling (from affecting) in incarceration rates, even in the instance of marijuana-related crimes. In Colorado and Washington, marijuana has been legalized for several years; however, the legalization of marijuana only applies to adults 21 years of age and older.[64,65] One preliminary study demonstrates that, while arrest rates for both those over the age of 21 and those under the age of 21 plummeted by more than 70 percent from 2008 to 2014, compared with 23 percent or less in states that did not legalize marijuana, the gap between African-American arrests and white arrests remained essentially the same.[64] African Americans are still 3.73 times more likely to be arrested for marijuana possession than whites in the United States, despite the rates of possession between the two groups being equal.[66] While marijuana policies cannot prevent racial bias in the American criminal justice system, this study demonstrates that the legislative status of marijuana could have a significant impact on the American prison population.

Conclusion

In conclusion, this article offers a new perspective on the medical marijuana debate by offering a new type of discussion of marijuana and other highly controversial drugs. A comparison of opioids, ketamine, and cannabis demonstrates that the United States has incorrectly categorized marijuana. The current opioid crisis shows that opioids should not be given as a treatment for chronic pain, and the introduction of medical marijuana into the treatment of chronic pain

has the potential to revolutionize care and stem the tide of the opioid epidemic. Patients who suffer from illnesses such as epilepsy and multiple sclerosis would also benefit from further research into beneficial use of medical marijuana. By examining both the risks and benefits of these three types of drugs, this article points out that medical marijuana has been unnecessarily forbidden and unreasonably stigmatized by the federal government, which has falsely claimed that cannabis is more dangerous than both opioids and ketamine, and that it lacks any medical use.

This article has touched only briefly on the sociopolitical history of marijuana and the relationship between the criminalization of marijuana and racial bias in America.[2,3,66] The reclassification of marijuana alone cannot prevent the overrepresentation of African-American men in America's prisons, nor can it ensure that broken-windows policing will never again be enacted in the United States. It might, however, limit the arrest of future teenagers, African-American or otherwise, who have been imprisoned for possession of illegal substances.

This article demonstrates that marijuana should be removed from the Schedule I listing, as would be consistent with the labeling of ketamine and opioids, and reclassified as a Schedule III or Schedule II drug. Given the beneficial medical use, possible side effects, and potential for abuse and addiction of each drug, medical cannabis has been unfairly kept from the public through its unnecessary classification as a Schedule I drug. The federal government should not ignore the potential socioeconomic benefits of decreased race-based arrest and imprisonment, or the opportunity to modernize American attitudes toward drug abuse, as well as the dangerous racial profiling that often accompanies such stereotypes.

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