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Cannabis and the *Gateway* *Drug Theory*: Correlation or Causation – Where does the Evidence Point?

Dalgarno Research Report (DRR)

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CANNABIS AND THE GATEWAY DRUG THEORY: CORRELATION OR CAUSATION – WHERE DOES THE EVIDENCE POINT?

The Cannabis is a ‘Gateway Drug’ proposition has oscillated between hypothesis, theory, and fact (all be it tenuous). The contentiousness of this issue is obviously influenced – if we are candid and strip away all peripherals – by market forces and ‘whoever’ is managing to control the narrative in the public discourse.

So, what is the ‘gateway theory’. The following definition encapsulates the essence of the [concept](#).

“ The “gateway drug theory” describes the phenomenon in which an introduction to drug-using behavior through the use of tobacco, alcohol, or marijuana is related to subsequent use of other illicit drugs. The theory suggests that, all other things being equal, an adolescent who uses any one drug is more likely to use another drug. In practice, early introduction to substance use for adolescents is often through tobacco and/or alcohol. These two drugs are considered the first “gate” for most adolescents. Under this hypothesis, tobacco, alcohol, and marijuana are all considered “gateway drugs,” preceding the use of one another and of illicit drugs.

Drug use, be it licit or illicit, and the developing brain is always a complex issue, with absolutely no doubt that any amount of drug use detrimentally impacts the developing brain, even if ever so minutely.



Brain development research has shown that from the age of nine to about 25 years old the brain undergoes two well-known processes. The first, known as pruning, is the process where the brain gets rid of synaptic connections it doesn't use. The second process, known as myelination, coats the axon of the neuron in a fatty substance called myelin that protects the neuron and helps the brain work more efficiently. **Anything that disrupts that process is bad for the brain!**"

(Daniel Amen, MD, a double board-certified psychiatrist and founder of Amen Clinics, studying brain imaging at his own centers since 1991.)¹

One of the reasons for categorizing cannabis more specifically as a *gateway drug*, has, to our mind, two 'bookends'

Firstly, the long standing strangle hold of [alcohol](#) on culture has meant it is often overlooked as a 'drug'. Where in fact it is (arguably) the first [manufactured drug in human history](#). This under-categorization of alcohol has meant it often escapes a more robust scrutiny about its contribution to the physical, mental and psychological decline of its users and the diminishing of those around them.

We now know that nicotine has significant detrimental impact on adolescent brain develop – ["it is brain poison for youth"](#) – impacting synapse formation. And if no other substance is involved, it too could be a [candidate as a gateway drug](#). This is the nature of this theory and the ever-growing understanding of substance use's adverse impact on the developing brain. Yet, even if nicotine does not fit squarely into the gateway category, in combination with other licit and illicit drugs, it helps 'open that gateway' quicker and further.

According to research published in 2012 and using the *Guttman Scale* analysis, found that alcohol served as a certain candidate for the 'gateway' theory too. The study, [Alcohol as a gateway drug: a study of US 12th graders](#)² led researchers to conclude that alcohol use in early adolescents led to tobacco and then cannabis and other illicit drug use. This was further affirmed by a 2015 published study looking at the need to identify prevention interventions for the younger adolescent cohort. Prioritizing Alcohol Prevention: [Establishing Alcohol as the Gateway Drug and Linking Age of First Drink With Illicit Drug Use](#)³

Of course, for anyone paying attention, this is precisely the procession that happens in the vast majority of young drug users, at least in the Australian context.

FOR THE LONGEST TIME, TOBACCO AND ALCOHOL WERE USED BY THE MASSES, WITH FEW (BY COMPARISON) 'JUMPED' INTO COCAINE, METHAMPHETAMINE, MDMA AND/OR HEROIN USE. YET, IF CANNABIS IS ENGAGED, THIS 'JUMP' APPEARS MORE LIKELY – MORE ON THIS LATER.

One of the ironies in all this, is that whilst Australian smoking rates are the lowest (arguably) in the world, with uptake of tobacco significantly reduced. In the Australian context it is only until alcohol is consumed that 'smoking' then becomes an option. This of course is usually in concert with social

contagions of group think, peer pressure and the enhanced enticement these produce. Anecdotal data sees the following migration path into illicit drug use.

First drug is Alcohol, then tobacco (to learn delivery technique), then cannabis, then MDMA.

The even greater irony, is that the virtual (and successful) 'war' being waged against tobacco in Australia, is being strategically undermined by the passive, if not permission posture toward cannabis use that has emerged over the last 5 years particularly. People who take up cannabis, are [more likely to then use more tobacco](#).



The other bookend this perspective is the notion that cannabis was the *most harmless* of the currently categorized illicit drugs in play and it was deemed, either by evidence or anecdotally, that those who engaged with cannabis, thus 'graduating' from the legal drugs of alcohol and tobacco, were far more likely to move onto other drugs that were deemed 'harder' again, cocaine, heroin, and/or amphetamine.

That caricature would have certainly been more apt some 25 to 50 years ago, when the early '[stoner](#)' culture used cannabis to be either more sophisticated, or [counter-cultural](#), as well as being seen to '*stick it to the 'man'*' (whoever that was). The engagement with this psychotropic toxin seemed to parallel with many then moving onto other substance use.

However, also adding weight to the gateway title is also the demographic that engage with cannabis – the 12 to 20 year old cohort. As mentioned earlier, drugs do mess with the developing brain but cannabis does something that nicotine and alcohol don't appear to do, and that is [accelerate 'cortical thinning' and change the shape of the brain](#) to a detrimental end.

The more times the cannabis-using teens reported they had used cannabis, the faster it turned out their cortices had "pruned" themselves.



The areas that had thinned, the researchers found, were also the areas most prone to change in adolescence — what Albaugh describes as the more “plastic” parts. Students at five years also took an assessment of impulsiveness: These responses suggest cannabis-related thinning was also associated with increased impulsiveness.⁴

Impulse control in the developing adolescent brain is geared to a number of factors, most importantly environmental. The greater the impulse control developed in the pre-pubescent

individual, the greater connectedness to protective environments and relationships, and the greater the internal resiliency – what we call the ‘brain brakes’ – then the better the impulse control when the adolescent brain starts its ‘accelerator’ phase. This is the time the personhood of the emerging adult is endeavouring to define itself and learn by self-determining implementation, not merely by ‘direction’.

We were designed for **Reward and Exploration**, but can easily be left to **Rebellion and Experimentation**.

It is the later set that sees much less impulse control. However, if you now add cannabis to this process, then it is not just GABBA neurotransmitters being interfered with, but an actual change in brain structure – This could be just one element that opens the gate to stronger drug seeking activity?

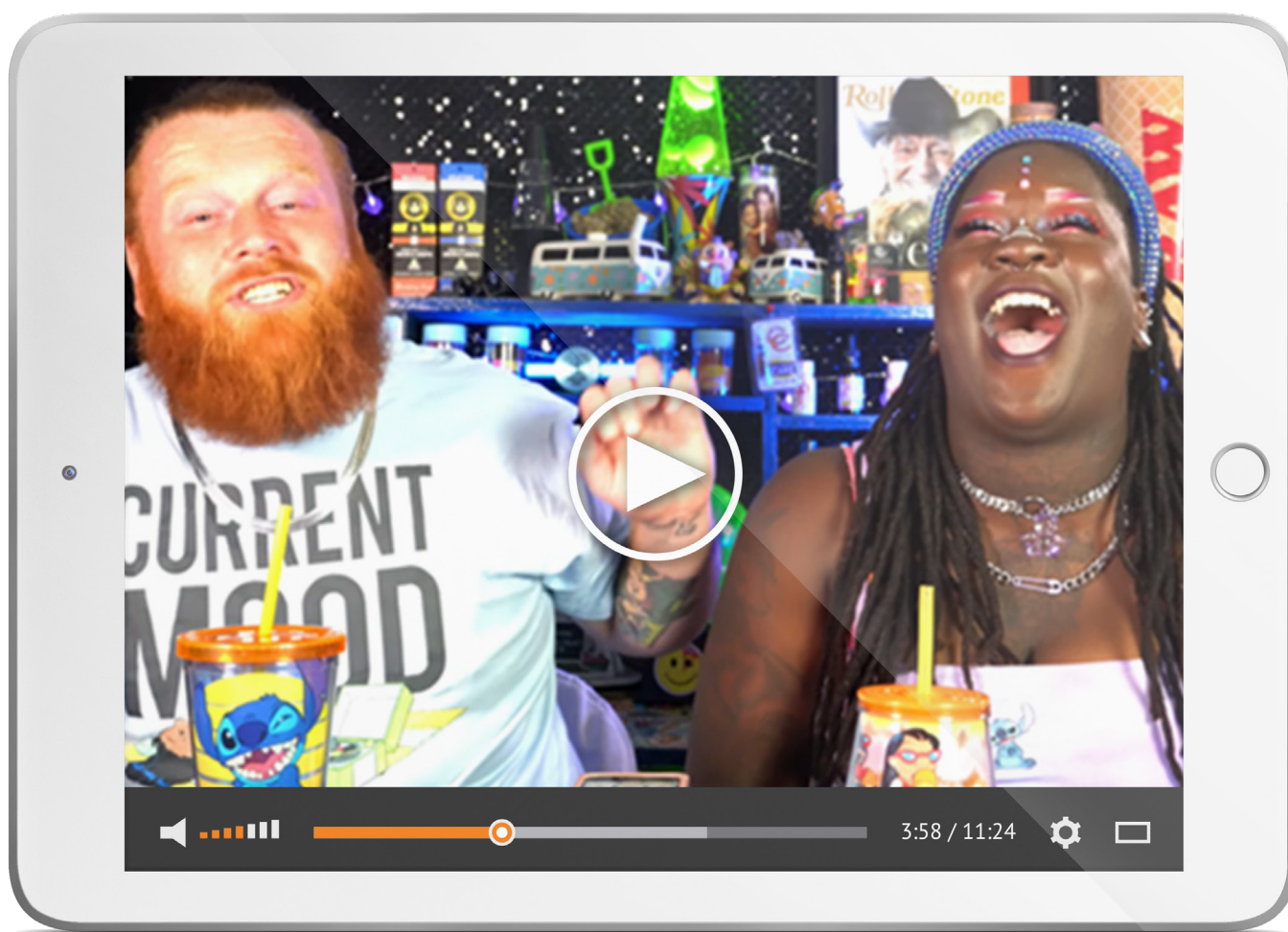
THE ‘GRADUATION’ OF GANJA?



What of the *Marijuana*, the cannabis of today, is it still the ‘soft drug’ in the arena of illicit substances, or has it now graduated into the hard drug category?

Has the new potency of this now completely unnatural product, thrust it into parallels with the other classically deemed hard drugs? Depends on who or what you choose to listen to.

<https://www.youtube.com/watch?v=DzWz3Eno7og&t=2s>



<https://www.youtube.com/watch?v=ELr2iQhvHaA&t=8s>

The scientific evidence around the impact of cannabis on both body and brain is not only mounting it is damning, with psychotic breaks and behaviours mimicking that of Crystal Meth users, and [Cannabis leading the race in the development of long-term psychotic disorders](#). As this study reveals that the conversion rate of drug induced psychotic episode to a psychotic disorder was at 47% of candidates who use Cannabis, which is almost double of those that experienced this 'graduation' from using hallucinogens.

Is it any wonder when such as the one in the image below, not only affirming the potential of extreme experiences, but treating such engagements as, at best, worthwhile and interim, and at worst a [laugh for those watching](#) the user's descent into psychosis. Even a Colorado sourced article, sheepishly alludes to the 'softer' edge of this chaos; [High-THC Cannabis Concentrates and Their \(Scary\) Effect on the Teenage Brain](#).

Further weight to this gateway theory bookend comes from an unlikely source. According to 2016 American Heart Association Meeting Report, cannabis use is causing heart issues which are exacerbated by the mental health impact of this drug use.

“ However, despite being younger and with fewer cardiovascular risk factors than non-users, during stress cardiomyopathy the marijuana users were significantly more likely to go into cardiac arrest (2.4 percent vs. 0.8 percent) and to require an implanted defibrillator to detect and correct dangerously abnormal heart rhythms (2.4 percent vs. 0.6 percent).

“This development of stress cardiomyopathy in younger patients who used marijuana suggests a possible link that needs to be further investigated,” said Sahil Agrawal, M.D., co-author of the paper and also a chief cardiology fellow at St. Luke’s.

Marijuana users were more likely than non-users to have a history of depression (32.9 percent vs. 14.5 percent), psychosis (11.9 percent vs. 3.8 percent), anxiety disorder (28.4 percent vs. 16.2 percent), alcoholism (13.3 percent vs. 2.8 percent), tobacco use (73.3 percent vs. 28.6 percent) and multiple substance abuse (11.4 percent vs. 0.3 percent). Because some of these can increase the risk of stress cardiomyopathy, the researchers adjusted for known risk factors to investigate the association between marijuana use and stress cardiomyopathy.⁵

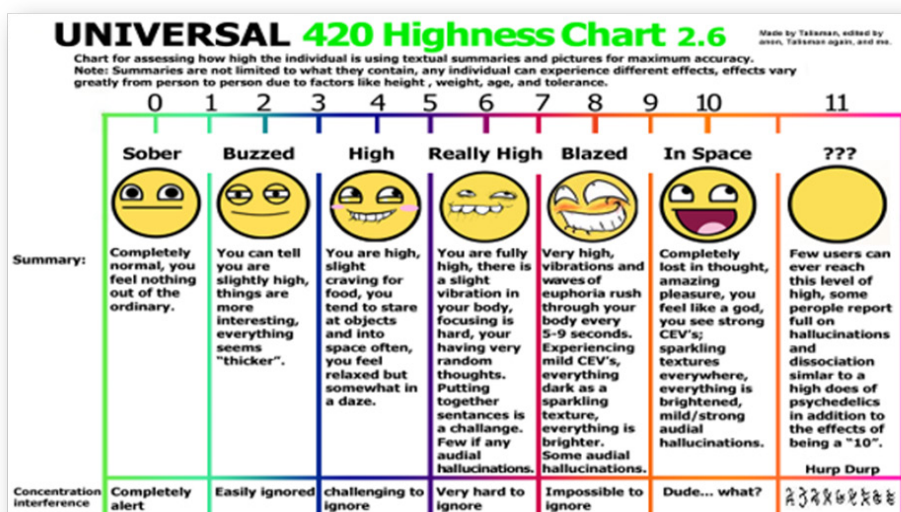
American Heart Association Meeting Report - Poster: S4054 - Session: HF.APS.P14
American Heart Association

In a article posted on the Canadian Medical Association Journal September 2021 further research revealed cannabis impact on heart health, from the conclusion...

“ Our study provides evidence supporting an association between recent cannabis use and history of MI in young adults. Increasing cannabis use in an at-risk population could have negative implications for cardiovascular health. ⁶

As indicated, these poor heart-health outcomes are contributing to psycho-emotional duress which can lend the cannabis user to migrating to further self-medicating vehicle for alleviation of this duress, thus ‘pushing the gate’ further open to the ‘harder drug’ genre.

Further to this and as this popular if not ‘unscientifically’ adopted promotional tool further affirms the supposed ‘up’ side of these distressing episodes. The purported buzz soon gives way to distressing mental illness that only further strains the body. This too could be a trigger to try different substances to abate, negate, manage or replace cannabis use.



PERSPECTIVES: CANNABIS IS NOT A GATEWAY DRUG.

We will look at some of the reflections and opinions of the anti-gateway theory model, and for this piece, we will even include those more agnostic about the theory in the ‘no’ camp.

In a blog post on psychology today, Adi Jaffe, Ph.D is one such clinician. The article, [Is Marijuana a Gateway Drug?](#)⁷ Dr Jaffe tries to land on a hard ‘no’, but with no success.

“ On the one hand, research does support the positive effects of cannabis in treating [chronic pain](#) conditions (while not as strong a relief in the short term for many, the probability of developing hypersensitivity to pain seems to be reduced with THC when compared to opioids [[debunked](#)]).

On the other hand, the research on the potentially harmful physical and psychological effects of cannabis use is hard to ignore. Marijuana is damaging to the developing adolescent brain, and it can lead to Cannabis Use Disorder (or [addiction](#)).

However, the causal link between cannabis and “harder” illicit drug use is still unclear and relies on many other factors such as life experiences, parental supervision, and the social environment and laws. The gateway theory of marijuana fails to explore the legal implications of purchasing and using marijuana in states where it is still a criminal offense and how this can be the precursor for choosing to use harder, illicit substances.

All in all, the Gateway Drug Theory of Marijuana has several weak spots and in light of its decriminalization in most states of the United States, it may be even completely irrelevant.

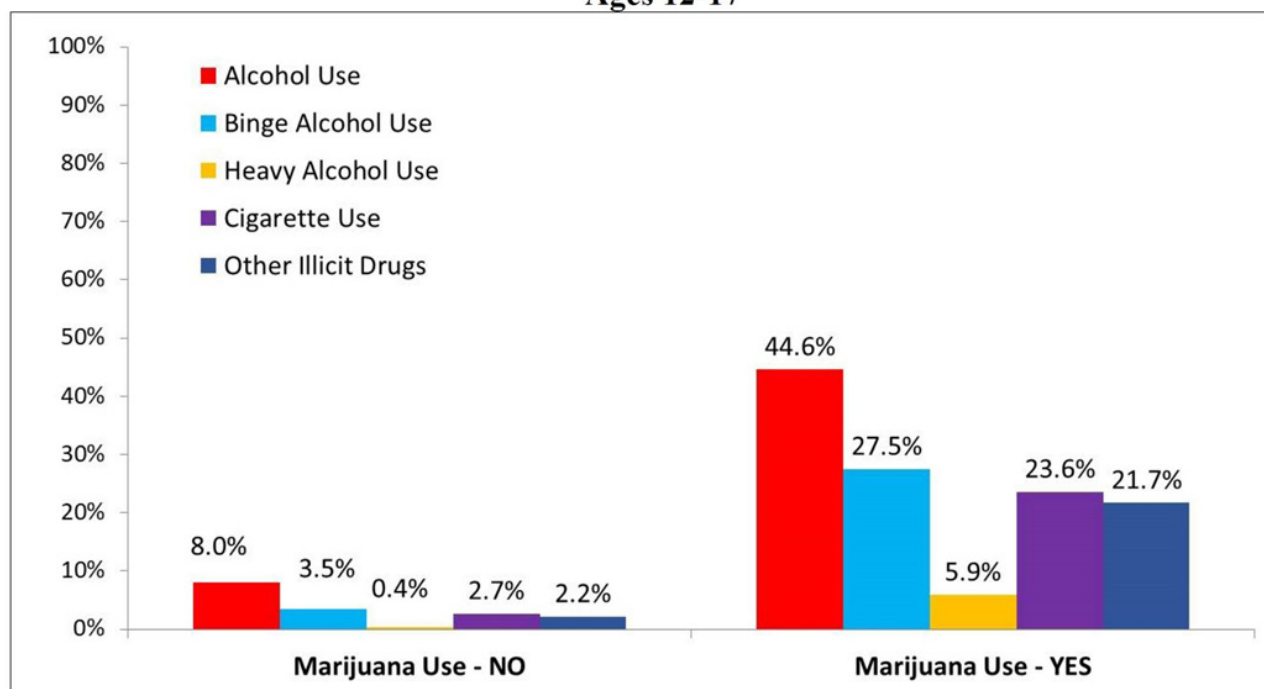
In this current social and political climate, further research is needed to examine cannabis use as a gateway to further drug use. There is little doubt that, with the rapid increase in opiate-related deaths, we want to make sure not to make a problem worse, if possible. And as with any emerging drug research we need to think more critically about the findings put forward.

The **Drug Policy Alliance**, who have an unabashedly less preventative view on illicit drug use, were at pains to challenge the gateway drug narrative, and started by going after one of the foundational premises behind the ‘theory’.

They challenged the purported initiator of them, retired U.S Drug Czar Psychiatrist, Dr Bob DuPont. The term “gateway drug” was popularized in 1984, during [Reagan’s renewed war on drugs](#), by Dr. Robert L. DuPont, Jr. in [Getting Tough on Gateway Drugs: A Guide for the Family](#). DuPont posited that if young people do not use marijuana it is relatively unlikely that they will use other illegal drugs, but he did not make the claim that marijuana use causes young people to use

other drugs. The article went on to discredit the initial assumptions of DuPont by challenging their claim that he confused correlation with causation even though later research from Dupont, Han, Shea and Madras in 2017, demonstrated a more conclusive causal than correlate link (see following graph)

Figure 1. Past Month Use of Other Drugs, if Marijuana is Used, Ages 12-17



Data from DuPont, Han, Shea, Madras. Preventive Medicine 113: 68-73, 2018. [Graph prepared by BK Madras, C Shea]
 Past month use of alcohol, tobacco and illicit drugs, among youth aged 12-17, by marijuana status (past month adjusted prevalence; n = 17,000; data from Table 1). Y-axis: past month prevalence in %)

Now, of course, good research needs to ensure such easy mistakes are ‘weeded out’ of the analytical process, but what surprised us, was this off handed dismissal, without further review of the future emerging evidence the DPA are privy too, sounded incredibly reminiscent of the Tobacco industries decade held mantras of the same tenor – you can’t prove causation in correlation! This is not unsurprising as we see the current Cannabis Industry running the identical [propaganda playbook that Big Tobacco](#) did for years. What is surprising, is that people are falling for it again – but as Journalist Malcolm Muggeridge so famously opined, ‘People don’t believe a lies because they have to, they believe them because they want to.’ Such is the substance addled logic of pro-drug activism.

The following 2018 published literature review ‘landed’ on a tentative and qualified ‘no’ to cannabis being a gateway drug, but noted both the lack of quality evidence on the subject and some conflicting data.



IS CANNABIS A GATEWAY DRUG? KEY FINDINGS AND LITERATURE REVIEW *(published November 2018)*

This report presents the findings and methodology of a literature review of research relevant to an evaluation of the validity of the “gateway” hypothesis that using cannabis causes the user to progress to the use of harder illicit drugs such as cocaine or heroin.

Abstract

This literature review analyzed 23 peer-reviewed research studies, both human-based and animal-based, that focused on cannabis use and its link with the subsequent use of other illicit drugs. Overall, the literature review concludes that existing statistical research and analysis relevant to the “gateway” hypothesis has produced mixed results, thus failing to provide clear scientific support for cannabis use as an inevitable “gateway” to harder illicit drug use. This necessitates the main conclusion that “no causal link between cannabis use and the use of other illicit drugs can be claimed at this time.”

This report notes that the current state of research on this issue is limited, and the studies that have been conducted suffer from difficulties in collecting information and applying the findings to a larger population.

The report further notes that although many of the reviewed studies found statistically significant associations between cannabis use and the users’ later use of other illicit drugs, there is currently no conclusive evidence that cannabis use caused the later use of harder illicit drugs.

Recommendations for future research advise that an analysis of cannabis and its association with other illegal substances should be conducted with a design that randomly assigns selected human participants to control groups and experimental groups, and that potential participants be screened for confounding variables, such as genetic predispositions to addiction.⁸

In the same year, an article published in the *Psychology Today*, we also see a more reflective critique of the literature, that doesn’t deny the theory, but too, lands more in the tentative ‘no’ camp. The following excerpt sees much of the same conclusions as the previous analysis.



IS MARIJUANA A GATEWAY DRUG?

For quite some time, marijuana was seen as the start of trouble, but why? (Posted July 24, 2018)

This large study, published in a respected [psychiatric](#) journal, was used in some [recent articles](#) to remind us of the gateway theory of marijuana use, which I think deserves some more thought..

In the earlier mentioned article, marijuana users were 5 to 9 times as likely to experience and opioid problem 3 years later if they used marijuana occasionally, frequently, or very frequently respectively. Mind you, the absolute probability for opioid problems was low even for very frequent marijuana users (around 4.5 percent) but compared to the 0.5 percent probability in those who didn't use marijuana at all, it was a relatively large jump (see [here](#) for a deeper dive into why this is important). So, depending on how you look at it, the increase was incredibly large or pretty small. And even among the heaviest marijuana users, approximately 95 percent did not seem to have opioid-related issues.

But when it comes to the gateway aspect of the argument, there was more to be examined. That's because substance use can depend on contextual factors such as:

- *Neighborhood and community environment*
- *Level of parental supervision*
- *Unique characteristics of the individual including their biology and life experience*

When it comes to marijuana use in particular, there are some unique aspects to be considered as well:

- *Initial experience with cannabis (whether it is rated as enjoyable)*
- *Perception of marijuana as a “safe” or “harmful” drug*
- *What these studies seem to have in common is the inability to draw a strong causal conclusion about risk factors and later drug use.*

What are the shortcomings of the Gateway Drug Theory?

This means that, once you buy marijuana you are already breaking the law, and we know that individuals who become willing to commit illegal acts at one point in time are more likely to commit additional illegal acts. In this way, it could be said that its marijuana's legal status, not its chemical interactions with the brain at all, that is the gateway. Not only that, but once the law is broken and you've bought weed from a drug dealer, you can now interact with people who will have access to other illicit drugs. That makes it more likely that you will break the law again and that you will go on to try other substances, because they are now available.

However, the causal link between cannabis and “harder” illicit drug use is still unclear and relies on many other factors such as life experiences, parental supervision, and the



social environment and laws. The gateway theory of marijuana fails to explore the legal implications of purchasing and using marijuana in states where it is still a criminal offense and how this can be the precursor for choosing to use harder, illicit substances.

All in all, the Gateway Drug Theory of Marijuana has several weak spots and in light of its decriminalization in most states of the United States, it may be even completely irrelevant.

In this current social and political climate, further research is needed to examine cannabis use as a gateway to further drug use. There is little doubt that, with the rapid increase in opiate-related deaths, we want to make sure not to make a problem worse, if possible. And as with any emerging drug research we need to think more critically about the findings put forward.⁹

PERSPECTIVES: YES – CANNABIS IS A GATEWAY DRUG!

As we are gleaning, the lack of robust clinical data that can help us land firmly on affirming or denying this ‘theory’ as more fact or mere hypothesis is an impediment. However, we now need to look into the data that leans more to confirming the theory that cannabis may well be a gateway drug.

In 2021 [Elizabeth Hartney, BSc., MSc., MA, PhD](#) penned an article adding her perspective to the debate, the following is an excerpt from that paper. Whilst ostensibly landing in the agnostic space, of the theory being ‘unprovable’, Elizabeth does lend weight to the theories viability.



IS WEED REALLY A GATEWAY DRUG?

Most people who develop severe problems with drugs, such as cocaine, meth, and heroin, had early experiences with marijuana before trying these other drugs.²

However, it’s important to note that at the same time, most people who use marijuana will not go on to use these harder substances.³

Nevertheless, the argument is that if these hard drug users had not taken marijuana in the first place, they would not have been lured into a false sense of security around drug use, and so would never have progressed to other, more harmful substances.

By their exposure to illicit drug use in the form of marijuana, young people may be introduced to the world of drug use and to drug dealers who have other, harder drugs to offer, such as LSD, cocaine, and heroin.

Ironically, the gateway drug theory of cannabis has been used to support both sides of

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the *debate on whether marijuana should be legalized*. The anti-legalization lobby argues that marijuana's status as a gateway drug makes it more dangerous to users in the longer term, by introducing them to the experience of scoring, possessing, and consuming an illegal drug.

Meanwhile, the pro-legalization lobby argues that it is the illegal status of the drug, combined with its relative harmlessness, which makes it uniquely positioned as a gateway to other illegal drug use. They argue that if marijuana were legal, it would no longer be a gateway drug, as users could purchase the drug through legal channels and thus not be exposed to harder drugs.

The relevance of the gateway drug theory rests on the premise that marijuana is harmless, which is incorrect.⁵ But this does not provide much support for the argument that marijuana is not a gateway drug.

To make that argument, it would have to be admitted that marijuana is potentially harmful in its own right, and the anti-legalization movement could then simply shift their emphasis to the direct harms caused by marijuana.

As this does not support the goals of the pro-legalization side, proponents tend to stick to the view that marijuana is, for all intents and purposes, harmless, and the harms it causes arise from its illegal status.



Extensive research into the relationship between cannabis use and other drug use has only partially answered this question. Studies indicate that some people have a partially genetic predisposition to drug use and that they are more likely to become heavy cannabis users.⁶ However, this finding doesn't particularly support the view that exposure to cannabis leads to other drug use.

The social aspects of the gateway drug theory are supported by evidence that cannabis users socialize with drug-using peers in settings that provide more opportunities to use other illicit drugs at an earlier age, and that this forms an illicit drug subculture with positive attitudes toward the use of other illicit drugs.⁷

The actual prevalence of drug use is



impossible to measure, and studies of drug use are fraught with inaccuracies, so there is no way of knowing whether marijuana and use of other drugs are consistently related. Certainly, there are many people who use marijuana and do not progress to other drug use, as well as many who do.²

Even if it was proven that users of marijuana were significantly more likely to use other drugs, there is no way of knowing whether it was because of the gateway role of marijuana, whether there were other factors at play, or because the individuals involved simply used whichever drugs were available to them.

Don't automatically assume that someone you know will progress to other drug use after using marijuana. But don't ignore the possibility, or assume that marijuana use won't lead to problems. It is important that parents take steps to prevent addiction in their kids, especially by setting appropriate boundaries, such as no smoking in the home. Additionally, parents should be willing to support a child in seeking help if needed.¹⁰

In 2009, Drug Free Australia penned one of the earlier looks into the cannabis gateway theory and from their research paper ***Cannabis – suicide, schizophrenia and other ill-effects: A research paper on the consequences of acute and chronic cannabis use***, the following was gleaned.



The term “gateway drug” is used to illustrate the tendency of cannabis to introduce the user to other illicit drugs, and arguments for and against the hypothesis have a long history.

There are multiple studies that have reached a conclusion in support of the gateway hypothesis (see Kandel, 1992 and 1996; Clayton, 1992; Bailey, 1992; Poikolainen et al, 2001). Specifically, the Centre on Addiction and Substance Abuse (CASA) at Columbia University found that children who use drugs, including cannabis, are up to 266 times more likely to use cocaine than those who do not use any of the gateway drugs identified (cannabis, tobacco and alcohol)

There are critics of the gateway theory who argue that a clear link between cannabis use and other illicit drugs does not reflect a causal sequence, relying upon the presence of confounding factors such as a user's socio-economic status and family history (see Johnson, 1973; Hays et al, 1987).

In contrast, the US Office of National Drug Control Policy's “2008 Marijuana Sourcebook” clearly states that recent research supports the gateway hypothesis, specifically that “its use creates greater risk of abuse or dependency on other drugs, such as heroin and cocaine”.

Further, a study on 311 sets of same-sex twins, in which only one twin smoked cannabis before age 17, found that early cannabis smokers were up to five times more likely than their twin to move on to harder drugs (Lynskey, 2003). Also, Hurd (2006) concluded that findings supported the gateway hypothesis when she conducted a study on rats.



Hurd found that rats trained to self-administer heroin would administer greater doses if they had previously been exposed to THC. A further study of 75,000 adolescents and young adults found teenage cannabis smokers had a 50% higher risk of developing an alcohol-use disorder and specifically stated “Addictive drugs all act on a part of the brain that is described as the central reward circuitry. Once this system is exposed to one drug, the brain may become more sensitive to the effects of other drugs, as demonstrated by a number of rodent studies” (Gruzca, 2006).

(Behrendt 2009) results revealed several interesting findings. First and foremost, early onset users were shown to have an elevated risk of substance use disorder, even if the transition to substance use disorders was not immediate. The transition from first cannabis use to cannabis dependence occurred more rapidly than transitions to alcohol disorders and nicotine dependence. Substance use onset later in adolescence was associated with a more rapid progression to substance use disorders for alcohol and nicotine. Overall early onset of substance use was not shown to lead to a rapid progression of substance use disorders. But delaying first substance use is still important.

In summary, as Kandel states (1992), very few try illicit drugs other than cannabis without prior use of cannabis.”

An article published in **Tech Times** in 2016, dissected the research on drug use migration as being published by researchers, including publishing in JAMA. The article **Smoking Marijuana Gateway to Alcohol Addiction, Abuse Of Other Drugs** reiterates some of our previously mentioned issues around the chicken and egg of alcohol, tobacco and cannabis use.



Two new studies showed a link between marijuana use, alcohol use disorder and abuse of other drugs. Researchers said policymakers in states where cannabis is legal should consider these risks.

For the first study, which was published in the journal *Drug and Alcohol Dependence*, the results showed that adults who smoke marijuana have five times increased odds of developing alcohol use disorder (AUD) compared with their counterparts who do not smoke.

By looking at the data of more than 27,000 adults, researchers found that the participants who did not have AUD but reported using [cannabis](#) during the first survey were 5.4 times more likely to have an AUD three years later.

“Among adults with no history of AUD, cannabis use at Wave 1 was associated with increased incidence of an AUD three years later relative to no cannabis use,” study researcher Renee Goodwin, from Columbia University, and colleagues [wrote](#). “Among adults with a history of AUD, cannabis use at Wave 1 was associated with increased likelihood of AUD persistence three years later relative to no cannabis use.”

The second study, which was published in *JAMA Psychiatry* and involved more than

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34,000 subjects, revealed that participants who used cannabis during the first survey were about six times as likely to suffer from substance use disorder after three years.

Researchers also found an increased risk for drug use disorders and nicotine dependence among pot smokers.

“Our study indicates that cannabis use is associated with increased prevalence and incidence of substance use disorders,” Carlos Blanco, from the National Institute on Drug Abuse, and colleagues [wrote](#). “These adverse psychiatric outcomes should be taken under careful consideration in clinical care and policy planning.”¹²

The US based National Institute on Drug Abuse weighed in on the Gateway Theory, just last year. With the mounting evidence of harms with the ‘new marijuana’ evidence lending itself to the theory being fact found an ally in their research.

“

Early exposure to cannabinoids in adolescent rodents decreases the reactivity of brain dopamine reward centers later in adulthood.⁴⁷ To the extent that these findings generalize to humans, this could help explain the increased vulnerability for addiction to other substances of misuse later in life that most epidemiological studies have reported for people who begin marijuana use early in life.⁴⁸ It is also consistent with animal experiments showing THC’s ability to “prime” the brain for enhanced responses to other drugs.⁴⁹ For example, rats previously administered THC show heightened behavioral response not only when further exposed to THC but also when exposed to other drugs such as morphine—a phenomenon called cross-sensitization.⁵⁰

These findings are consistent with the idea of marijuana as a “gateway drug.” However, the majority of people who use marijuana do not go on to use other, “harder” substances. Also, cross-sensitization is not unique to marijuana. Alcohol and nicotine also prime the brain for a heightened response to other drugs⁵¹ and are, like marijuana, also typically used before a person progresses to other, more harmful substance.¹³

Research continues to affirm the cannabis, alcohol and tobacco factor and/or contribution to the *Gateway Theory*. As we’ve touched on earlier in this piece, they all have various capacities to influence this ‘gate’ to more and harder substance use, with cannabis bringing a unique contribution to this issue.

Journal of Studies on Alcohol and Drugs in their volume 77, issue one also published research on this biochemical ‘dance’ and its contribution to sustained cannabis use. The paper titled, *The Relationships of Cigarette and Alcohol Use With the Initiation, Re-initiation, and Persistence of Cannabis Use* had the following objective... “a prospective survey to examine (a) the relationships of early onset and prior consumption of cannabis, cigarette, and alcohol use with later cannabis use initiation, re-initiation, and persistence; and (b) whether the quantity or frequency of alcohol or cigarette use was more predictive of cannabis use initiation, re-initiation, or persistence.”

The conclusion of from this National Epidemiologic Survey was the following,



Early onset and prior experience with cannabis, cigarettes, and alcohol could have effects on later cannabis use, varying among the three at-risk populations. Different strategies are needed for preventing cannabis use initiation, re-initiation, and persistence, based on targeting early use of alcohol and cigarettes.¹⁴

Again, we see that cannabis has another and unique layer of influence in this process, and worth keeping in mind when attempting to understand the *Gateway Theory* and its implication on prevention and intervention policy.

A French study conducted and reported on in 2011 sought to confirm or otherwise the notion of cannabis as a 'gateway drug' or to use the researcher's terminology, '*cannabis use patterns on the probability of initiation with other illicit drugs*' or (OID). The following is an excerpt from this specific cohort study.



A French nationwide retrospective cohort on drug use was reconstituted on 29,393 teenagers. A Markov multi-state model was fitted, modelling all possible pathways from initial abstinence to cannabis initiation, daily cannabis use and OID initiation. The model was adjusted for tobacco and alcohol use. The risk for OID initiation appeared 21 times higher among cannabis experimenters and 124 times higher among daily cannabis users than among non-users. Tobacco and alcohol use were associated with a greater risk of moving on to cannabis initiation (hazard ratio (HR) = 1.2 for tobacco initiation, HR = 2.6 for daily tobacco use and HR = 2.8 for drunkenness initiation).

*The results of this study provide a confirmation of a stage process in drug use, mediated by cannabis and liable to lead to OID experiment. **This is compatible with the literature on the gateway theory, but goes further by modelling the entire sequence of use. OID experiment could be a consequence of initial opportunity to use the more accessible illicit drug, cannabis.*** [emphasis added]¹⁵

Researchers who published in 2016 on illicit drug use as the 'gateway hypothesis' were, to quote, 'surprised' by some of the findings. The paper, "*Gateway hypothesis" and early drug use: Additional findings from tracking a population-based sample of adolescents to adulthood*, didn't simply look at cannabis/marijuana in isolation as a 'gateway' drug, but at both licit and illicit psychotropic toxins as 'door openers' to further and heavier drug use.

Of course, the younger the onset of drug use and its inevitable (yet variable) harms to the developing brain, the greater the trigger for levels of intensity in drug seeking behaviour – including alcohol **and nicotine**, as previously mentioned. Whilst alcohol and nicotine are serious contenders for the 'gateway' category, the 'graduation' (if you like) to illicit drug use is purportedly influenced more by cannabis than other drugs.

The following is taken from the paper's Discussion.



Our finding that early exposure to cigarette smoking and alcohol use was positively associated with later (almost 10.4 months) use of illegal psychoactive substances among older adolescence is consistent with numerous studies on the gateway hypothesis (Kandel, 2002, Agrawal et al., 2009, Mayet et al., 2012). However, our findings showed that over a relatively longer period of time (from adolescence to adulthood), early use of marijuana and other illegal drugs rather than tobacco or alcohol greatly increases the likelihood of using cocaine and other illegal drugs. A co-twin study in Australia found early cannabis use as a consistent predictor for other psychoactive substance use and in development of drug dependence (Lynskey et al., 2003).

Our data reveal that early use of psychoactive substances is associated with increased likelihood of using further illicit substances during adolescent period, but effects of these substances on later illicit drug use are inconsistent. However, early use of marijuana also appears to more readily 'open the gate' towards later use of other illicit substances. These findings are remarkable in view of the current debates on legalizing marijuana for recreational and medical uses, and the fact that our sample is population-based. Clearly, marijuana use in early adolescence enhances increased likelihood of continuing use of other psychoactive substances and may be further compromised by underlying mental health condition. Existing drug policy and intervention programs have placed more emphases on tobacco, alcohol as 'gateway' drugs to later illicit drugs, but our findings suggest that attention should equally be placed on marijuana and other psychoactive substances in some population groups particularly in the age groups ≤ 15 .¹⁶

A unique study, **Probability and predictors of the cannabis gateway effect: A national study**, was published International Journal of Drug Policy, in February of 2015. This work undertook to investigate not simply the association of cannabis use with other illicit drugs – often touted as *correlation* but focused on predictive factors and probability – more relating to causation. An excerpt from the work follows:



Results—Lifetime cumulative probability estimates indicated that 44.7% of individuals with lifetime cannabis use progressed to other illicit drug use at some time in their lives. Several sociodemographic characteristics, internalizing and externalizing psychiatric disorders and indicators of substance use severity predicted progression from cannabis use to other illicit drugs use.

Conclusion—A large proportion of individuals who use cannabis go on to use other illegal drugs. The increased risk of progression from cannabis use to other illicit drugs use among individuals with mental disorders underscores the importance of considering the benefits and adverse effects of changes in cannabis regulations and of developing prevention and treatment strategies directed at curtailing cannabis use in these populations.¹⁷

SO, WHERE TO FROM HERE?

On reading this paper I can imagine the various positions on this *Gateway Theory/ Hypothesis* could all be supported when our confirmation bias ‘kicks in’. The back and forth on various factors and influences, and certainly not least the nicotine and alcohol issue, all can ‘muddy’ the waters when attempting to land on a definitive conclusion.*

This writer was seeking to not simply ‘prove’ the theory, but more, hoped to uncover evidence that would push this theory into the arena of fact. Whilst that has not been the definitive outcome, from what we have journeyed through here, it certainly, from our understanding of the research, has not disproved the theory either.

In the end, the question becomes more about what are we really trying to achieve by either debunking or affirming this theory?

The pro-cannabis demographic look to every evidence to frame the new ‘Weed’ as relatively harmless as the non-engineered naturally growing 2.5% THC plant that still had its naturally occurring proportion of CBD and CBN of decades past. However, that is no longer possible, unless, of course, you simply lie. At the very best, unethical Harm Minimisation spin is all that is left for this cohort.

The anti-pot proponents, naturally seek to embrace and promote all evidence that makes this product look as ‘bad’ as possible. Yet, if we get past any ideologies (drug induced or not) and look purely at the evidence of harms, regardless of how little or large, and weigh it against the public, community, physical and psycho-social health of our communities, then we have an appropriate lens through which to view this drug.

The two substances that still incur the greatest harms to our society are the legal drugs of tobacco and alcohol – precisely because they are given that ultimate of social passes – legality, and the ‘rights’ enshrined in that status. These two products alone do immense damage to our societies on several levels; and what are we willing to trade all those harms for? ‘Fun’? ‘Pleasure’? ‘Self-medication’?

When distilled down to its essence, we realize that an incredible price is



being paid for a temporary buzz that continues to require re-engagement – and all for an ever-diminishing return on social, psychological, physical, and mental health.

So, if best-practice public health, public safety, productivity, community and family well-being matter most, the final question we must ask and answer is, why do we want to validate, affirm, or worse, add another psychotropic toxin to the currents of trade? Also, why defend and promote a substance that sabotages all the above key vital community well-being priorities?

Whilst the *Gateway Theory*, may give us further pause in our public health policy making, it should not be the key driver of such policy formulation. The drug, in and of itself, has way too many other community diminishing issues that warrant it being kept out of the permission, let alone promotion space.

But be rest assured, cannabis use will not lessen drug use engagement and the mounting harms these practices bring, so any action that creates, enables or expands a 'gateway' to self and community harm inducing drug use should be called out for what it is, in both policy and practice.

Yours for safer, healthier and stronger communities.

Shane Varcoe – Executive Director, Dalgarno Institute.

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