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From gateways to multilinear connections: A qualitative longitudinal investigation of the relationships between vaping and smoking among adolescent users¹

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Abstract

Background

The international growth of e-cigarette use has been accompanied by a corresponding concern that e-cigarettes will act as a 'gateway' to smoking and the use of other drugs. Taking these concerns as our point of departure, we explore the relationships between vaping and smoking among a cohort of young people.

Methods

Qualitative longitudinal methods with a diverse sample of 36 14–18-year olds from the UK city of Leicester. A total of 66 depth interviews conducted across two phases separated by 6–12 months. The interviews were recorded, transcribed verbatim and thematically analysed.

Findings

We highlight a complex 'tangle' of connections between substances/risk behaviours recounted to us by our adolescent study participants, including multiple and multilinear relationships between vaping and smoking. These findings problematise some of the core axioms of the notion of gateways as an explanatory model of causality and sequential connection between smoking and vaping. They also throw into question gateway logics more fundamentally. While many of our study participants themselves consciously invoked ideas of 'gateway effects', the accounts they produced repeatedly disrupted the logics of connection (between e-cigarettes and smoking; one set of behaviours and another) presupposed in gateway theory and our own early lines of questioning. Accordingly, we explore how cultural understandings of gateway effects are invoked by users in accounting for their vaping and smoking behaviours, noting the potential influence of these ideas upon the very processes they are understood to apprehend.

Conclusion

Our findings suggest there is a case to be made to reinforce the distinctiveness of tobacco and e-cigarettes in the life-worlds of young people to avoid naturalising a 'gateway' logic of connection that might ultimately inform the associative logic of young users themselves, and potentially the development of their usage careers.

Keywords

Gateway theory, trajectories, adolescents, e-cigarettes, smoking, logics of connection

Introduction

The international growth of e-cigarette use has been accompanied by a corresponding concern that the practice poses the threat of an emerging generation of nicotine-addicted youth (Kozlowski and Warner, 2017; Hallingberg *et al.*, 2020). Core to this alarm is the partly unknown long-term consequences of e-cigarette use itself (Bullen *et al.*, 2013; Fairchild and Bayer, 2015; Dinakar and O'Connor, 2016; Simmons *et al.*, 2016) and particularly the notion that e-cigarettes will act as a 'gateway' to smoking and hence a far more harmful source of nicotine (Chapman *et al.*, 2019; Lee *et al.*, 2019; Aladeokin and Haighton, 2019; Nkansah-Amankra, 2020).

The proposed gateway of e-cigarettes to combustible tobacco is posited through their potential to 'renormalise' smoking (see Measham O'Brien and Turnbull, 2015; Sæbø and Scheffels, 2017; Hartmann-Boyce, Begh and Aveyard, 2018), as well as to foster nicotine dependence in young people (e.g. Kandel and Kandel, 2014), leading them to take up smoking and possibly other drugs such as cannabis (e.g. Temple *et al.* 2017) when they might not otherwise have done so (Primack *et al.*, 2015; Barington-Trimis *et al.*, 2016; Soneji *et al.*, 2017; see also the analyses of Brown *et al.*, 2020; Kim and Selya, 2020). Here, young people are at once understood as potentially the vulnerable targets of harm by e-cigarette vendors and the tobacco industry, yet simultaneously as the potential promulgators of a future nicotine-addiction pandemic — as simultaneously prospective 'angels and devils' (Valentine 1996). Accordingly, youth vaping has become *the* focus for many of the policy debates relating to e-cigarette regulation, harm reduction, and the prospect of gateway effects. This is particularly the case in the US, where such debates have focused on e-cigarette flavours and marketing tactics (e.g. the targeting of young people by JUUL Labs Inc.: see Willett *et al.*, 2019; Al Hamdani, Hopkins and Park, 2020), health scares (e.g. the EVALI² controversy: see, for instance, King *et al.*, 2020), and the role of restrictions (e.g. relating to age-related sale, flavours, promotion) including the potential

² The EVALI (E-Cigarette/Vaping Acute Lung Injury) controversy emerged in the US in 2019 after a series of cases of acute pulmonary injury following the vaping of particular substances, principally vitamin E acetate — a thickening agent used in illicit THC-containing liquids (see, for example, Blount *et al.*, 2020). Despite these cases being traced almost exclusively to the consumption of vitamin E acetate, they were widely reported as 'vaping deaths' in the popular media, generating widespread public concern about the practice of e-cigarette use more generally.

unintended consequences of particular policy measures and environments (e.g. Pesko and Currie, 2019; Tackett *et al.*, 2020).

However, many of the studies purporting to have found evidence of a gateway effect of e-cigarettes in smoking uptake among adolescents (e.g. Barrington-Trimis *et al.*, 2016; Chatterjee *et al.*, 2016; Soneji, 2017; Pierce *et al.*, 2021), typically tend towards the conflation of a temporal correlation between ever use of e-cigarettes and subsequent smoking uptake with its causation. Moreover, societal-level data from the past decade or more suggest a progression in the opposite direction from that anticipated by the gateway hypothesis: away from smoking and towards e-cigarette use (Levy *et al.*, 2019), with the UK in particular now experiencing amongst the lowest levels of teenage smoking since records began (ASH, 2019; Oldham *et al.*, 2020; NHS, 2019). Such macro trends might, however, be misleading with the possibility that e-cigarettes could present — as the UK's former Chief Medical Officer, Professor Dame Sally Davies suggested in 2015 — a 'ticking time bomb' leading to a potential future explosion of smoking rates among those young people currently using e-cigarettes. Recent meta-studies of e-cigarettes as a potential 'gateway' to smoking are in broad agreement that while a relationship evidently exists between vaping and smoking by youth, the precise character of this relationship remains unclear and requires more nuanced investigation (Chan *et al.*, 2020; Taylor and Boyce, 2020; Khouja *et al.*, 2021). What is needed, then, is depth understanding of the qualitative relationship between e-cigarette use and smoking, including the social, psychological and environmental conditions governing key transitions in use.

Directly addressing these concerns, this paper draws upon findings from a qualitative longitudinal Cancer Research UK (CRUK) funded study which centrally explored the trajectories of e-cigarette and combustible tobacco use in mid-to-late adolescence amongst young people in the UK. The study built conceptually and methodologically from earlier work in which Author A (XXXX) developed a process sociological model of tobacco-using 'careers' through a detailed qualitative study of young and middle-aged smokers. Building from this previous work, our use of the concept careers³ refers

³ The normative connotations of 'career' — typically used to describe employment trajectories — facilitate an engagement with substance use trajectories as actively produced, not passively 'followed', yet with an overall

to the interplay of social learning and social conditions in the development of substance usage trajectories. Extending this approach, our research sought to contribute to an emergent body of work exploring e-cigarette use ‘trajectories’ in a qualitative longitudinal (QL) manner (see, in particular, Notley *et al.*, 2020), including a specific focus on young vapers (see, notably, Tokle’s [2020] study of youth vaping in Norway). Our utilisation of a process sociological model of ‘careers’ allowed us to build upon these existing QL studies through highlighting the interplay between the development of individual user trajectories and broader social and cultural developments (Authors XXXX). This includes exploring the relationship between the general tendency among young people increasingly to regard vaping as a ‘passing fad’ (Tokle, 2020) — a finding supported by our own study — and important differences *between* members of the same youth cohorts in relation to their ‘investments’ (cognitive, material, affective, etc.) in continued and future vaping (Authors XXXX).

Our focus in the present discussion is upon the utilisation of this conceptual and methodological approach to exploring the temporal and sequential relationships between e-cigarette use and smoking anticipated by gateway theory. A core part of our study involved reframing gateway concerns through considering the question: ‘Under what conditions might e-cigarette use develop into smoking (and vice versa) in the careers of adolescent vapers?’. Early findings prompted us to rethink certain of the premises of this way of asking this question, and with it, some of the fundamentals of gateway theory. As we explore in the following, while many of our participants themselves consciously invoked ideas of ‘gateway effects’, the accounts they produced repeatedly disrupted the *logics of connection* (between e-cigarettes and smoking; one set of behaviours and another) presupposed in gateway theory and, indeed, our own early lines of questioning.

structure and direction of their own irreducible solely to individual plans, intentions and choices. In this sense, substance use, even compulsive dependence, can be understood as ‘achieved’, not simply through individual drug administration but through ‘people doing things together’ in a considerably broader sense (Becker, 1986; see also Author A, XXXX; XXXX; XXXX). Nonetheless, the timeframes of substance using careers, particularly among young people undergoing high rates of developmental change, typically entail shorter time-spans than the normative sense of the term might imply. Indeed, in certain cases, a few weeks proved to constitute a crucially important period of transition.

Using our study to illustrate key arguments, we discuss some the problems axiomatic to the notion of gateways as an explanatory model of causality and sequential connection. Accordingly, we examine the complex ‘tangle’ of connections between substances/risk behaviours recounted to us by study participants, including the multiple and multilinear relationships between vaping and smoking they describe. Furthermore, we consider the influence of the idea of gateways as a cultural trope invoked by users in accounting for their vaping and other behaviours, noting the potential ‘power effects’ (Foucault, 1980) of this idea upon the very processes it is employed to apprehend.

Background: The Emergence of Gateway ‘Theory’

As Bell and Keane (2014) observed, an immediate difficulty of examining or testing the ‘gateway hypothesis’ is that it is anything but a singular or coherent hypothesis or theory. Core ideas invoked by the term can be traced to a set of successive, but partly independent, developments in lay, academic, and policy discourse over several centuries. For instance, British physicians of the eighteenth century counselled against the use of tobacco not simply because of its own intrinsic dangers, but because it was understood to ‘dry out’ the user, prompting the subsequent consumption of alcohol (and consequently leading to intoxication) (Author A XXXX). In the US, the notion that the use of certain ‘softer’ drugs will lead to successively ‘harder’ drugs has been pivotal to drug policy since at least the 1930s; finding more explicit expression in, for example, pamphlets and campaigns of the 1960s warning about cannabis as a ‘stepping stone’; and debates in the 1980s about ‘gateway drugs’ integral to the *Just Say No* Campaign (Kandel, 2002: 3; Kandel, 1975; Bell and Keane, 2014: 46). The origins of ‘gateway theory’ can be understood to involve a cocktail of political constructs, scientific models, policy precepts, and lay understandings. Thus, the gateway hypothesis was born through its very expression as a hypothesis that collapsed an array of parallel and cognate ideas into a unified articulation (Bell & Keane, 2014: 46). Indeed, the enduring influence and significance of gateway theory arguably owes much to its uncertain genesis and polysemy, allowing it to be mobilised in the service of a range of political and social concerns. These include TV violence and violent crime; porn and promiscuity; gateway ‘beliefs’ and the spread of social movements, and, particularly over the past decade, e-cigarettes and smoking (van der Linden *et al.*, 2019; Bell and

Keane, 2014: 48–49) and possibly other drugs such as cannabis (Temple et al. 2017; see also Wong *et al.* 2020).

Core to gateway theory are three key ideas defining specific logics of connection: sequencing, escalation and hierarchy (Kandel, 2002: 3–15). Sequencing suggests a particular kind of connected progression in the development of individual substance usage pathways, where participation in the use of one kind of drug is likely to predict that of another (Etter, 2018). Such progressions in use are typically understood to follow a specific direction and order, involving trajectories of change centring on the logic of escalation. In turn, this escalation is conceived hierarchically: variously from ‘softer’ to ‘harder’ — from less to more risky, harmful, addictive, potent, or intoxicating substances and/or modes of usage (again, such classifications are employed differentially in the pursuit of varying political and epistemic priorities) (Kandel, 2002; Etter, 2018; Bell and Keane, 2014: 48). Significantly, where tobacco was once conceived as the ‘gateway drug’ common to almost every other form of substance use, this relationship has shifted over the past decade, with nicotine increasingly understood as a dangerously addictive drug in itself, and smoking progressively ‘denormalised’ (Bell *et al.*, 2010); so much so that reverse-gateways (e.g. from cannabis to tobacco smoking and e-cigarettes) have been posited and investigated (Bell and Keane, 2014: 50; Patton *et al.*, 2005; Weinberger *et al.*, 2020; Wong *et al.* 2020). The motor of such escalation underpinning the gateway effect involves manifold possibilities, for example: 1) drug A activates a neural pathway that leads to the appetite for drug B; 2) tolerance of drug A leads to an escalation of dose met by drug B; 3) use of drug A reduces the inhibition to try drug B; 4) use of drug A engenders the social conditions (e.g. mixing in different circles to obtain supply and/or (re)normalising the use of certain substances) which leads to a greater likelihood of using drug B (see, variously, analyses by Vankuyov *et al.*, 2012; Kandel and Kandel, 2014; Philips, 2015; Etter, 2018; Chapman, Bareham and Maziak, 2019).

Our early analyses and emergent findings required us fundamentally to rethink every aspect of this gateway model and, indeed, its imprint upon the questions with which we originally commenced the study. It is not simply that we found little evidence to support the idea that e-cigarette use led to smoking, but that the notion of one drug escalating to another in temporal sequence involves a Humean regularity or ‘billiard

ball' model of causality/association that is ill-suited to understanding the substance use trajectories of young people as recounted to us by our adolescent participants. Instead of finding e-cigarette use and smoking as sequentially connected in a manner akin to 'balls in a line', we encountered multiple and multi-directional connections between these practices as part of a multifaceted whole comprising risk behaviours, consumption, youth, experimentation, and a wide array of social complexities — gender, ethnicity, and social class among them. Equally, however, we found conceiving of smoking and vaping as somehow entirely unrelated (sequentially or otherwise) as also implausible. Accordingly, our analyses and findings have sought to understand the qualitative character of the manifold relationships involved in youth vaping and smoking as narrated to us by our adolescent research participants. Our focus below, therefore, is on exploring how these necessitated a fundamental rethinking of gateway logics of connection in our study and our ongoing analyses.

Methods

Consistent with our interest in exploring the temporal and sequential relationships between e-cigarette use and smoking, we adopted qualitative longitudinal (henceforth QL) research methods to facilitate an engagement with processual dynamics through an in-depth qualitative approach to researching with participants. As Neale (2018: 1) has argued, 'QL research is conducted through time; but it also engages with the temporal dimensions of experience, opening up the potential to "think dynamically" in creative, flexible and innovative ways'. Accordingly, our study was longitudinal in both form and focus with, for example, interviews designed to elucidate orientations towards past, present and future use across two phases of interviews separated by 6–12 months.

Sample

There were particular challenges to the recruitment of participants to our study that parallel low levels of regular e-cigarette use amongst young people nationally (recent figures for 11–18-year olds in Great Britain indicate, respectively, 15.4% ever use, 4.9% current use, and 1.6% regular use (i.e. more than once per week) (ASH, 2019)). Our focus was to recruit participants who identified as current e-cigarette users (used within the past month), with the possibility of these users having used combustible tobacco before, after, or concurrent with their vaping (see below). A total of 36 young

people between the ages of 14–18 were recruited from a diverse cross-section of schools, colleges, youth councils, youth organisations, sports and leisure clubs across Leicester city and Leicestershire. The diversity in the sample and recognising developmental difference across 14–18-year olds, meant that this sample size was necessary to sufficiently achieve both coding and meaning saturation (Hennink *et al.*, 2017), to assure sampling adequacy and to sustain depth in data across both time stamps. The study built out of existing contacts and partnerships with stakeholder organisations, including schools and youth organisations involved in our previous projects funded by the Wellcome Trust and Leicester City Council.

The city of Leicester has a population of approximately 360,000 with roughly 510,000 in the wider Leicester Urban Area. Leicester is one of the most diverse cities in the UK, with approximately 50% of its population declaring as BAME in the 2011 census. It also has considerable socio-economic diversity, with 20% of neighbourhoods in Leicester among the most deprived 10% in the UK (Leicester City Council 2019). Consistent with the qualitative, exploratory character of the research, we sought to obtain a sample comprising a broad social distribution of participants consistent with the more general diversity of Leicester. Accordingly, a strength of our sample was its SES diversity: 18 of the 36 participants identified as belonging to BAME groups (9 Asian British Indian, 3 Asian British Pakistani, 1 Other Asian British, 5 Mixed/Multiple), 14 identified as female, 22 as male and, consistent with the SES composition of the populations from which we drew our sample, roughly 50% were from some of the most socioeconomically disadvantaged communities in the UK (including the Quintile 1 LSOAs of New Parks, Crown Hills and Braunstone [Leicester City Council 2019]). Of the 36 young people in our study, just under half (17) were regular (more than once per week) e-cigarette users, 12 were frequent (more than once per day) users, the remainder were more sporadic experimenters. At the point of recruitment, the majority (30) of participants identified as sole e-cigarette users, though the Phase 1 interviews identified that many (29) had smoked at least once before (25) or after (4) having first used e-cigarettes. These numbers remained the same at Phase 2. It also emerged in the Phase 1 interviews 3 participants identified as ex-users, but had not ruled out subsequent use in the future. At both Phase 1 and 2 interviews, we asked whether users were currently or previously using nicotine-containing liquids, and solicited details of solution strength, wattage, and flavours where such details were

forthcoming. There were marked differences between participants in their capacity to provide such specifics, particularly in relation to past use where issues of memory recall and/or uncertainty were sometimes significant.

Techniques

A total of 66 depth interviews were conducted across the two Phases, 36 in the first round and 30 in the second round, with 6 participants withdrawing by the second phase, typically because they had moved colleges/schools and were at key points of transition impeding their availability for follow-up. Interviews made use of elicitation aids — newspaper headlines⁴, website screenshots, statements about personal smoking/vaping — and typically lasted for one hour, with the longest taking 3 hours. Interviews were conducted by Author B and Author E in two phases, with between 6 and 12 months between the first and second. Between interviews, contact was maintained via WhatsApp.

Ethics

Alongside securing University research ethics approval, Author B, undertook a programme of consultation with the schools, colleges and other organisations to establish best recruitment and access methods, and to optimise attention to general as well as local safeguarding measures and protocols. Author B provided presentations at school/college assemblies, group meetings, and distributed project information to prospective participants via intranet announcements, leaflets, and letters to parents. Following this, participants completed an online survey containing basic questions about use, demographics, and willingness to be interviewed. Participants were able to self-exclude by not completing the survey or indicating unwillingness to be interviewed. After negotiating with stakeholder organisations, and through consultation with existing research in this area (see, for example, Resnick 2015) we determined a nominal level of incentives for participants, mitigated through a consistent emphasis throughout the study upon voluntary consent at all levels (Seymour 2012); a £20 Amazon voucher on completion of the phase 1 interview, and a £30 voucher for phase 2. We engaged in a continuing process of ethical reflexivity

⁴ Such story headlines varied, but included messaging such as ‘E-cigarettes more dangerous than smoking’; ‘Flavouring in e-cigarettes linked to popcorn lung’; ‘E-cigarettes safer than smoking’, etc.

adopting a 'stakeholder' model of research ethics (Neale and Hanna, 2012; Author C and XX, 2020). Accordingly, reflexivity was multi-directional focusing on the various interests and needs of the different stakeholders involved in the study (e.g. participants, researchers, gatekeepers) informing, for example, settings, room types, and timings for interviews. All stakeholders received a copy of the interview guide in advance. We also debriefed with stakeholder organisations post-interview, and retained contact with participants between interviews using the platform WhatsApp. WhatsApp provided a channel for participants to ask questions before and after interviews, and proved an effective means of sample retention. A team-centred ethical safeguarding policy was developed concerning both interview and WhatsApp communications. However, no concerns were raised during the fieldwork.

Prior to interview, participants were emailed an information sheet and consent form. For those under 16, this included forms to be completed by a parent/guardian on an opt-in basis. Interviews were conducted between February 2018 and August 2019. Given the potentially illicit character of some behaviours discussed⁵, consent was renegotiated at each sweep of data collection through strategies of 'refresh and remind' (Neale and Bishop, 2012). Interviews were conducted in situ within rooms agreed with stakeholder organisations and participants. They were digitally recorded, transcribed, anonymised and participants given pseudonyms.

Analytic Approach

Although two rounds of interviews at distinct phases were planned, access to different schools, colleges and groups proceeded at different rates. Consequently, interviews over the 18-month active fieldwork phase of the study involved some second-round interviews overlapping with the first-round interviews of other participants. Nevertheless, participants' interviews were separated by a 6–12-month gap to provide for the longitudinal interrogation of continuity and change. Interviews were semi-structured, with questions developed through interrogation of the literature, and dialogue with key stakeholders. The interviewers used open-ended question strategies supporting the co-production of interview narratives to allow participants to

⁵ Since October 2007, the legal age to purchase cigarettes in the UK is 18, and, since October 2015, 18 for e-cigarettes and nicotine containing vapour products.

narrate experiences in their own language, and extend or depart from the open questions comprising the interview schedule.

Analyses combined ‘deductive’ elements — in particular, investigating the potential sequential relationship between the use of e-cigarettes and combustible tobacco — and inductive, exploratory elements involving an iterative ‘two-way-traffic’ between theory, questions, concepts and evidence (Author A XXXX; Author C *et al.* XXXX). Consequently, in a first stage of analysis, the team analysed transcripts, formulated (and reformulated) questions relevant to the second phase interviews, and developed an emergent coding framework in which the more proximal insights and identification of codes of the interviewer (variously Author B or Author E) were brought into ‘analytic conversation’ (Author C *et al.* XXXX) with the more distal observations and reflections of other members of the team (principally Authors A, C, and D). This crucial stage engendered a reflexive dialogue between and across the team regarding the relationship between their research engagement and the emerging evidence. This prompted us to revisit some of our own assumptions about, for example, the normative relationships between e-cigarettes and tobacco, which (we found) differed across the team, and, as we shall demonstrate below, served to problematise some of the more fundamental axioms embedded in gateway theory and our own thinking. In a second stage of analysis, using Nvivo, the team engaged in a process-oriented thematic content analysis of the whole dataset (Author C XXXX). Here, consistent with our conceptual and methodological starting points, our analyses considered consistencies, divergences, continuities and/or changes in understandings, uses and experiences of e-cigarettes, tobacco and other substances/behaviours including participant-drawn contrasts and connections between these. In this phase, within-case analysis was undertaken to understand trajectories, changes and continuities for individuals, alongside cross-case comparison to facilitate broader analyses of the longitudinal dynamics of e-cigarette use and smoking across the sample. The coding framework developed iteratively in the first phase of analysis was further articulated and refined through our exploring and, as a research team, reconciling competing individual readings of the data ‘going in’ and ‘coming out’ (Author C *et al.* XXXX).

Limitations

The use of incentives, while principally intended to boost recruitment and reduce longitudinal attrition, is likely to have influenced participant self-selection and sample representativeness (Henderson *et al.* 2010). Additionally, our sample size and the non-random character of the recruitment strategy meant we are unable to draw broad generalisations from the study, either about the total population or particular demographic groups. In presenting our findings, therefore, we focus on the contrasts and differences *within* our sample; including how our participants' accounts variously serve to disrupt and call into question certain of the underpinning assumptions of gateway theory, and indeed the modes of questioning with which we commenced the study.

Findings

Assumed Logics of Connection

Our open-ended reflective interviewing design allowed for participant-driven and adolescent-focused narratives. From our early interviews it became apparent that our decision to enter the field with a specific focus upon e-cigarettes and tobacco use effectively 'produced' an assumed connection between those practices in as much as they were linked as topics for discussion at interview. By providing a degree of control to our participants in shaping the direction of the interviews, however, we soon found that aspects of that assumed relationship were not entirely shared by all the participants. It became clear that e-cigarette use and smoking were understood as part of a complex array of practices that extended to the use of a wide range of other drugs such as cannabis and cocaine, and encompassed risk behaviours such as sex, school rule transgression, and opposition to parents. Considering vaping and smoking in the same frame pre-supposes an understanding that these substances/practices and behaviours are closely associated — are of the same 'type' or 'order' (Foucault, 1980) — and thus sequential experimentation will be expressive in some way of this implicit connection. Indeed, the idea that tobacco and e-cigarettes are understood as more or less direct corollaries by young people underpins the gateway premise that the use of one will potentially renormalise and thus predict the use of the other (Hallingberg *et al.*, 2020, 208). Yet our early discussions highlighted how for many participants there were important categorical distinctions to be drawn between vaping and smoking which varied between users and shifted over the course of their careers. Such distinctions and connections, in turn, often linked to highly context-bound peer

understandings of the desirability or otherwise of particular practices and substances. For instance:

I: Okay—so you have never smoked, you just vape?’

P: No. I think smoking is disgusting, and we get...and people at our school get called ‘nittys’ for doing that, so...

I: Yeah, I’ve heard that a few times: what does it mean?

P: Just like trampy and...just something you don’t want to be.

I: Do you get called nittys for other things or is it just smokers?

P: Just smoking.

[Beth, 14, White-British, phase 1]

Here the negative designation of being a ‘nitty’ parallels a more general cultural stigmatisation and denormalisation of smoking (Bell *et al.*, 2010), but has its own specific connotations within the context of the participant’s school which centre on a negative identification ‘something you don’t want to *be*’, not simply a practice you do not want to *do*. Elsewhere this participant was clear that this was a highly gendered attribution:

P: You get called like a ‘nitty’ a lot and no, we don’t tell them [boys], or we don’t post it anywhere...they hate it [girls smoking]... boys don’t get called ‘nitties’, it is only girls ...I don’t think I will carry on really because like the boys...we don’t want the boys knowing.

[Beth, aged 15, White-British, phase 2].

Others within the same school recounted how boys who smoke were seen as ‘roadmen’, a similarly denigrative and stigmatised term with connotations of street delinquency and low social class, whilst also conveying an element of ‘roguish esteem’ within peer networks. Indeed, rather than expressing a uniform and unproblematic relationship, the connections and contrasts between smoking and vaping (and smokers and vapers) in our participants’ accounts often invoked complex intersections of ethnicity, gender, status and social class. For example:

I: So what made you want to try [vaping]?’

P: Because it’s like shisha init? Do you know what I mean?’

I: Okay and had you had that before?’

P: No I've never, I think shisha's minging [disgusting].

I: So if you think it's similar, what made you try vaping?

P: Because like, obviously, because I'm Muslim, init. Like so, shisha's like very culturally accepted — do you know what I mean? It's not like a druggy thing, it's not like smoking so like, I'm not bothered or get in trouble for it so.

[Zuber, aged 16, Mixed Ethnicity, phase 1]

Here, the close corollary of vaping is said to be shisha, not smoking, with the latter included alongside 'a druggy thing' — a practice linked to drug taking and/or as a drug itself — and as such, a practice not religiously or culturally acceptable within a Muslim community. The participant's discursive framing of vaping as a practice similar to shisha-use evidently formed part of an individual rationalisation: that it was more acceptable, less likely to attract scorn or trouble, and something for which he would not be 'bothered' (by parents or others in his community).⁶

Where Next?

Again, such accounts from the young people in our study serve immediately to disrupt some of the assumptions about sequencing (where next), escalation (why there next), and hierarchy (less/more) assumed in gateway arguments concerning e-cigarette use and smoking. These assumptions in part express elements of the historical development of combustible tobacco use and e-cigarettes. Indeed, our early reflections on emerging findings made the research team acutely aware of how, for us, e-cigarette use was implicitly understood as a development from tobacco use: an assumed *sequential* connection. This contrasted starkly with understandings of young people in our study for whom smoking and vaping had co-existed throughout their lives, more as *parallel* than sequentially-linked sets of practices and behaviours. This is not to say that young people in our study were ignorant of the relative novelty of e-cigarettes, the commonalities between smoking and e-cigarette use (e.g. that both could be understood as forms of nicotine self-administration), or that smoking could

⁶ A further complexity here is that, at the time we conducted the first phase of the research, second generation devices were still widely used and were frequently referred to as 'shisha pens' within the user groups we studied, irrespective of whether these were designed to emulate the experience of a water pipe or were simply pen-type e-cigarette devices used to vaporise conventional e-liquids. Again, this highlights the highly dynamic, context-bound understanding of e-cigarette devices and their use.

be understood as ‘worse’ (riskier, ‘harder’, less healthy) in a hierarchy that centres on harm. Rather, our participants’ accounts served to problematise the assumption — axiomatic both to gateway theory and indeed our own early modes of questioning — that smoking is where a user would automatically, inevitably, or even likely, ‘go’ after or before vaping.

For the young people in our study, their narrated basis for successive experimentation with e-cigarettes, combustible tobacco and other substances and practices — ‘where next’ — involved contrasting logics of sequential connection. ‘Where next’ was often presented not simply as a question of ‘which drug do I try next’, but, for example, ‘which risk/experience next’. And even that formulation is misleading, since developments in use were typically understood as not solely or even, in certain cases, partly driven by a succession of rational calculations or conscious choices. Neither, as we shall illustrate below, were such developments simply expressive of escalating nicotine dependence, nor indeed of an awakening of drug appetites, but as processes with complex dynamics involving an array of shifting sociocultural and biographical conditions.

For many young people, vaping formed part of a panoply of adventurous and experimental risk behaviours which were understood to be linked to generational specifics and transitions to adulthood. For instance:

I: Does vaping make you want to try other things?

P: I already had plans to try other things...I think [vaping] has kind of er made me want to try more things, like be more adventurous as a person. Because of trying it and comparisons, I think it has definitely made me...maybe it is just me personally, but more adventurous for trying new things. I would love to go and do a skydive, I would love to go Amsterdam and try the nightlife and things like that...I think a better way of explaining it is maybe it has prompted me to follow more of my life ambition, or things I want to try, because obviously for someone else they might have different ambitions, but taking that jump to trying vaping might prompt their own individual ambitions.

[Aidan, aged 17, White-Other, phase 1]

I: What made you come to the decision to try it, to give vaping a go?

P: Erm I think it's just...I'm just a really, like, a wild person. And I will try anything that's new, like, that's just me. I just wanted to, I was curious...I think when you are older you kind of vape because you are trying to stop smoking...But when you're young it's just like, it's like a phase: like loom bands, or whatever. It's just a thing that it's just normal in this generation. I don't think it should be, but...

[Akilah, aged 15, Other Asian, Phase 1]

Aidan includes vaping among a list of aspirational experiences: akin to skydiving, foreign travel and cosmopolitan nightlife. Significantly, he attributes 'taking the jump' to vaping to his becoming more open to other risk experiences. However, this attribution involves a particular connective logic — a sequential hierarchy not so much of 'softer' or 'harder' drugs, but of progressively expanding horizons, greater self-determination, personal achievements, the fulfilment of life ambitions. Similarly, the motor of 'escalation' is portrayed not solely as the appetite to try other drugs, but an increasing desire to experience more of what life has to offer. While experimentation with other drugs might well form part of this (his reference to Amsterdam, we later heard, also signalled a desire legally to try cannabis), it is by no means the principal axis of connection. Moreover, the desire to obtain those other experiences was not so much engendered by having vaped as reinforced by it: 'I already had plans to try other things...'.

Akilah, by contrast, positions vaping in a more age/phase-bound manner. Drawing a contrast frequently invoked by young people in our study, vaping among older people is said to be something done to stop smoking, by contrast, among 'this generation' vaping was often narrated as something to be tried, like loom bands. The comparison to loom bands is significant; it echoes similar parallels to fidget spinners by participants in Tokle's (2020) youth vaping cohort study and attests to the possibly faddish character of adolescent e-cigarette use among young people in the UK (Brown *et al.*, 2020). Loom band bracelet-making was a transient fad popular in the UK between 2014–2016. The connotations here are of something fleeting and innocuous — once fashionable, now passé — yet there is also an acknowledgement that such a comparison is problematic: 'I don't think it should be'. Elsewhere in the interview, this participant acknowledges the potential risks of vaping, and recounts a discussion with

her father who had told her that e-cigarettes could be 'worse than smoking'. Subsequently, this participant drastically reduced the frequency of her vaping, and eventually switched to shisha use which, again, was described as more acceptable within her (Muslim) family and community.

Complexities and Contradictions

Where our participants drew direct sequential connections between e-cigarette use and smoking, these typically involved complex developments and associations. In many such accounts, received understandings of the implicit logics of connection between tobacco use and vaping were simultaneously adopted and subverted, sometimes in ways that appeared inherently contradictory. Of the 26 participants in our study who had tried both e-cigarettes and combustible tobacco by the phase 2 interviews, all but four had tried smoking first. This afforded opportunities directly to discuss how the two practices were understood to be sequentially connected. For example, Usman, a 16 year old Asian male — a participant who had previously 'tried a puff of a cigarette' when he was 15 — alluded to there being important differences between his smoking and vaping. Picking up on these, we asked:

I: So talk to me about how your vaping is different [from when you tried smoking]?

R: I suppose I've always been told my whole life all the bad things and like directly giving raw information about how terrible cigarettes are, but how many times have you heard that about vaping? And obviously you do hear...I have heard bad things obviously, having it in my life, the people around me have told me bad things, and I am aware of the bad things. I mean vaping is not good potentially, but I've heard more good things than bad things, I mean that is not a reason to do it obviously, but...I suppose the way I got into vaping was nicotine. The big thing ... is how addictive it [nicotine] was and honestly me being careless, being young and I...I think I should make this clear as well that I don't do it a lot at all.

[Usman, aged 16, Asian British–Indian, Phase 1]⁷

The implication in this account is that his ‘one puff’ of a cigarette when he was ‘careless’ and ‘young’ formed part of a pathway involving progressive nicotine dependence; that he was attracted to vaping because he felt it to be safer source of nicotine, but has since come to realise that vaping too is harmful and is now an infrequent user. However, later in the same interview, and in the follow-up, this same user explained how a major part of the enjoyment was the thrill of engaging in a transgressive behaviour which also helped foster a sense of risky esteem among his peers. It also became evident that he later came to use only non-nicotine liquids. At his follow up, Usman had stopped vaping completely and expressed no intention to vape or smoke again. Viewed sequentially, employing the logics of gateway theory, we might falsely draw the conclusion that smoking led him towards vaping — a reverse gateway — and ultimately to never using nicotine in any form again. Of course, that would be a highly misleading and problematic understanding of the complexities of this user’s career. In the phase 2 follow up, when asked why he no longer vaped he responded, ‘I think it is just kind of... you just grow out of things really, I think being around the wrong people and it’s not really me’. The implication is that he had ‘grown out’, and socially moved out, of enjoying the thrill of risky experimentation that was associated with vaping — a sentiment echoed by several others during our study (see also Tokle, 2020; Brown *et al.*, 2020).

Like others in the study, this user narrated aspects of received understandings of vaping — as addictive, as potentially risky, as something young people try without being aware of the dangers — whilst simultaneously describing aspects of his own use and development that directly contradicted these ideas. Furthermore, it became apparent that many of our study participants were, at times, engaged in particular modes of biographical and narrative work at interview that involved drawing upon an established stock of cultural tropes relating to the similarities of smoking and vaping and indeed gateway theory itself. These included the idea that vaping is effectively ‘smoking without smoke’ (see Tokle and Pederson, 2019; Author, 2003), with

⁷ This example also attest to the considerable diversity in our participants’ understandings of the degree to which vaping is viewed as something potentially stigmatising. Usman’s account chimes with other participants who expressed concerns with the ‘addictiveness’ of e-cigarettes

participants accordingly seeking to demonstrate their own awareness of the potential future and current risks of e-cigarettes that had been highlighted to them by family members, teachers, and from a range of informational sources. Such narration partly involved a performative component (Lucherini, Rooke and Amos, 2018) consistent with interview talk more generally (see, for example, Whitaker and Atkinson; Authors XXXX). Thus, at times young people could be understood as engaged in demonstrating to interviewers that they had ‘received the messaging’, particularly from adults, on what were felt to be the common dangers of vaping and smoking. However, as those same interviews unfolded, participants would often utilise logics of connection between vaping and smoking that differed from those received from figures of authority. An oft-expressed tension was between the duality of vaping understood as simultaneously something *like* smoking and as an *alternative to* smoking (Sæbø and Scheffels, 2017):

In a way, it is difficult because I feel like, also like, a lot of my parents’ friends who used to be smokers: they’ve now switched back to vaping. So I think it can start for the younger people—start them off to smoking—whereas the older you get it kind of stops you from smoking. It is a bit of a weird one isn’t it?
[Kaileigh 18, White-British, Phase 1]

Again, this participant is demonstrating an awareness of the potential ‘gateway’ effects of e-cigarette use (albeit that in her own case she had smoked first and was presently vaping to cut down) that are seen to map on to somewhat contradictory generational contrasts: for ‘their’ generation it is something done to stop smoking, whereas for ‘ours’ it could be something you do to start smoking.

It’s All Connected

With the limitations of our sample firmly in mind it is perhaps significant that the bulk of our participants had tried smoking before vaping. Given this, adopting the sequential logic of a gateway-like connection (albeit a reverse one), we might have expected our participants to have made sense of e-cigarettes primarily through the prism of smoking. Indeed, echoing findings of earlier qualitative studies with young people (see, for example, Lucherini, Rooke and Amos, 2018) several of those who had

experimented both with tobacco and e-cigarettes would often conflate the two practices, referring, for example to having ‘smoked’ e-cigarette vapour. However, as we discuss elsewhere (Authors XXXX), by later phases of their usage careers, where experimentation had given way to more established and invested patterns of use, our participants typically were at odds to delineate smoking from vaping: in fact, received understandings of smoking and vaping as corollaries were characteristically ‘unlearned’ as use continued. These individual transitions parallel broader sociocultural transitions of vaping underway at the particular historical juncture at which we undertook the research. At this time, first generation ‘cigalikes’ were giving way to second and third generation devices. Even the terminology of ‘e-cigarettes’ (which invites a direct comparison and connection to combustible tobacco) was falling out of use, with our participants almost exclusively rejecting the term in favour of ‘vapes’, and the devices themselves variously referred to as (relative to different device generations), ‘disposables’, ‘pens’, ‘pods’, and ‘mods’.

Nonetheless, given the focus of our study, we were particularly interested in those participants (n. 3) who had tried e-cigarettes prior to their use of combustible tobacco. Of these, one participant’s developmental trajectory exemplified the connective logic we might anticipate based on gateway theory. At Phase 1, this participant was an occasional vaper, who had not tried smoking, and had recently gone for a protracted spell without vaping after his device had been confiscated by his school. When asked for his reflections on headlines from recent tabloid newspapers — one of which made explicit mention of gateways — he told us:

I am not sure about it, like e-cigarettes, they are not one puff away from a heart attack. I don’t think you just do one puff and die, otherwise someone would have died from one⁸. And erm...[pause] when it says ‘vaping is a gateway to tobacco’, I think it is...It could be, yes. But it is a very similar thing, so I am not sure why you would go through to that.

[Jamie, aged 15, White-British, Phase 1]

⁸ It is noteworthy that this account was collected before the EVALI controversy in the US (see earlier note).

Here the conventional logic — that if e-cigarettes and tobacco are seen as similar, one might respectively normalise and predict the use of the other — is effectively inverted: the implication is that it would make no sense to ‘go through’ to cigarettes given the contrasting risks of smoking and vaping. More generally at Phase 1, Jamie expressed no interest in trying combustible cigarettes. Yet by Phase 2, 12 months later, he was smoking regularly. When asked why he had switched from vaping to smoking he responded:

P: Well there was quite a big interval between, so now I don’t know the effects really... I only smoked [cigarettes] because my friends did...

I: So talk to me about why you think you stopped vaping?

P: Erm I’m not sure really. I just...I think it’s a bit stupid now...Because my one didn’t actually have any nicotine in it, so I just found it a bit pointless in the end ...around the time I started smoking I sort of had a new set of friendship groups...at the time I was going out with my friends, and I was smoking weed as well. So it’s all connected.

[Jamie, aged 16, White–British, Phase 2]

Expressed in these statements are multiple notions: that the ‘effect’ of vaping on subsequent smoking was difficult to gauge because of a protracted interval between his stopping one and commencing the other; that his former vaping was ‘pointless’ because it contained no nicotine (part of the ‘point’ of smoking for him); and that the key transition was not so much between vaping and smoking as between different social groups: transitioning into friendship groups where smoking both tobacco and cannabis were practised. While Jamie draws no direct sequential connection between his vaping and smoking, it is possible that his earlier vaping played a role in his subsequent smoking of tobacco and cannabis – providing an earlier model of ‘hand-to-mouth’ substance inhalation (Wadsworth *et al.*, 2016). That the practices could be somehow entirely unconnected is implausible, if only in as much as they all form part of the broader ‘landscape’ of substance use negotiated throughout this participant’s career. However, to reduce the complexities of this account to a tunnel vision focus on the sequential linkage between Jamie’s vaping and smoking is precisely to miss

the broader sets of relational 'connections' involved. Jamie's usage career involved considerably more than switching between the consumption of different substances. It centres on his simultaneous navigation of the complex interplay between the biographical transitions involved in adolescent development, his transitioning between friendship networks, his negotiation of the social landscape within and beyond his school.

The case of this participant serves to exemplify several key themes that we observed from across our sample relating to the interplay between user careers and broader social transitions. Paralleling several of the others in our sample, Jamie's school draws its intakes from one relatively affluent region of Leicester, and two of the most economically deprived, diverse communities in the UK. Accordingly, negotiation of friendship networks both within and beyond the school simultaneously entailed the negotiation of a differentiated nexus of class, gender, and ethnicity-related 'positions' and related substance-using 'dispositions' (see Thirlway, 2018). These negotiated positions and dispositions structured both opportunities and individual propensities to vape, smoke, use other drugs, and engage in other kinds of risk experience.

In Jamie's case, it is impossible to know whether or not he would have negotiated these 'connections', these networks of peers and practices of consumption, differently had he not at an early phase participated in others in which he had vaped. However, a cycloptic analytical focus on this earlier practice could in no direct or even partial way explain the broader sets of transitions underway in this participant's life of which his substance-using career formed an integral part. We would often enter interviews with an explicit focus on the sequential relationships between vaping and smoking, and (allowing ourselves to be steered by participants) leave having discussed a wide range of substance-using practices, risk behaviours, developmental transitions, and broader social complexities, all of which were presented as crucial to exploring usage trajectories. Indeed, our endeavours to reconstruct with participants the sequential order in which certain drugs were tried, certain practices engaged in, were often not simply difficult, but empirically problematic, perhaps even arbitrary in certain cases. This is because many of the young people in our study were engaged in the simultaneous use of multiple substances/practices, the sequential development of

which often did not follow a singular, unilinear direction, or hierarchical ‘escalation’ of the type anticipated by gateway theory.

Conclusion: The Social Life of ‘Gateways’

Taking recent debates on the possible gateway effects of e-cigarettes as a point of departure, we undertook qualitative longitudinal research into the usage trajectories of adolescent vapers. A core part of this undertaking involved reframing the question, ‘Are e-cigarettes a gateway to smoking?’ to one of, ‘Under what conditions might e-cigarette use develop into smoking (and vice versa) in the “careers” of adolescent vapers?’. Despite this reworking, we retained from the model of gateways a concern with the relationships between different substances and practices over time, and with it an assumed logic of sequential connection between e-cigarettes and their combustible ‘counterparts’. However, our participants’ accounts forced us to confront such assumptions, which differed markedly from their own. It is not only that some (but by no means all) participants drew categoric distinctions between e-cigarettes and combustible tobacco, but they also employed sequential logics of connection that problematised the idea that smoking is where one might logically ‘go next’ (or before) vaping. Instead, these participants located e-cigarettes within a complex array of multiply-connected experiences, substances and behaviours.

Even as a point of departure, then, a concern with gateways carries with it an orientation to sequential connection which itself serves as a kind of ‘epistemic gateway’ to an overfocus on specific substances as if, within them, they hold explanatory power about how and why people use them. Indeed, the very conceptual imagery of ‘gateways’ conveys the notion of diachronic unilinear ‘channelling’ — where one drug hypothetically opens the way to the next. This idea, that, effectively ‘one thing leads to another’ over time, albeit that other ‘factors’ or ‘liabilities’ variously intervene or confound this sequential connection, is, we have argued, ill-suited to understanding how substance use develops in the usage careers of the young people in our study. Rather than understanding e-cigarette use and smoking as sequentially connected in a manner akin to ‘balls in a line’, these practices are better understood as parts of a complex processual whole comprising risk behaviours, consumption, youth, experimentation, and a wide array of social complexities (gender, ethnicity, class among them) irreducible to its individual parts. As one participant himself observed

'it's all connected'. Instead of looking for gateways, we might instead investigate the multiple, multi-directional and multi-linear connections between various 'elements' of a user's career (e.g. transitioning between friendship networks, biographical developments, smoking, e-cigarette use, etc.).

The idea of gateways, nonetheless, has a kind of enduring 'social life' that extends beyond its employ as a scientific precept. Indeed, the empirical accounts produced with our participants attest to the presence of gateway tropes in their own thinking. However, we found that despite their familiarity with and invocation of gateway ideas, certain of these young users were able to apply their own reverse and counterintuitive logics to make sense of their own usage patterns. Sometimes participants were consciously aware of how their own ideas contradicted the connective logics of gateway theory, finding it difficult to reconcile these: 'It's a bit of a weird one isn't it?'. Notwithstanding such efforts, the cultural influence of gateway theory remains. Somewhat perversely, the more we focus — in headlines, policy circles, etc. — on the potential gateway relationship between e-cigarette use and tobacco smoking, the more we naturalise a connection that ultimately can inform the associative logic of young users themselves and, for some, potentially the development of their usage careers. Accordingly, our findings suggest there is a case to be made to reinforce the categorical distinctiveness and sequential disconnection of tobacco and e-cigarettes in the life-worlds of young people, as, to use the metaphor of one user, 'both forms of activity, but entirely different sports'.

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