

All gates lead to smoking:

the 'gateway theory', e-cigarettes and the remaking of nicotine

Kirsten Bell and Helen Keane

NOTICE: this is the author's version of a work that was accepted for publication in *Social Science and Medicine*. Changes resulting from the publishing process, such as peer review, editing, corrections, structural formatting, and other quality control mechanisms may not be reflected in this document. Changes may have been made to this work since it was submitted for publication. A definitive version was subsequently published in *Social Science and Medicine*, 2014, volume 119, pages 45-52. DOI: DOI: 10.1016/j.socscimed.2014.08.016 (<http://www.sciencedirect.com/science/article/pii/S0277953614005334>)

Abstract

The idea that drug use in 'softer' forms leads to 'harder' drug use lies at the heart of the gateway theory, one of the most influential models of drug use of the twentieth century. Although hotly contested, the notion of the 'gateway drug' continues to rear its head in discussions of drug use—most recently in the context of electronic cigarettes. Based on a critical reading of a range of texts, including scholarly literature and media reports, we explore the history and gestation of the gateway theory, highlighting the ways in which intersections between academic, media and popular accounts actively produced the concept. Arguing that the theory has been critical in maintaining the distinction between 'soft' and 'hard' drugs, we turn to its distinctive iteration in the context of debates about e-cigarettes. We show that the notion of the 'gateway' has been transformed from a descriptive to a predictive model, one in which nicotine is constituted as simultaneously 'soft' and 'hard'—as both relatively innocuous and incontrovertibly harmful.

Introduction

The idea that drug use in ostensibly harmless forms engenders more harmful drug use took hold in the twentieth century in tandem with increasing efforts to regulate and restrict drugs, reaching its epitome in the 'gateway theory' (also known as the 'gateway hypothesis'). As its name suggests, the assumption at the heart of this concept is that certain drugs act as a 'gateway' to the usage of other drugs. This notion is readily invoked in discussions of a variety of substances, from cigarettes and alcohol, to cannabis and solvents. It has also featured prominently in debates about newer products such as electronic cigarettes (or 'e-cigarettes'). However, although a seemingly straightforward theory, it is one with a complicated gestation and history.

In this paper we explore the history of this concept, highlighting the intersections between academic, media and popular accounts. We focus on the role of the gateway theory in not just *describing* relationships between forms of drug use but in *categorizing* different drugs and *constituting* them as harmful in particular ways. Our interest in the gateway theory and its effects on public discourse about drugs has been provoked by the debates about e-cigarettes and their relationship to smoking. As we aim to show in the second half of the paper, while the argument that e-cigarette use could lead to young people taking up smoking explicitly deploys the gateway theory, it is also quite different from earlier claims about 'soft' drugs as a stepping stone to 'hard' drugs.

Our exploration of the gateway theory and its re-emergence in debates about e-cigarettes is based on a critical reading of a range of texts, including scholarly literature and media accounts. Academic and policy literature on the gateway theory was found through searches of Google Scholar and media accounts were found through a search of LexisNexis. We also conducted Google Scholar searches to explore the literature

discussing e-cigarettes in the context of gateway usage, along with broader Google searches to examine the ways the term ‘gateway’ is currently being employed in the media—both in accounts of e-cigarettes and beyond them.

The analysis that follows is not intended to represent a comprehensive review of the literature on this topic, although we have tried to conduct our search of the relevant bodies of literature in a reasonably organized and logical fashion (further detail is provided in the relevant sections below). Importantly, our goal is not to prove or disprove the veracity of the gateway theory; instead, our approach to this subject matter is influenced by material-semiotic approaches which take account of the role of both signs and things in the production of reality (e.g. Latour, 2007; Fraser & valentine, 2008; Law, 2009). As Law (2009, p. 142) observes, “If all the world is relational, then so too are texts. They come from somewhere and tell particular stories about particular relations”. It is these stories we aim to explicate in the paper, focusing particularly on the ways that the concept has been continuously dismantled, reassembled and reappropriated, and its critical role in producing the notion of drug harms.

The origins of the gateway theory

Any consideration of the origins of the gateway theory must attend to its predecessor, the ‘stepping stone theory’, which formed the backdrop against which the notion of the ‘gateway drug’ emerged. The origins of the ‘stepping stone’ view of drugs are obscure, and sources attribute its roots differently. According to Sifanek and Kaplan (1995), the notion was initially articulated in a pamphlet printed by the U.S. Bureau of Narcotics in 1965 and asserted that drug users who begin with cannabis increase their risk of involvement with LSD, cocaine and heroin. However, Morral et al. (2002) suggest that the concern that marijuana use increases the risk of progressing to other more serious

drugs has influenced US drug policy since the 1950s, and Kandel (2002) and Anthony (2012) cite research suggesting that such assertions were made from at least the 1930s. Thus, it seems that the notion of a 'stepping stone' view of drugs drew much of its impetus largely from popular wisdom, which would have it that "a joint today means a junkie tomorrow" (Louiselle & Whitehead, 1971, p. 347).

The origins of the gateway theory are similarly opaque. Denise Kandel is typically credited with introducing the concept in a 1975 paper titled 'Stages in adolescent involvement in drug use' published in *Science* (e.g. van Bilson & Wilke, 1998; Golub & Johnson, 2002; Reid et al., 2007; Vanyukov et al., 2012). In many respects, the paper was set up as a rejoinder to the stepping stone theory, as Kandel began by referencing the widespread view that marijuana is "the first step in drug use", suggesting that this view was both "arbitrary and inadequately documented" (p. 912). Based on two longitudinal cohort surveys conducted with 6,453 students from 18 New York high schools, Kandel argued that adolescent drug use has four distinct stages, with adolescents proceeding from beer and wine, to hard liquor and cigarettes, to marijuana, to other illicit drugs (see figure 1). She concluded that if adolescents progress to marijuana use (stage 3), this greatly increased their likelihood of using other 'harder' illicit drugs—from about 2-3% to between 16-26%. According to Kandel, these stages were unaffected by gender, educational background or ethnicity, although she did allow that they were "probably culturally determined" (p. 914).

FIGURE 1 ABOUT HERE

Two features of this paper are worth highlighting. First, in contrast to the assumption of marijuana as an inexorable stepping stone to illicit drugs, Kandel made no claims about

a causal relationship between the stages of drug use. In her words, “although the data show a clear sequence in drug use, a particular drug does not invariably lead to other drugs higher up the sequence” (p. 914). Second, at no point did Kandel use the term ‘gateway’ in the article. As far as we have been able to ascertain, the notion of the ‘gateway drug’ first appeared in Robert DuPont’s 1984 book *Gateway Drugs: a Guide for the Family*, a self-help manual aimed at parents. However, some observers, including DuPont himself, indicate that the term was in use from the late 1970s (DuPont, Jaffe & Kleber, 1990; see also Zinberg, 1986-1987; Kandel, 1989). Therefore, it is likely that the book merely instantiated an idea in wider circulation in drug control discourse and policy. One fact that supports this interpretation is that DuPont was the Director of the National Institute on Drug Abuse and the White House Drug Czar for much of the 1970s.

As its title suggests, *Gateway Drugs: a Guide for the Family* presented gateway drugs as matters of fact that existed ‘out there’ in the world and whose major appeal lay in their seeming innocuousness, which served to ensnare unsuspecting young people (whom he deemed as being uniquely vulnerable to drug use/abuse). The political utility of the concept must have been readily apparent to DuPont. With a foreword by Ann Landers, and published as Nancy Reagan’s “Just Say No” campaign was building momentum, the book emphasized the “unique dangers” of “safe-seeming drugs” (p. 18), although cocaine and amphetamines were included along with alcohol and marijuana as gateway drugs. While acknowledging the multi-causal nature of the “drug epidemic”, DuPont simultaneously highlighted the role of intoxication in causing physically-based dependence and ‘harder’ drug use. DuPont’s underlying emphasis on causal biochemical mechanisms was evident in an interview about the book published in the *Washington Post* in 1985, where he warned that: “there’s no telling when the ‘addiction switch’ will turn on” (Weber, 1985).

All this would suggest that what is today labeled the 'gateway theory' represents the convergence of a distinct series of accounts, from lay models of drug use (the notion of the 'stepping stone'), academic theories (Kandel's 'stages of progression' model) and political constructs (DuPont's 'gateway drugs'). In part, its success rests on its compatibility with popular views of deviance, in which escalation is a common theme. Drug use fits particularly well with ideas of escalation from the seemingly innocuous to the profoundly destructive because drugs are viewed as causal agents in a wide range of "calamities and failures of responsibility", including violence, crime, school failure, family conflict and illness (Room, 2005, p. 149). In addition, drug use is inevitably linked with addiction, understood as an inexorable decline from normality to 'rock bottom' (Keane, 2002). In this cultural and discursive context, the gateway concept makes sense as a description and prediction of problematic behavior.

Academic and policy literature on the gateway theory

Interest in the idea of the 'gateway theory' or 'gateway drugs' has flourished over the past three decades amongst researchers, clinicians and policy makers. Although it is beyond the scope of this paper to attempt a detailed analysis of the concept in the academic and policy literature, in an attempt to identify broad trends, we conducted Google Scholar searches of both terms in May 2014, limiting ourselves to documents published between 1975 and 2000, which arguably represents the concept's formative period. Google Scholar has the advantage of capturing a variety of different kinds of sources, from academic articles and books to 'grey' literature, and the list of citations it generates includes fragments of text where the search term is being used. After removing irrelevant citations (e.g. ones on the gateway theory of pain) and those not in English, approximately 700 citations remained. These citations form the basis of the

discussion that follows—although we examined the original source material in instances where it was unclear how the concept was being used in the textual fragment captured by Google Scholar.

Our analysis suggests that the notion of ‘gateway drugs’ has generally resisted becoming a fact in Fleck (1979) or Latour’s (1987) sense, where concepts are invoked without any trace of ownership, construction, or time and place, as if it “could have been known for centuries or handed down by God Himself together with the Ten Commandments” (Latour, 1987, p. 23). Although it was not uncommon to see the term employed in this fashion, in 75 percent of the citations it was marked in some way. Beyond the many instances where it was explicitly treated as a “theory” or “hypothesis”, it was often placed in scare quotes, and generally preceded by disclaimers such as “so-called”, “considered” or “supposed”.

Importantly, while the reality of gateway drugs is commonly treated as questionable, the existence of a named gateway theory (as with the stepping stone theory before it) is not. Yet, as we have shown, no such named theory was initially posited. It is therefore clear that subsequent scholars writing on the topic actively produced the notion of a ‘gateway theory’ to describe a distinct series of ideas about progression in drug use. For example, in a paper on adolescent drug use published following DuPont’s book, Oetting and Beauvais (1986) discussed a cluster of “gateway theories”, noting that numerous scientists had observed:

...a remarkably orderly progression from one drug to another as young people get more and more heavily involved with drugs. This observation has been variously labeled the *gateway* (DuPont, 1984), *stepping stone* (O’Connell &

Clayton, 1982), and *precursors* (Kandel, Kessler, & Margulies, 1978) hypothesis (pp. 17-18, emphasis and citations in original).

Although this statement acknowledged that these were distinct accounts and source material was provided for each one, it simultaneously elided their differences through the framing of these observations as a singular 'hypothesis'. Similarly, in an article on gender and teenage smoking, Gritz (1986) noted that:

The gateway theory of substance use predicts the order in which licit and illicit drugs are introduced, and analyses have been performed on continuation and discontinuation patterns (Jessor and Jessor 1977; Kandel 1978; Kandel and Logan 1984; O'Malley et al. 1984) (p. 74, citations in original).

As Latour (1987, p. 29) has shown in his work on fact-making, "the fate of what we say and make is in later users' hands". Thus, facts are made in part out of what we do with prior statements: taking them up, rejecting them, reopening them, dropping them, making them more solid by grasping them without further discussion, or transforming them entirely. Oetting and Beauvais (1986) and Gritz's (1986) statements therefore show us a fact *in the process of being made*. For example, although none of the articles cited in Gritz's statement are about a gateway theory of substance use, through her "context of citation" (Latour, 1987, p. 35) she treats these references as developing a "gateway theory of substance use". Thus, the descriptive act is actually a productive one, serving to instantiate the notion of a gateway theory.

Kandel herself actively contributed to the life of the theory, titling her 1992 co-authored paper "States of progression in drug involvement from adolescence to adulthood: Further evidence for the gateway theory" (Kandel, Yamaguchi & Chen, 1992).

Subsequent accounts accepted these statements and they continued to be "eroded and

polished” over time (Latour, 1987, p. 42). And so it was that the gateway theory became “tacit knowledge” (Latour, 1987, p. 43): a fact whose existence was universally accepted and required no citation. In consequence, for the most part it is treated as a timeless, placeless, ownerless concept whose meaning is both transparent and self-evident.

Despite this assumption of transparency, given the different propositions that collectively made up the gateway theory, the concept means different things to different people. It is no wonder that Hall and Lynskey (2005, p. 39) observe that,

The gateway hypothesis has been one of the most controversial hypotheses in the epidemiology of drug use. This has been in part because proponents and opponents of the hypothesis have not always been clear about what the hypothesis means and what policies it entails.

Nevertheless, in general, the theory encompasses a set of related propositions.

According to Kandel (2002, 2003), it involves two elements: 1) sequencing of initiation of use between drug classes, and 2) association in the use of drugs, such that use of a drug lower in the sequences increase the risk of using drugs higher up the chain.

Kandel is careful not to argue for a causal relationship, noting that: “given the difficulties of establishing true causality in the social sciences, the term *association* rather than *causation* is emphasized” (Kandel, 2002, p. 4, emphasis in original).

However, as Vanyukov and colleagues (2012) observe, while those endorsing the gateway theory (including Kandel herself) often avoid explicit assertions of causality, it is common to see implicit causal claims; thus, expressions like “leads to”, “progresses to”, “predicts”, “increases the risk of”, “stages of progression”, “a causal chain sequence” are common. This “cavalier approach” towards association is a common feature of epidemiological studies (Davey-Smith and Phillips, 1992, p. 759). However, even when

epidemiologists studying drug use refrain from drawing hasty conclusions about possible links between causes and effects, their findings are quickly put to political work. To quote Peretti-Watel (2011, p. 61), “any figures published are liable to be held up as ‘scientific’ and immediately reinterpreted in policy-making circles, not to mention the heavy implications often attached to them when they begin to circulate in the media”.

Despite media and policy claims to the contrary, the exact nature—and implications—of the association are quite unclear. For example, Hall and Lynskey (2005) suggest that there are three main types of explanation for the association between cannabis and other illicit drug use (arguably the most politicized ‘gateway’ relationship). First, social environment explanations posit that cannabis users have more opportunity to use illicit drugs because they are supplied by the same black market, and because of shared peer networks they are more exposed to illicit drug use. Second, other explanations focus on the individual characteristics of cannabis users, suggesting that there is something about users that makes them more likely to use illicit drugs. In other words, there is a third variable (e.g. a genetic predisposition to risk taking or a shared problematic environment) which causes both cannabis and other illicit drug use. Finally, biochemical/pharmacologic explanations suggest that cannabis use produces changes in the brain that sensitize users to the rewarding effects of other drugs. These explanations draw much of their impetus from experiments with rats suggesting that “marijuana manipulates the brain’s stress and reward systems in the same way as more potent drugs, to keep users coming back for more” (Wickelgren, 1997, p. 1967).

The gateway theory and conceptions of ‘hard’ and ‘soft’ drugs

Questions of causality aside, there is empirical support for a patterned sequence in drug use in western countries, although this pattern is certainly not universal (see Degenhardt

et al., 2010; Vanyukov et al., 2012). However, what does this actually tell us about drug use beyond the fact that some users tend to experiment with different types of drugs? In many respects, the gateway theory is a kind of epidemiological “black box” (Peretti-Watel, 2011). As Vanyukov et al. (2012, p. S5) observe,

The ‘stages’ are defined in a circular manner: a stage is said to be reached when a certain drug(s) is used, but this drug is supposed to be used only upon reaching this stage. In other words, the stage both is identified by the drug and identifies that drug. In effect, the drug is identical to the stage... There is no process or organismic characteristic, separate from drug use per se, which is presumed to cause or underlie the supposed developmental staging indicated by, and identical to, drug milestones.

Although the defining characteristic of the gateway theory is a movement from ‘softer’ to ‘harder’ drugs, closer examination reveals that these categories, while generally treated as self-evident, are curiously slippery. In many contexts the distinction is treated as synonymous with the move from licit to illicit drugs—a view which underwrites Kandel’s stages model of drug use (see Figure 1). Yet, ‘hardness’ seems to frequently be conflated with ‘intoxicating’, and ‘softness’ seems to be used as synonymous with readily available/accessible drugs (e.g., DuPont, 1984). In other treatments, still, ‘hardness’ seems to relate to the idea of ‘addictiveness’ or alternatively hinges on the notion of a ‘less dangerous’/‘more harmful’ binary (Shiner & Newburn, 1997; Hartney, 2012). Distinctions are also made between different routes of administration, with injected drugs being identified with ‘hardness’—both in drug policy (Fraser et al., 2004) and amongst drug users themselves (Peretti-Watel & Moatti, 2005). Clearly, depending on the particular frame used, the actual drugs populating the stages in the progression from softer to harder drugs might look rather different.

Moreover, it is common to see these multiple and internally contradictory meanings invoked in a single given account. *Getting Tough on Gateway Drugs* is a case in point, as DuPont (1984) seems to distinguish ‘soft’ and ‘hard’ drugs in at least distinct three ways in the book. Thus, he initially differentiates such drugs based on “their most prominent effects on the brain or the central nervous system” (p. 9); however, later he seems to evoke a cultural model of “safe” and “scary” drugs based not on their pharmacological properties but popular perception. In his words:

Another key to understanding which drugs emerged as major drug problems during the last two decades is the image each drug had. Drugs that were perceived as ‘safe’ and ‘fun’ shot ahead of drugs considered ‘dangerous’. Thus, marijuana, cocaine, and—to a lesser extent—Quaaludes and stimulants like amphetamines shot far ahead of scarier drugs such as heroin, LSD, PCP, and even barbiturates (p. 18).

Finally, he seems to differentiate addictive drugs from intoxicating ones, focusing on the latter as ‘gateways’. It is for this reason that he downplays the role of tobacco as a gateway drug, because it does not produce intoxication (p. 32).

All this would suggest that a kind of collapsing of socio-legal, cultural and pharmacological categories has happened in the notion of gateway drugs, without adequate recognition of this conflation. The slipperiness of what constitutes a softer vs. harder drug also means that the theory has considerable utility in directing attention towards whichever drug happens to be the focus of political ire. Indeed, as we have already seen, the origins of the ideas promulgated in the form of the ‘stepping stone theory’ and ‘gateway drugs’ were fundamentally political. As Anthony (2012, p. S101) highlights, the origins of the gateway theory lie in “the imaginations of politicians and

policy makers". Drug control policy's system of classifications relies on a vision of drugs as more or less harmful because of internal properties such as 'abuse potential'. Thus, one of the most important effects of these different iterations of the gateway theory is to produce and naturalize the identity of certain substances as 'soft' (i.e. less inherently harmful but dangerous because of their role in the path of drug use) and other substances as 'hard' (i.e. inherently harmful).

The seductiveness of the 'gateway' trope: the media's uptake of the concept

As the preceding account makes clear, the notion of the 'gateway drug' was never a purely academic concept, but rather a hybrid of political, popular and academic accounts. The media has therefore had an important role to play in disseminating and popularizing the term. A LexisNexis search of media references to "gateway AND drug" in October 2013 placed the first reference to the concept in a *Washington Post* article in 1985 discussing DuPont's book (Weber, 1985). "Gateway drugs" were also mentioned in US newspaper articles in both 1986 and 1989 (Braham, 1986; Schissler, 1989), with alcohol, cigarettes and marijuana all singled out as "gateways" or "bridges" to drugs such as heroin and cocaine. These accounts tended to highlight the biochemical properties of these drugs as explanations for their "gateway effects". For example, a 1989 *New York Times* article emphasized the ways in which alcohol "accustoms young people to the feelings of mood alteration, so they are often wide-eyed to try other drugs, a colorful assortment of pills, potions and powders" (Schissler, 1989). In each instance, the existence of gateway drugs were taken as given, rather than presented as a hypothesis or theory.

Although sporadic mentions occurred in the early 1990s, it wasn't until 1994 that the term was referenced more frequently in print news, and from 1997 gateway drugs were

frequently discussed, with cigarettes and marijuana most commonly singled out as culprits and explanations tending towards the biochemical, an orientation that likely reflects the increasing prominence of neuroscientific research during “the decade of the brain” (see Keane, 1999). Gateway drugs, the reader was often informed, “prime the brain” or create “neuro-chemical pathways” for addiction (e.g., Morgan, 1997; Dayton, 1997). The emphasis on cigarettes as a gateway drug in media reports seems to be partially an artifact of proposed changes in tobacco control legislation and the political utility of the concept in promoting them. Thus, in 1996 when the Clinton administration took steps to assert FDA jurisdiction over tobacco, arguments about tobacco as a gateway drug were common (e.g. Fagan, 1996; Siemaszko, 1996; Sims & Brogan, 1996). For example, an article published in the Canadian national newspaper *The Globe and Mail* discussing the FDA regulation quoted an official stating that: “The gateway drug in all substance abuse is basically smoking” (Fagan, 1996).

Nevertheless, in contrast to earlier references to the term, from the mid 1990s gateway drugs were often presented as contested substances, although this was more common in accounts of cannabis than tobacco (e.g. Massing, 1996; Brighton, 1997). For example, a *New York Times* article published in 1996 stated that there was “Little evidence to support the claim that marijuana is a ‘gateway drug’” (Massing 1996). In 1997 a letter to the editor published in *The Gazette* argued that characterizations of pot as a gateway drug could also be made for cigarettes, coffee, sex, regular jogging, and “a great plateful of fries and gravy” (Korhonen, 1997). Indeed, over time there has also been a broadening of the concept and the trope of the “gateway substance” now extends well beyond the realm of drugs into other ‘suspect’ practices—although such accounts are informed by ideas about addiction, compulsion and deviance. Thus, conservative commentators characterize video games as a “gateway drug” to real-life violence (Wilkie

& Blumenthal, 2013). Likewise, pornography is described as a “gateway drug” to promiscuity (sexandthestate.com, 2013) and conservative Christians now talk of “gateway sins”, defined as “an unhealthy habit that at first seems innocent, but its continuation may lead to the indulgence of other sins” (urbangospelmission.com, 2012). Indeed, today it appears that pretty much any activity seen to ‘encourage’ or ‘facilitate’ entrée to another activity (generally one deemed to be compulsive or socially undesirable) can be conceptualized through the metaphor of the gateway drug; for example, articles talk of LinkedIn as a “gateway drug” to social media (Rudin, 2012).

Clearly, as an account of human behavior, there is a degree of seductiveness to the idea that exposure to a single substance will lead people inexorably down a path of vice they would not otherwise have succumbed to (whether it be addiction, promiscuity, violence, and so on). For if the substance is the problem, the answer then becomes simple: limit exposure. Although the breadth of the gateway trope would suggest a dampening of the meaning of the concept, its potency nevertheless comes in part from its veneer of scientific credibility. This is particularly evident in the ways the concept has been re-energized in the context of debates about e-cigarettes.

The resurrection of the gateway theory in e-cigarettes

Electronic cigarettes are a product launched in 2006 by a Chinese electronics company. While some models resemble cigarettes, they do not involve combustion but are battery-powered devices that deliver nicotine via an inhaled mist. Opinion on e-cigarettes has quickly polarized. While some tobacco harm reduction advocates have embraced e-cigarettes as a safer alternative to smoking cigarettes, for many working in the field of tobacco control they are merely the latest incarnation of the tobacco ‘menace’: an untested product with the potential to enslave ever-greater numbers of people—

especially adolescents—to a dangerous addiction (see Bell & Keane, 2012). As Borland (2011) observes,

People who argue that research is needed first focus primarily on the risks—the lack of research on product safety and on the efficacy of e-cigarettes as cessation aids or as substitutes, and concern about them being a potential gateway to nicotine dependence for the young.

Despite these concerns, evidence that e-cigarettes lead one inexorably down a path towards smoking is very limited. One highly-publicized study by the Centers for Disease Control and Prevention (CDC) found that the percentage of US high school students who reported ever using an e-cigarette rose from 4.7 percent in 2011 to 10.0 percent in 2012 and high school students using e-cigarettes within the past 30 days rose from 1.5 percent to 2.8 percent and doubled among middle school students (Corey et al., 2013). Although only 9.3% of e-cigarette users had never reported smoking a cigarette (i.e. less than 1% of the total respondents), the report ends with an ominous warning about the “risk for nicotine addiction and initiation of the use of conventional cigarettes or other tobacco products”. In a press release about the study, Tom Frieden, the CDC Director, stated: “Nicotine is a highly addictive drug. Many teens who start with e-cigarettes may be condemned to struggling with a lifelong addiction to nicotine and conventional cigarettes” (CDC, 2013). The press has been quick to take up the study’s findings, with headlines screaming: “E-cigarettes: healthy tool or gateway device?” (CNN, 2013) and “E-cigarettes: a gateway to nicotine addiction?” (The Week, 2013).

This leap from e-cigarette usage—or even awareness—to full-blown cigarette usage is readily made in other empirical research. For example, in a recent study of US adolescent males’ awareness of and willingness to try e-cigarettes, Pepper et al. (2013)

found that very few adolescents had used the devices (<1%) but 18% indicated their willingness to experiment with them. They conclude: “Given that even experimentation with e-cigarettes could lead to nicotine dependence and subsequent use of other tobacco products, regulatory and behavioral interventions are needed to prevent ‘gateway’ use by adolescent nonsmokers” (p. 144). A similar sort of logic is evident in a recent study of e-cigarette awareness and usage in South Korea (Lee et al., 2013). In a survey of 75,643 students, the researchers found that 9.4% of students had ever used an e-cigarette, although the vast majority of these students also smoked cigarettes; only 1.4% of students who had never smoked had used an e-cigarette. Yet, based on this finding the authors conclude that: “e-cigarettes represent a new pathway for young people to become addicted to nicotine” (p. 4).

Likewise, a recent systematic review of empirical research (Pepper & Brewer, 2013) discusses two studies in the context of “gateway use”. Outlining the findings of a study of 179 e-cigarette users in Poland (Goniewicz et al., 2013), the reviewers note that 25 participants reported that they were non-smokers when they began using e-cigarettes and 5 of these people currently reported smoking cigarettes. They then describe the findings of a focus group study on young adults’ perceptions of smokeless tobacco and e-cigarettes (Choi et al., 2012), noting that the participants believed that these might appeal to non-smokers and lead them to becoming smokers. Based on these studies, the reviewers highlight the existence of specific “vulnerable populations”, including “non-smokers who could begin smoking as a result of developing nicotine addiction from ENDS [electronic nicotine delivery system] use” (p. 7). However, the authors of the Polish study explicitly state that their survey “did not ask participants who reported no smoking at the time of starting the e-cigarette use about their smoking history. It is likely that most or all of these respondents were smokers who were in the process of trying to

quit” (Goniewicz et al., 2013, 138). Moreover, the focus group study (Choi et al., 2012) did not focus on actual e-cigarette usage but young adults’ *perceptions* of the products. Although no available studies examine patterns of e-cigarette and cigarette usage in a longitudinal fashion, virtually all assume the following inviolable chain reaction: awareness of e-cigarettes → experimentation with e-cigarettes → nicotine dependence → smoking.

These concerns about the “gateway potential” of e-cigarettes pervade discussions of e-cigarettes (see Etter & Bullen, 2011; Etter et al., 2011; Limb, 2013). Although such concerns are most commonly expressed through the metaphor of the gateway drug, a related concern is that they will act as a “starter product” for combustible cigarettes (e.g. Pearson et al., 2012; Henningfield & Zaatari, 2010). For example, Henningfield and Zaatari (2010, p. 89) state that: “ENDS [electronic nicotine delivery systems] that deliver very low levels of nicotine may pose effective starter products for non-tobacco users. Self-administering nicotine by puffing on ENDS could initiate a nicotine graduation process”. The underlying concern in both instances is that non-smokers may use e-cigarettes, become ‘hooked’ on nicotine and then turn to ‘real’ cigarettes to feed their addiction. Interestingly, in many of these accounts, the emphasis on adolescent usage so integral to the initial conception of the gateway theory seems to have disappeared entirely, with e-cigarette users of any age deemed to be at risk of progression to full-blown cigarette usage.

Moreover, unlike the notion of sequenced pattern of drug use from licit to illicit drugs, the ‘gateway’ is invoked here quite explicitly as a *predictive* model rather than an *empirically-driven* one. In other words, it entails a prediction of what will happen, rather than an explanation of a documented pattern of drug use. Yet, the term is treated as if it speaks

to an empirical truth regarding the future of the e-cigarette user, one that policy makers have a responsibility to pre-empt via regulations to restrict the promotion and sale of e-cigarettes.

Nicotine and reconceptualizations of ‘hardness’

Another notable difference between invocations of the ‘gateway’ in the context of e-cigarettes is the general absence of any reference to the concept’s initial orientation towards illicit drugs, where gateway drugs induce a continuous movement towards ‘harder’ drugs (however that be defined). Only rarely is the specter of escalating drug abuse invoked—and such speculation is limited to media reports. For example, a recent NBC news article on e-cigarettes discusses a “life-long marijuana user” who uses his e-cigarette to vape marijuana in public and concludes with a warning from New York State Assemblywoman Linda Rosenthal: “Once you try electronic cigarettes, you can become hooked to them, move on to cigarettes *and then move on to other drugs*” (Givens & Cheng, 2013, emphasis added). Nevertheless, for public health and tobacco control advocates, the outcome that has everyone concerned is “a lifelong addiction to nicotine and conventional cigarettes” (CDC, 2013). Here, cigarettes—initially perceived as a ‘soft’ gateway to ‘harder’ drugs—have become the incontrovertibly harmful outcome that renders the earlier practice risky.

In some respects, the debates about e-cigarettes are indicative of an underlying transformation in the notion of ‘hardness’, wherein nicotine has been repositioned as a stigmatized and socially unacceptable ‘hard’ drug, at least when contained in cigarettes. This is symptomatic of a larger reevaluation of nicotine in the 1990s and its discursive shift in status from a ‘habituating’ drug to an ‘addictive’ one (see Luik, 1996; Bell & Keane, 2012). The notion of the ‘social smoker’ has been discredited as anything except

a transitional phenomenon in mainstream tobacco control (McCullough, 2011) and teenagers are warned that even smoking a few cigarettes can produce nicotine dependence (DiFranza et al., 2002). This reevaluation of nicotine has meant that its status as a ‘softer’ drug than cannabis in academic and policy circles—and, increasingly, the public imagination as well—is certainly up for debate, and researchers have now begun to talk of marijuana as a “reverse gateway” to cigarettes (e.g., Humfleet & Haas, 2004; Patton et al., 2005; Viveros et al., 2006).

Yet, although the invocation of the ‘gateway’ has been particularly frenzied in the context of media and policy discussions of e-cigarettes, we want to emphasize that this idea of nicotine as a gateway to smoking is not especially new. In many respects, the current concerns about the gateway potential of e-cigarettes closely echo the longstanding debates about the role of smokeless tobacco in facilitating the uptake of smoking, a question which has formed the focus of no small amount of research (e.g., Haddock et al., 2001; Kozlowski et al., 2003; Tomar, 2003; Melikian & Hoffmann, 2009; Timberlake, Huh & Lakon, 2009). Moreover, the dividing lines are largely unchanged, with proponents of tobacco harm reduction suggesting that these substances will reduce the toll exacted by smoking by encouraging users to switch to less hazardous forms of nicotine and opponents arguing that they will ultimately spawn more smokers.

Interestingly, such concerns were *also* evident in earlier debates about nicotine replacement therapy (NRT) products, despite their medicinal status. Thus, when Nicorettes were first introduced in the US in 1984, the FDA mandated that they could only be purchased by prescription, which was also the case for the nicotine patches introduced between 1991-1992. By limiting access in this way, the explicit goal was to minimize the potential for “abuse” of these products amongst certain populations and to

ensure that smokers did not engage in “improper use” (Shiffman et al., 1997, p. 306). Concerns about the potential for youth uptake were a particularly prominent feature of the 1996 FDA hearings to make various NRT products (gum and patches) available for over-the-counter purchase. The assumption was that open access to NRT would encourage teenagers to (ab)use the product (Shiffman et al., 1997; Shiffman & Sweeney, 2008). Underlying such concerns about youth uptake was the assumption that NRT would potentially act as a ‘gateway’ to smoking (see Klesges et al., 2003; Adelman, 2004; Hyland et al., 2006).

In these accounts, nicotine is revealed not as a stable substance but as one whose effects vary based on the specific networks in which it is embedded. As Keane (2013, p. 190) has previously argued:

The categories of good and bad nicotine are precarious and contingent because of their reliance on the assemblage of elements such as drug effects, technological and clinical innovations, habits of tobacco consumption, regulatory frameworks and the interests of both tobacco and pharmaceutical companies in the smoking cessation/smoking reduction market.

The nicotine in NRT products is ‘good’ because it weans smokers off the ‘bad’ nicotine in cigarettes and ideally nicotine itself (although it becomes ‘bad’ if smokers merely shift their nicotine addiction from cigarettes to Nicorettes). On the other hand, the nicotine in e-cigarettes is ‘bad’ because it facilitates addiction to nicotine, which, in turn, drives the user to seek it in ‘harder’ or more dangerous forms. And the nicotine in cigarettes is ‘bad’ because it keeps the smoker using cigarettes. Thus, in relation to e-cigarettes and smoking, the invocation of the ‘gateway’ is a critical means of establishing the potential risks and dangers of both forms of nicotine use.

Conclusion

Although the concept of the gateway theory is often treated as a straightforward scientific theory, its emergence is rather more complicated. In effect, it is a hybrid of popular, academic and media accounts—a construct retroactively assembled rather than one initially articulated as a coherent theory. We have argued that what the gateway theory *is* and what it *means* is neither fixed nor stable. However, rather than detracting from its utility, this instability has been central to the continued productivity of the concept and its capacity to promote certain understandings of new forms of drug use structured around notions of harm, especially to young people. By producing a simple narrative of escalating drug use, the gateway theory allows for quite different and specific processes (biological, legal, social and cultural) to be collapsed into a unified discourse of risk and harm.

These processes crystallize clearly in recent debates about e-cigarettes, where the gateway theory has been taken up in quite distinctive ways. Treated as a predictive rather than a descriptive model, concerns center on e-cigarettes as a ‘gateway’ or starter product for combustible cigarettes. Most intriguing about the deployment of the concept in this context is that the ‘gateway’ in question is *from* nicotine *to* nicotine. In this framing, nicotine is constituted as simultaneously ‘soft’ and ‘hard’—as both relatively innocuous and incontrovertibly harmful. We have suggested that this path demonstrates and reproduces the changed status of smoking from its earlier identity as a precursor of harmful drug use to a form of harmful drug use in itself. It also reveals the complexity of nicotine as an addictive substance which has been conceptually separated from the most prominent harms of smoking, but which is always seen to potentially spawn itself in new and more dangerous forms.

References

Adelman, W.P. (2004). Nicotine replacement therapy for teenagers: About time or a waste of time? *JAMA Pediatrics*, 158(3), 205-206.

Anthony, J.C. (2012). Steppingstone and gateway ideas: a discussion of origins, research challenges, and promising lines of research for the future. *Drug & Alcohol Dependence*, 123S, S99-S104.

Bell, K. & Keane, H. (2012). Nicotine control: E-cigarettes, smoking and addiction. *International Journal of Drug Policy*, 23(3), 242-247.

Borland, R. (2011). Electronic cigarettes as a method of tobacco control. *British Medical Journal*, 343, d6269.

Braham, J. (1986). Drug firm fights drugs; Marion Labs teaches students how to say no. *Industry Week*, August 4, 24.

Brighton, J.D. (1997). Politics of pot. *Newsweek*, February 24, 16.

CDC (2013). E-cigarette use more than doubles among U.S. middle and high school students from 2011-2012. *CDC Newsroom*.

<http://www.cdc.gov/media/releases/2013/p0905-ecigarette-use.html> (accessed 12 December 2013).

Choi, K., Fabian, L., Mottey, N., Corbett, A., & Forster, J. (2012). Young adults' favorable perceptions of snus, dissolvable tobacco products, and electronic cigarettes: findings

from a focus group study. *American Journal of Public Health*, 102, 2088–93.

CNN (2013). E-cigarettes: healthy tool or gateway device?

<http://www.cnn.com/2013/09/12/health/e-cigarettes-debate/index.html> (accessed 12 December 2013).

Corey, C., Wang, B., Johnson, S.E., Apelberg, B., Husten, C., King, B.A., et al. (2013). Notes from the field: Electronic cigarette use among middle and high school students — United States, 2011–2012. *Morbidity & Mortality Weekly Report*, 62(35), 729-30.

Davey Smith, G. & Phillips, A.N. (1992). Confounding in epidemiological studies: why 'independent' effects may not be all they seem. *British Journal Journal*, 305, 757-759.

Dayton, L. (1997). Pot leads to harder drugs, say researchers. *Sydney Morning Herald*, June 28, 7.

Degenhardt, L., Dierker, L., Chiu, W.T., Medina-Mora, M.E., Neumark, Y., Sampson, N., et al. (2010) Evaluating the drug use 'gateway' theory using cross-national data: Consistence and associations of the order of initiation of drug use among participants in the WHO World Mental Health Surveys. *Drug & Alcohol Dependence*, 108(1-2): 84-97.

DiFranza, J. R., Savageau, J. A., Fletcher, K., Ockene, J. K., Rigotti, N. A., McNeill, A. D., Coleman, M., & Wood, C. (2002). Measuring the loss of autonomy over nicotine use in adolescents: the Development and Assessment of Nicotine Dependence in Youths (DANDY) Study. *Archives of Pediatric Adolescent Medicine*, 156, 397–403.

DuPont, R.L. (1984). *Getting tough on gateway drugs: a guide for the family*.

Washington, DC: American Psychiatric Press.

DuPont, R.L., Jaffe, J.H. & Kleber, H.D. (1990). NIDA's role in applied research. In Gust, S.W., Walsh, J.M., Thomas, L.B. & Crouch, D.J. (Eds.), *Drugs in the workplace:*

Research and evaluation data. Volume II (pp. 225-240). Rockville, MD: National Institute on Drug Abuse.

Etter, J.-F. & Bullen, C. (2011). Electronic cigarettes: Users' profile, utilization, satisfaction and perceived efficacy. *Addiction*, 106(11), 2017-2028.

Etter, J.-F., Bullen, C., Flouris, A.D., Laugesen, M., & Eissenberg, T. (2011). Electronic nicotine delivery systems: a research agenda. *Tobacco Control*, 20, 243-248.

Fagan, D. (1996). Tobacco industry suffers new blow Clinton expected to tighten rules.

The Globe and Mail, August 22, A14.

Fleck, L. (1979). *Genesis and development of a scientific fact*. Chicago: University of Chicago Press.

Fraser, S., Hopwood, M., Treloar, C. & Brener, L. (2004). Needle fictions: Medical constructions of needle fixation and the injecting drug user. *Addiction Research & Theory*, 12(1), 67-76.

Fraser, S. & valentine, k. (2008). *Substance & substitution: Methadone subjects in liberal*

societies. Basingstoke: Palgrave Macmillan.

Givens, A. & Chang, P-S (2013). I-Team: e-cigarettes, used to smoke marijuana, spark new concerns. *NBC New York*. <http://www.nbcnewyork.com/investigations/ECigarettes-Drugs-Marijuana-Vapor-Pens-Smoking-I-Team-227269001.html> (13 December 2013).

Golub, A. & Johnson, B.D. (2002). The misuse of the 'Gateway Theory' in US policy on drug abuse control: a secondary analysis of the muddled deduction. *International Journal of Drug Policy*, 13, 5-19.

Gritz, E.R. (1986) Gender and the teenage smoker. In B.A. Ray & M.C. Braude (Eds.), *Women and drugs: a new era for research* (pp. 70-79). NIDA Research Monograph 65. Rockville, MD: National Institute on Drug Abuse.

Goniewicz, M.L., Lingas, E.O., & Hajek, P. (2013). Patterns of electronic cigarette use and user beliefs about their safety and benefits: an Internet survey. *Drug & Alcohol Review*, 32:133–40.

Haddock, C.K., Weg, M.V., DeBon, M., Klesges, R.C., Talcott, G.W., Lando, H., & Peterson, A. (2001). Evidence that smokeless tobacco use is a gateway for smoking initiation in young adult males. *Preventive Medicine*, 32, 262-267.

Hall, W.D. & Lynskey, M. (2005). Is cannabis a gateway drug? Testing hypotheses about the relationship between cannabis use and the use of other illicit drugs. *Drug & Alcohol Review*, 24, 39-48.

Hartney, E. (2012). What is the difference between soft drugs and hard drugs? *About.com*. <http://addictions.about.com/od/legalissues/f/What-Is-The-Difference-Between-Soft-Drugs-And-Hard-Drugs.htm> (accessed 10 November 2013).

Henningfield, J.E. & Zaatari, G.S. (2010). Electronic nicotine delivery systems: Emerging science foundation for policy. *Tobacco Control*, 19(2), 89-90.

Humfleet, G.L., & Haas, A.L. (2004). Is marijuana use becoming a 'gateway' to nicotine dependence? *Addiction* 99, 5–6.

Hyland, A., Bradford, D., & Bradford, D. (2006). Drug counselor report of adolescents abuse of nicotine replacement therapy. *Journal of Addictive Diseases*, 24(4), 105-113.

Kandel, D. (1975). Stages in adolescent involvement in drug use. *Science*, 190(4217): 912-914.

Kandel, D.B. (1989). Issues of sequencing of adolescent drug use and other problem behaviors. *Drugs & Society*, 3(1-2), 55-76.

Kandel, D.B. (2002). Examining the Gateway Hypothesis: Stages and pathways of drug involvement. In D.B. Kandel (Ed.), *Stages and pathways of drug involvement: Examining the Gateway Hypothesis* (pp. 3-14). Cambridge, UK: Cambridge University Press.

Kandel, D. (2003). Does marijuana use cause the use of other drugs. *Journal of the*

American Medical Association, 289(4), 482-483.

Kandel, D.B., Yamaguchi, K., & Chen, K. (1992). Stages of progression in drug involvement from adolescence to adulthood: Further evidence for the gateway theory. *Journal of Studies on Alcohol & Drugs*, 53(5), 447-457.

Keane, H. (1999). Adventures of the addicted brain. *Australian Feminist Studies*, 14(29), 63-76.

Keane, H. (2002). *What's wrong with addiction?* Melbourne: Melbourne University Press.

Keane, H. (2013). Making smokers different with nicotine: NRT and quitting. *International Journal of Drug Policy*, 24(3), 189-195.

Klesges, L.M., Johnson, K.C., Somes, G., Zbikowski, S., & Robinson, L. (2003). Use of nicotine replacement therapy in adolescent smokers and nonsmokers. *JAMA Pediatrics*, 157(6), 517-522.

Korhonen, M. (1997). Gateway drugs. *The Gazette*, July 5, B4.

Kozlowski, L.T., O'Connor, R.J., Edwards, B.Q., & Flaherty, B.P. (2003). Most smokeless tobacco use is not a causal gateway to cigarettes: using order of product use to evaluate causation in a national US sample. *Addiction*, 98(8), 1077-1085.

Latour, B. (1987). *Science in action: How to follow scientists and engineers through society*. Cambridge, MA: Harvard University Press.

Latour, B. (2007). *Reassembling the social: an introduction to Actor-Network-Theory*. Oxford: Oxford University Press.

Law, J. (2009). Actor Network Theory and material semiotics. In B.S. Turner (Ed.), *The new Blackwell companion to social theory* (pp. 141-158). Hoboken, NJ: Wiley-Blackwell.

Lee, S., Grana, R.A., & Glantz, S.A. (2013). Electronic cigarette use among Korean adolescents: a cross-sectional study of market penetration, dual use, and relationship to quit attempts and former smoking. *Journal of Adolescent Health*, early view form.
<http://dx.doi.org/10.1016/j.jadohealth.2013.11.003>

Limb, M. (2013). EU policy on e-cigarettes is a “dog’s dinner,” says UK regulator. *British Medical Journal*, 347, f6871.

Louiselle, P. & Whitehead, P.C. (1971). Scaling drug use: an examination of the popular wisdom. *Canadian Journal of Behavioural Science*, 3(4), 347-356.

Luik, J. C. (1996). ‘I can’t help myself’: Addiction as ideology. *Human Psychopharmacology*, 11, S21–S32.

Massing, M. (1996). Reefer Madness strikes again. *The New York Times*, August 27, 17.

McCullough, L. (2011). The sociality of smoking in the face of anti-smoking policies. In K. Bell, D. McNaughton & A. Salmon (Eds.), *Alcohol, tobacco and obesity: Morality*,

mortality and the new public health (pp. 132-145). London: Routledge.

Melikian, A.A. & Hoffman, D. (2009). Smokeless tobacco: a gateway to smoking or away from smoking. *Biomarkers*, 14(S.1), 85-89.

Morgan, L. (1997). Statistics link smoking, drug addiction. *St Petersburg Times*, March 27, 5B.

Morral, A.R., McCaffrey, D.F., & Paddock, S.M. (2002). Reassessing the marijuana gateway effect. *Addiction*, 97, 1493-1504.

Oetting, E.R. & Beauvais, F. (1986). Peer cluster theory: Drugs and the adolescent. *Journal of Counseling and Development*, 65, 17-22.

Patton, G.C., Coffey, C., Carlin, J.B., Sawyer, S.M., & Lynskey, M. (2005). Reverse gateways? Frequent cannabis use as a predictor of tobacco initiation and nicotine dependence. *Addiction*, 100, 1518–1525.

Pearson, J.L., Richardson, A., Niaura, R.S., Vallone, D.M., & Abrams, D.B. (2012). e-cigarette awareness, use, and harm perceptions in US adults. *American Journal of Public Health*, 102(9), 1758-1766.

Pepper, J.K. & Brewer, N.T. (2013). Electronic nicotine delivery system (electronic cigarette) awareness, use, reactions and beliefs: a systematic review. *Tobacco Control*, early view form. doi:10.1136/tobaccocontrol-2013-051122.

Pepper, J.K., Reiter, P.L., McRee, A-L., Cameron, L.D., Giley, M.B., & Brewer, N.T. (2013). Adolescent males' awareness of and willingness to try electronic cigarettes. *Journal of Adolescent Health, 52*(2), 144-150.

Peretti-Watel, P. (2011). Epidemiology as a model: Processing data through a black box? In G. Hunt, M. Milhet & H. Bergeron (Eds.), *Drugs and culture: Knowledge, consumption and policy* (pp. 53-70). Surrey: Ashgate.

Peretti-Watel, P. & Moatti, J-P. (2005). Understanding risk behaviours: How the sociology of deviance may contribute? The case of drug-taking. *Social Science & Medicine, 63*, 675-679.

Reid, L.W., Elifson, K.W. & Sterk, C.E. (2007). Ecstasy and gateway drugs: Initiating the use of ecstasy and other drugs. *Annals of Epidemiology, 17*(1), 74-80.

Room, R. (2005). Stigma, social inequality and alcohol and drug use. *Drug & Alcohol Review, 24*, 143-155].

Rudin (2012). LinkedIn: The gateway drug to social media for financial services and others. *Huffington Post*. http://www.huffingtonpost.com/april-rudin/linkedinthe-gateway-drug-_b_1337245.html (accessed 10 December 2013).

Schissler, H. (1989). Alcohol lurks as a gateway to other drugs. *The New York Times* October 22, 36.

Sexandthestate.com (2013). I looked at porn (studies) for science.

<http://sexandthestate.com/i-looked-at-porn-studies-for-science/> (accessed 28 January 2014).

Shiffman, S., Gitchell, J., Pinney, J.M., Burton, S.L., Kemper, K.E., & Lara, E.A. (1997). Public health benefit of over-the-counter nicotine medications. *Tobacco Control*, 6(4), 306-310.

Shiffman, S. & Sweeney, C.T. (2008). Ten years after the Rx-to-OTC switch of nicotine replacement therapy: What have we learned about the benefits and risks of non-prescription availability. *Health Policy*, 86, 17-26.

Shiner, M. & Newburn, T. (1997). Definitely, maybe not? The normalization of recreational drug use amongst young people. *Sociology*, 31(3), 511-529.

Siemaszko, C. (1996). It's about time, cig foes say. *Daily News*, August 22, 2.

Sifanek, S.J. & Kaplan, C.D. (1995). Keeping off, stepping on and stepping off: the steppingstone theory reevaluated in the context of the Dutch cannabis experience. *Contemporary Drug Problems*, 22, 483-512.

Sims, C. & Brogan, P. (1996). Tobacco bat hit as Clinton acts on smoking. *The Herald*, August 23, 26.

The Week (2013). E-cigarettes: a gateway to nicotine addiction?

<http://theweek.com/article/index/249619/e-cigarettes-a-gateway-to-tobacco-addiction>

(accessed 10 November 2013).

Timberlake, D.S., Huh, J. & Lakon, C.M. (2009). Use of propensity score matching in evaluating smokeless tobacco as a gateway to smoking. *Nicotine & Tobacco Research*, 11(4), 455-462.

Tomar, S. L. (2003). Is use of smokeless tobacco a risk factor for cigarette smoking? The U.S. Experience. *Nicotine and Tobacco Research*, 5(4), 561-9.

Urbangospelmission.com (2012). The porn gateways.

<http://urbangospelmission.com/the-porn-gateways/> (accessed 15 December 2013).

van Bilson, H. & Wilke, M. (1998). Drug and alcohol abuse in young people. In P. Graham (Ed.), *Cognitive behaviour therapy for children and adults* (pp. 246-261). Cambridge: Cambridge University Press.

Vanyukov, M.M., Tarter, R.E., Kirillova, G.P., Kirisci, L., Reynolds, M.D., Kreek, M.J., et al., (2012). Common liability to addiction and 'gateway hypothesis': Theoretical, empirical and evolutionary perspective. *Drug & Alcohol Dependence*, 123S, S3-S17.

Viveros, M-P., Marco, E.M., & File, S.E. (2006). Nicotine and cannabinoids: Parallels, contrasts and interactions. *Neuroscience & Behavioral Reviews*, 30, 1161-1181.

Weber, M. (1985). 'Gateway Drugs,' 'High-Tech Fitness'. *The Washington Post*, H20.

Wickelgren, I. (1997). Marijuana: Harder than thought? *Science*, 276(5321), 1967-1968.

Wilkie, C. & Blumenthal, P. (2013) Video game lobby steers gun violence debate away.
Huffington Post.

http://www.huffingtonpost.com/2013/04/09/video-game-lobby_n_3046533.html

(accessed 15 December 2013).

Zinberg, N.E. (1986-1987). Breaking the impasse in the War on Drugs: a search for new directions. *Nova Law Review*, 11, 901-908.