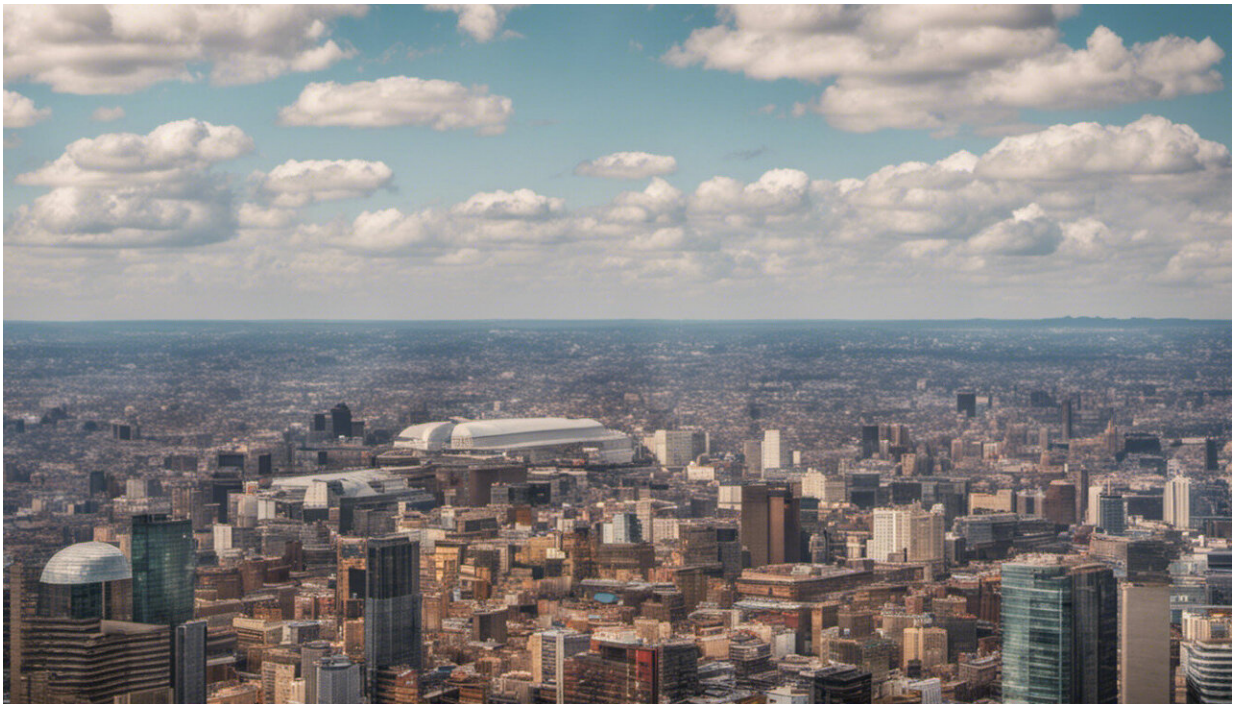


Vaping as a 'gateway' to smoking is still more hype than hazard

September 24 2015, by Lynn T Kozlowski



Credit: AI-generated image ([disclaimer](#))

As e-cigarettes become more popular, there has been a push to understand whether they are a "gateway" to regular, combustible cigarettes.

Two recent [studies](#) on [e-cigarettes](#) as gateways to [smoking](#) in teens and

[young adults](#) have made [headlines](#). And opponents of e-cigarettes have [welcomed](#) any crude signal of gateway effects.

As a [public health professor with related research](#) and interests in tobacco [policy](#) as well as in the complex factors that influence use of tobacco/nicotine [products](#), I want to offer some thoughts on this research. Looking for a gateway effect between e-cigarettes and smoking is understandable. But is it the best question to ask about e-cigarette use?

The studies

These studies find evidence for a small association (or limited gateway) between e-cigarette use in nonsmokers and a progression to trying cigarettes in a one-year study period.

The [more recent](#) of the two studies was published in September 2015 (authored by Primack et al), in *JAMA Pediatrics*. Researchers followed 694 12-26-year-olds for a year. None had tried cigarette smoking at the study's start, though 16 had tried e-cigarettes. (Perhaps the worthiest headline would be that only 2% of never-smokers tried e-cigarettes.)

A year later, 10% of the never-triers of e-cigarettes had taken at least one puff on a cigarette. But 38% (six of 16) of e-cigarette triers had taken at least one cigarette puff. This study focused on cigarettes and reports no information on prior hookah, cigar, marijuana, alcohol or smokeless tobacco use. If even two of the 16 were discounted because of prior use of other products, these results would likely be statistically insignificant.

The other [study](#) (authored by Leventhal et al) was published in August 2015 in *JAMA*. They followed 2,530 14-year-old school students for one year. None were smokers of any combustible tobacco products,

including cigars, hookah and cigarettes at the start of the study, but 222 had tried e-cigarettes.

After 12 months, 25% of the e-cigarette triers had smoked at least one puff of a smoked tobacco product, compared to only 9% of the non-e-cigarette triers.

'At least one puff'

Both studies found that young people who tried e-cigarettes were somewhat likelier to try smoked tobacco products, but that doesn't mean e-cigarettes are a substantial gateway to regular smoking.

Rather than reporting usual measures of current smoking (ie, any cigarettes in the past 30 days) or daily smoking, both studies used "[at least one puff](#)" or "just a few puffs" in the past [six months](#) or [lifetime](#).

It is as if an apple researcher thought "taking at least one bite of an apple in the past six months" was an important measure of initiation of apple eating.

But, research shows that a puff on one cigarette is crudely linked with daily [smoking](#). Following teenagers who had not yet puffed on a cigarette, they found that 48% took at least one puff in the 12-month follow-up period. But of those, only 20% became daily smokers.

Leventhal et al do acknowledge that future work needs to assess risks of "regular, frequent" smoking. Indeed, until we understand if the observed small gateway is only to experimentation or to frequent, dependent smoking, the more critical question is unanswered. In that only a subset of these observed gateway triers will move on to be regular smokers, it is almost certain that further follow-up of these samples will be unable to demonstrate a major gateway to heavy tobacco use.

Both studies also used a measure of "susceptibility" to smoking that is even more tenuously connected to becoming a future frequent smoker and also can be greatly [discounted](#) by assessing prior use of other drug products, including smokeless tobacco.

The gateways that aren't

The observed gateway effects in these studies at best indicate some small increased chances of future smoking for the minority of these e-cigarette triers – not large, inexorable movement toward cigarettes for the majority. In fact, drug [research](#) has generally turned away from the scientific usefulness of causal drug gateway models.

Gateway models began in the 1950s when drug enforcement authorities warned that marijuana use caused deadly heroin [use](#), which [has not been found](#) to be true.

Just as trying beer and liking it (or not) might incline one to try liquor (or not), prior use of one nicotine product can influence use of other nicotine products.

Drug research emphasizes so-called "[common liability models](#)" in which personal and contextual factors are taken into account as determinants of use or nonuse of products. While "products" themselves can influence the likelihood of using other products, it is important to consider "persons" as a factor determining use.

For example, if religious beliefs contribute to some teenagers not drinking alcohol, not smoking cigarettes, not using e-cigarettes, and at the same time lack of religious beliefs incline other teenagers to do these things, one would see an association between using these various products. Such an association is caused both by factors that influence nonuse of products as well as factors that influence use.

While these studies both attempted to different degrees to control contextual and personal factors that could be linked to smoking, this is easier said than done. The study from Leventhal et al does try to control for the use of alcohol, marijuana and smokeless tobacco (another nicotine product), but uses only one two-level measure of "any use" versus "no use" of all these products. Blunt tools lead to cruder results.

Science aside, gateway rhetoric has long been an important political [tool](#). Fears that e-cigarettes are gateways to smoking are being used to justify policy or [regulations](#). Yet, arguments for product regulations can be made forcefully, without needing to wave the gateway flag.

Where should research about e-cigarettes go?

Let's flip the question these studies asked. Instead of only asking whether nonsmoking e-cigarettes users move to smoking, why not explore whether higher-risk e-cigarette triers who have also tried smoked products are prevented from becoming established smokers? Such a question surely needs better than the "one puff" measures of product usage and recruitment to smoking.

Leventhal et al found that 75% (the large majority) of baseline e-cigarette users did not smoke at 12-month follow-up, compared to 91% of nonusers of e-cigarettes. But we don't know how many smokers who tried e-cigarettes in these age groups were still smoking (beyond a puff) in the future. By the limited logic of the current gateway research, patterns of reduced smoking for e-cigarette users compared to smokers could be interpreted as evidence of preventive effects.

What research should we be doing?

The tobacco and nicotine products are often already illegal for youth to

purchase. But these products are legal for adults. The focus on minor gateway effects for youth should not distract from the need to explore policy and clinical questions about harm and disease [risk from](#) adult use of legal tobacco products.

Cost, convenience, perceived risks (and official messages about risks) as well as personal preferences can influence which among many products are most [used](#).

It is important to understand interrelationships in tobacco/nicotine product use by adolescents and adults, but both the questions and measures need to be broadened. In addition to concerns for lower-risk youth, we need to assess patterns of product use in higher-risk youth who have tried multiple drugs (alcohol, marijuana, cigarettes, cigars, smokeless tobacco and hookahs) and often have [mental](#) health issues. We need to understand how best to prevent these youth from becoming regular users as adults of [deadly](#) smoked products.

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