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THE GATEWAY EFFECT OF MARIJUANA

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May 2018

WHAT IS THE GATEWAY EFFECT?

The term “gateway effect” refers to the possibility that users of one drug, such as marijuana or alcohol, will subsequently use another drug, such as amphetamines, LSD, or opioids.

WHY MIGHT A GATEWAY EFFECT EXIST?

Two primary mechanisms are postulated as to why there might be a gateway effect. First, that use of one drug renders the user more susceptible to trying another drug due to changes in brain chemistry. Second, that users of one drug become part of a peer group

whose members also use other drugs, which makes use of those other drugs more socially acceptable and reduces barriers to access to those other drugs.

EVIDENCE FOR A GATEWAY EFFECT FOR MARIJUANA

Longitudinal studies undertaken in the 1970s found that early users of alcohol and tobacco are more likely subsequently to consume marijuana, and that early users of marijuana are more likely subsequently to consume other drugs.¹ More recent studies of twins indicate that youths who consume marijuana are two to four times more likely subsequently to use other drugs.²

However, just because a person who consumes marijuana is more likely subsequently to consume other drugs does not mean the consumption of marijuana caused that person to consume the other drug. It is noteworthy that in the same twin studies, early tobacco and alcohol use were more strongly correlated with subsequent illicit drug use in general than early marijuana use.³ This suggests that there were likely other factors that led both to the initial consumption of marijuana (and tobacco and alcohol) and to the subsequent use of other drugs.

A comprehensive survey by the Institute of Medicine in 1999 observed that "Patterns in progression of drug use from adolescence to adulthood are strikingly regular. Because it is the most widely used illicit drug, marijuana is predictably the first illicit drug most people encounter. Not surprisingly, most users of other illicit drugs have used marijuana first. In fact, most drug users begin with alcohol and nicotine before marijuana, usually before they are of legal age."⁴ The survey authors concluded that "There is no conclusive evidence that the drug effects of marijuana are causally linked to the subsequent abuse of other illicit drugs."⁵

It is possible that chronic marijuana use might have a long-term effect on the chemistry (and possibly the structure) of users' brains, such that they become more likely to consume other drugs. Studies on rats suggest that chronic consumption of the psychoactive component of marijuana, THC (delta-9 tetrahydrocannabinol), can affect brain chemistry in a way that may predispose some rats to be more likely to become addicted to opioids.⁶ However, the effects varied considerably depending on the strain and sex of rat. Given such wide variation even among rats and given the substantial differences between the brains of rats and humans, it is not clear whether similar effects occur in humans.

Studies that investigated actual causal linkages between human consumption of marijuana and subsequent use of other drugs found little evidence of such a link, suggesting that while chronic marijuana use may affect brain chemistry, it is not an important factor in determining subsequent use of other drugs.⁷ Other factors, such as poor education,

unemployment, unfavorable economic circumstances, being unmarried, and not being a parent, as well as traumatic events (emotional and/or physical abuse) appear to be the main reasons people consume opioids and other “hard” drugs.⁸ Genetic factors also likely play a role.⁹



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WHAT ARE THE IMPLICATIONS FOR POLICY?

Given the weak evidence for a causal relationship between youth marijuana use and subsequent use of other drugs, policymakers should not be overly concerned about the brain chemistry gateway effect.

However, legalization of marijuana could reduce the extent to which marijuana users are connected to peers who use and have access to illicit drugs, since such connections will no longer be necessary to obtain marijuana. So legalization of marijuana might be expected to reduce any such gateway. This would likely be true even for adolescent users, for whom access to marijuana would likely be more similar to current access to alcohol, whose suppliers are not typically involved in the sale of illicit drugs.

Moreover, legalization of marijuana may offer those whose genetic predisposition and circumstances result in cravings for psychoactive substances a much safer and less addictive alternative to opioids and other drugs with a greater potential for addiction and harm.



For more on cannabis policy, see reason.org/topics/drugpolicy



ENDNOTES

- ¹ Kandel, D. "Stages in adolescent involvement in drug use." *Science*. 1975. Vol. 190 (4217). 912-4. <http://science.sciencemag.org/content/190/4217/912.long>
- ² Lynskey, Michael T., et al. "Escalation of Drug Use in Early-Onset Cannabis Users vs Co-twin Controls." *Journal of the American Medical Association*. Vol. 289 (4). 2003. 427-433 at 432. <https://jamanetwork.com/journals/jama/fullarticle/195839>; Julia D. Grant, et al., "A Cotwin-Control Analysis of Drug Use and Abuse/Dependence Risk associated with Early-onset Cannabis Use," *Addictive Behaviors*. 2010. Vol. 35(1): 35-41. <https://www.sciencedirect.com/science/article/abs/pii/S0306460309002111>
- ³ Lynskey et al. 2003 at 430.
- ⁴ Joy, Janet E., Stanley J. Watson, Jr., and John A Benson, Jr., "Marijuana and Medicine: Assessing the Science Base," Division of Neuroscience and Behavioral Research, Institute of Medicine. Washington, DC: National Academy Press. 1999. at p. 99. <https://www.nap.edu/read/6376/chapter/5#99>
- ⁵ *Ibid.* at p. 6.
- ⁶ Maria Ellgren et al. "Adolescent Cannabis Exposure Alters Opiate Intake and Opioid Limbic Neuronal Populations in Adult Rats." *Neuropsychopharmacology*. 2007. Vol. 32: 607-615. <https://www.nature.com/articles/1301127>; Justine Renard et al. "What Can Rats Tell Us about Adolescent Cannabis Exposure? Insights from Preclinical Research." *The Canadian Journal of Psychiatry*. 2016. Vol. 61(6). 328-334. <http://journals.sagepub.com/doi/pdf/10.1177/0706743716645288>
- ⁷ Karen Van Gundy and Rebellon, Cesar J., "Life-course Perspective on the 'Gateway Hypothesis.'" *Journal of Health and Social Behavior*. 2010. Vol 51(3) 244-259. <http://journals.sagepub.com/doi/pdf/10.1177/0022146510378238>. Tarter, Ralph E. et al. "Predictors of Marijuana Use in Adolescents Before and After Licit Drug Use: Examination of the Gateway Hypothesis." *American Journal of Psychiatry*, Vol. 163(12). 2006. 2134-2140. <https://ajp.psychiatryonline.org/doi/abs/10.1176/ajp.2006.163.12.2134>. Degenhardt, L. et al. "Does the 'gateway' matter? Associations between the order of drug use initiation and the development of drug dependence in the National Comorbidity Study Replication." *Psychological Medicine*. 2009. Vol. 39(1): 157-167. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2653272/pdf/nihms88815.pdf>
- ⁸ Karen Van Gundy and Rebellon, Cesar J., "Life-course Perspective on the 'Gateway Hypothesis.'" *Journal of Health and Social Behavior*. 2010. Vol 51(3) 244-259.
- ⁹ Arpana Agrawal and Michael T. Lynskey, "Cannabis Controversies: How genetics can inform the study of comorbidity." *Addiction*. 2014. Vol. 109(3). 360-370. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3943474/>